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CHAPTER #ACS-MP-10

MEMORANDUM FOR   Susan Schechter
                            Chief, American Community Survey Office

From: David C. Whitford */signed/*
                            Chief, Decennial Statistical Studies Division

Subject: Testing a New Field of Degree Question for the American
                            Community Survey

Attached is the final report for the study of the Testing a New Field of Degree Question for the American Community Survey. This report summarizes the results from the 2007 ACS Content Test for the Field of Degree question.

If you have any questions about this report, please contact David Raglin (x34226).

Attachment: (Testing a New Field of Degree Question for the American Community Survey)

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Testing a New Field of Degree Question for the American Community Survey

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Test Objective: The 2007 American Community Survey (ACS) Content Test was designed to assess whether the ACS can reliably collect data on the field of a person's bachelor's degree. The inclusion of a field of degree question on the ACS was proposed to provide field of degree data annually for small levels of geography and to assist in building a sampling frame for the National Survey of College Graduates (NSCG).

Methodology (see sections 2 and 3)
- We tested two versions of a new question on field of bachelor's degree – categorical (n=15,000 addresses) and open-ended (n=15,000 addresses).
- Data were collected in all three ACS modes - mail, Computer-Assisted Telephone Interviewing (CATI), and Computer-Assisted Personal Interviewing (CAPI).
- The Content Follow-Up reinterview was conducted by CATI to test reliability by re-asking the same version of the field of degree question asked in the original interview followed by the other version.

Major Evaluation Measures and Decision Criteria

Comparability of 2007 ACS Content Test field of degree data to other sources (see section 6.1)
- Relative degree distributions are comparable to the 2003 NSCG data for both questions.
- Categorical version estimates of field of degree are nominally higher than the open-ended version and the 2003 NSCG estimates due to more reporting of multiple degree categories (Categorical: 13.0 percent; Open-ended: 6.4 percent; NSCG: 3.7 percent).

Field of degree item missing data rates (see section 6.2)
- The item missing data rate for the open-ended question (6.5 percent) is significantly higher than the rate for the categorical question (3.2 percent).

Reliability of field of degree estimates (see section 6.3)
- The open-ended question results in significantly more reliable estimates than the categorical question for most degree categories based on Gross Difference Rates and Indexes of Inconsistency, indicating more consistency in reporting for the open-ended question.
- The open-ended question is producing levels of inconsistency that are mostly in the low range, while the categorical question levels are in the low to moderate range.
- Reporting of multiple degree categories in the categorical question is the main reason for the difference in reliability.

Correspondence between field of degree question versions (see section 6.4)
- Using data from the reinterview only where people were asked the open-ended question followed by the categorical question, the agreement rate between questions is low (65.1 percent), indicating a problem for people in classifying degrees into the categories.
- This low rate is largely due to multiple degree category reporting in the categorical version.

Conclusions: The results favor the open-ended question with the exception of the item missing data rates. The over-reporting of multiple degree categories is a flaw in the design or administration of the categorical question, and may indicate difficulty in classifying degrees into the categories. Cognitive testing also found issues with multiple category reporting for the categorical question.

1. INTRODUCTION

The 2007 American Community Survey (ACS) Content Test, referred to as the Content Test throughout this report, was designed to assess whether the ACS can reliably collect data on the field of a person's bachelor's degree. The inclusion of a field of degree question on the ACS was proposed to provide field of degree data annually for small levels of geography and to assist in building a sampling frame for the National Science Foundation's (NSF) National Survey of College Graduates (NSCG). Two versions of a field of degree question were tested -- a categorical version and an open-ended version.

2. RESEARCH QUESTIONS AND DECISION CRITERIA

In an effort to determine which version of the field of degree question performed better, we identified evaluation measures and selection criteria before the test was fielded. These evaluation measures are similar to those used in the 2006 ACS Content Test.

This report answers the following questions:

- Are the relative estimates of science and engineering[1] degrees for each version of the field of degree question roughly comparable to existing data sources? Are the relative distributions of field of degree roughly comparable to existing data sources? (See section 6.1)

- Do the two versions of the field of degree question have different item missing data rates? Is the item missing data rate greater than 10 percent for either version? (See section 6.2)

- Which of the two question versions results in more reliable estimates (at equal levels of detail)? (See section 6.3)

- How well do field of degree responses correspond between the categorical and open-ended versions of the questions? (See section 6.4)

- How many more cases are identified as possible science and engineering graduates for the NSCG sampling frame using a combination of field of degree and occupation/educational attainment data compared to the current method of using just occupation/educational attainment data? (See section 6.5)

- Does the addition of the field of degree question change the item nonresponse rate for the educational attainment question that precedes the field of degree question? (See section 6.6)

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[1] Science and engineering degrees include those in biological, agricultural, physical, earth, or other natural sciences; health, nursing, or medical fields; engineering, computer sciences, or mathematical sciences; and psychology, economics, or other social sciences.

We used the selection criteria below to determine if field of degree could provide quality data from the ACS and if so, which version was superior in terms of performance:

- Criterion 1: If the field of degree percent distributions and percentage of degree holders who have science and engineering degrees were not relatively comparable to existing data sources, that version was considered unacceptable for the ACS.

- Criterion 2: We considered the item missing data rates and reliability, as measured by Gross Difference Rates and the Index of Inconsistency, together when determining which question version performed better.

- Criterion 3: Using data obtained in the Content Follow-Up (CFU) reinterview, we looked to see how well respondents were able to classify specific fields of degree into the response categories as intended. If data suggested that respondents misclassified degrees, it would be reasonable to assume that the open-ended version, which collected greater detail and did not ask the respondent to categorize a degree, was better assuming confidence in the coding system.

- Criterion 4: Since one goal of including a field of degree question on the ACS is to provide a better sampling frame of science and engineering graduates for National Science Foundation (NSF) surveys, we examined the potential change in the sampling frame. This information is presented so the Office of Management and Budget (OMB) can consider this when they make their decision on whether the field of degree question should be included on the ACS.

3. BACKGROUND

3.1 Why did we test a field of degree question on the ACS?

The NSF, working through the OMB Interagency Committee for the ACS, requested that the Census Bureau consider adding a question on field of bachelor's degree to the ACS. If collected, this information could assist in selecting sample cases for the NSCG. Specifically, NSF would like to use the field of degree information on the ACS to identify people with science and engineering degrees. The Census Bureau tests any proposed new questions or question revisions before implementing any changes in ACS production. Therefore, the Content Test was designed to assess whether the ACS can reliably collect data on the field of a person's bachelor's degree. Specifically, this test helped determine which of the two versions of the field of degree question tested, if either, could provide reliable estimates that are comparable to existing data sources.

In accordance with the *U.S. Census Bureau Policy on New Content for the American Community Survey*, the OMB will ultimately decide if a field of degree question is added to the ACS, and if so, which version. If added, the question would make its debut in ACS production in January 2009.

3.2 What were the two versions of the field of degree question we tested?

The wording of two versions of the field of degree question tested in the Content Test was based on findings from cognitive interviewing (Rothgeb and Beck, 2007). The cognitive testing report is shown in full in Appendix E. One open-ended version and two categorical versions, with differing category descriptions and number of categories, were cognitively tested. During cognitive interviewing, respondents said that it was difficult to classify a degree into one of the given categories. People with interdisciplinary single degrees such as Medical Biology, Agricultural Economics, and Biopsychology did not know whether they should mark all categories that applied or whether they were restricted to marking only one category. Also, respondents given the Computer-Assisted Telephone Interviewing (CATI) or Computer-Assisted Personal Interviewing (CAPI) versions of the categorical questions, where the categories were read one by one with a yes/no response required for each category, sometimes had trouble because they said "yes" to an earlier category but later decided another category fit better. In spite of these issues, we proceeded to field test a categorical version because coding costs would be much less than the open-ended question.

In the field test, we tested a categorical question with eight categories that asked the respondent to classify field(s) of bachelor's degree into a category or categories and an open-ended version in which the respondent listed the specific field(s) of bachelor's degree. Facsimiles of the questions and the preceding identical skip instructions on the paper form are shown in Figure 1.

Figure 1: Field of Degree Question Versions on Paper Form

The field of degree questions followed the questions on school enrollment and educational attainment. The skip instruction was intended to elicit a response to the field of degree question only for people reported to have a bachelor's degree or higher. Note that "BACHELOR'S DEGREE" was shown in all capital letters twice in each version to emphasize the degree of interest. See Appendix A for the final wording of the CATI and CAPI field of degree question versions used for this test.

4. METHODOLOGY

4.1 What was the basic test design?

The Content Test sample design mirrored, as closely as possible, the production ACS design to simulate the conditions under which the field of degree question may be administered. The Content Test consisted of a national sample of approximately 30,000 residential addresses in the continental United States. The test used a paired sample design. That is, when we selected an address, we also selected a nearby address, with one receiving the categorical version of the field of degree question (15,000 addresses total) and the other receiving the open-ended version (15,000 addresses total).

The Content Test followed the same schedule and procedures for the mail, CATI, and CAPI operations as the July 2007 ACS production panel. Questionnaires were mailed to sampled households at the end of June 2007. The Content Test used an English-only mail form but the automated instruments (CATI, CAPI, and Content Follow-up (CFU)) included both English and Spanish versions. Households not responding by mail and for which we had a phone number were contacted for a CATI interview during the month of August 2007. In September 2007, Census Bureau field representatives visited a sample of households that did not respond by mail or CATI in an attempt to collect the data. The CAPI operations ended October 1, 2007.

The full ACS implementation strategy was used for the test with the exclusion of the Failed Edit Follow-Up (FEFU) operation. The FEFU operation, in which households are contacted via a CATI operation to complete key data items left blank on their mail questionnaires, was excluded for cost-saving purposes and to analyze responses in their purest form. In addition, the Content Test purposely did not include any edit or imputation steps so as not to mask any response problems with either question version. A handful of respondents who called the Telephone Questionnaire Assistance (TQA) phone number provided on the mail questionnaires was excluded from analysis since the production TQA interview did not include the field of degree question.

Since both question versions had space for an open-ended response, we implemented a coding operation to classify all write-ins provided in the original interview and the CFU. Specifically, we adapted the NSCG coding system for the Content Test with some modifications to account for the fact that the ACS collects much less detailed degree data than the NSCG. The coding operation started with an autocoding operation, followed by clerical and expert coding. We

coded each write-in and then classified the degree into the eight categories from the categorical version for analytical comparison purposes.

4.2 What was the Content Follow-Up (CFU) reinterview?

About two weeks after we received a completed mail return questionnaire or completed CATI or CAPI interview, a responding unit entered the CFU operation. Telephone center staff completed the CFU interviews between July 17 and October 17, 2007. At the first contact with a household, CFU interviewers asked to speak with the respondent who completed the original interview (as listed on the mail questionnaire or in the CATI/CAPI interview). If that person was not available, interviewers scheduled a callback at a time when the original respondent was expected to be home. If, at the second contact, we could not reach the original respondent, interviewers completed the interview with an ACS eligible household respondent (a knowledgeable household member age 15 year or older).

In the CFU, we asked questions of all people identified as college graduates with a bachelor's degree or higher in the original data collection. The CFU reinterview did not replicate the full ACS interview. As figure 2 shows, a few housing questions were asked first to provide some context for the interview. Then, the five preceding person level questions were asked before asking the field of degree question two ways. First, respondents were asked the same version of the field of degree question they had been asked in the original interview. This gave us two measures of the same question, one from the original mail, CATI, or CAPI interview and one from the CFU. Immediately after that, we asked respondents the other version of the field of degree question. For example, if the household received the open-ended version in the original interview, they received the open-ended version in the CFU followed by the categorical version. Asking both versions of the field of degree question from the same person at the same time in the CFU allowed us to compare open-ended and categorical responses to determine if people place the degrees into the categories the way we intended.

5

Figure 2: Flow of the Content Follow-Up Interview
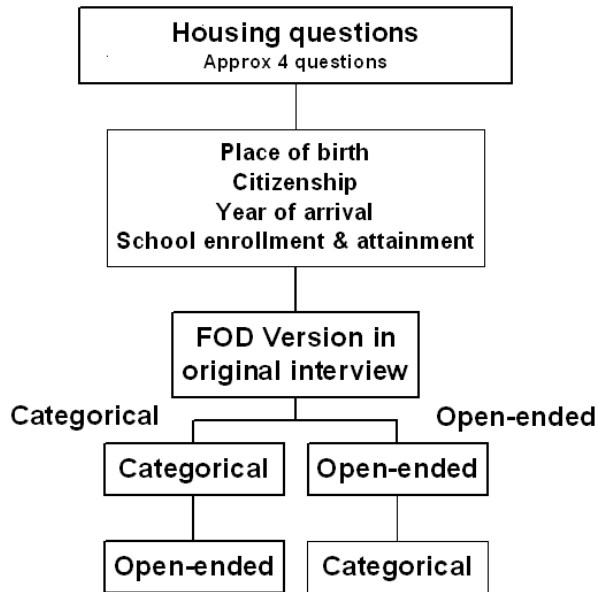
5. LIMITATIONS

While the Content Test maintained the same basic data collection methodology as the ACS, there are some aspects of the test implementation that should be considered in evaluating the data.

- The CFU was done entirely by telephone. The goal was to re-ask the same field of degree question as the original interview in the CFU. If the original data were collected by mail or CAPI, there was a difference in data collection mode that could account for some of the response variance. See Appendix A for the CATI, CAPI and CFU questions.

- Because the CFU was conducted by telephone, households that did not provide a phone number in the original interview were excluded from the CFU if we could not obtain a phone number from a vendor look-up.

- We did not have the same respondent in the CFU that we had in the original interview for about 14 percent of the CFU cases. This means that differences between the original interview and the CFU for these cases could be due in part to having different people answer the questions.

- As mentioned earlier, we did not edit the data that respondents reported, nor did we impute for missing responses. We also did not adjust the weights for unit nonresponse or to match known population totals, as is done with ACS production data. We purposely chose not to implement these adjustments in order to prevent masking any response problems either question version might have. This is a limitation in that the data cannot be easily compared to published data sources.

6. MAJOR RESULTS

This section provides the major findings for all questions associated with the decision criteria presented in section 2. Section 7 provides additional results to research questions that were not part of the decision criteria. All margins of error presented are at the 90 percent confidence level.

Since we observed no difference in the unit response rates between the categorical and open-ended questionnaires, for the original interview as well as the CFU, we are confident the findings presented in this report are not confounded by differing responding universes. The weighted unit response rate was roughly 97 percent for the categorical and open-ended versions of the questionnaire in the original interview. The unit response rate for the CFU was roughly 90 percent for both versions of the questionnaire.

6.1 Are the relative estimates of science and engineering degrees for each version of the field of degree question roughly comparable to existing data sources? Are the relative distributions of field of degree roughly comparable to existing data sources?

Yes, the relative estimates of persons with a science and engineering degree from the two field of degree question versions are roughly comparable to the 2003 NSCG estimate. Note that the estimates of Science & Engineering Degrees in Table 1 are the sum of categories 1, 2, 3, and 5. The table shows that the sum of those four science and engineering categories for the categorical version is 50.3 percent, 45.2 percent for the open-ended version, and 43.9 percent for the 2003 NSCG. Note that these comparisons are informal since no formal statistical testing between the Content Test and NSCG data could be done due to differences in data processing between the test and production data (i.e., the Content Test data were not edited or imputed, nor were there any adjustments for nonresponse or raking to known population totals).

Table 1 also gives the distributions of the percentage of people in each field of degree category. While the data are mostly comparable between the test questions and NSCG, there are some noticeable trends in the data. The percentages for the categorical version are nominally higher than the percentages for open-ended and the 2003 NSCG for many of the categories. The same holds true for the "Total" line of the table, which contains the sum of the percentages across the eight categories. The totals are all over 100 percent, meaning that some people were reported to have degrees in more than one category. The categorical figure of 114.4 percent is nominally higher than the 106.5 percent for the open-ended version and the 103.7 percent for the 2003 NSCG. This finding indicates that there was more reporting of degrees or majors in multiple categories in the categorical version than in the open-ended version or in the 2003 NSCG.

Table 1. Percent Distributions of Field of Degree
(Universe: People reported to have a bachelor's degree or higher)

	Response Distribution		
	Categorical (%)	Open-Ended (%)	2003 NSCG* (%)
Sum of Science & Engineering Degree Categories **	**50.3**	**45.2**	**43.9**
1. Biological, agricultural, physical, earth, or other natural sciences	10.8	9.9	9.3
2. Health, nursing, or medical fields	10.0	7.6	7.2
3. Engineering, computer sciences, or mathematical sciences	14.4	12.5	13.2
4. History, arts, or humanities	18.6	14.8	15.5
5. Psychology, economics, or other social sciences	15.2	15.2	14.2
6. Business or management	23.8	22.4	20.9
7. Education or education administration	17.7	14.0	15.2
8. Some other major field	4.1	10.1	8.2
Total	114.4	106.5	103.7

Missing data not included. Persons falling in more than one category are counted in each category.
* Data are fully weighted and edited. ** This row is the sum of categories 1, 2, 3, and 5.

While there are people with multiple bachelor's degrees or double majors that legitimately should be reported in more than one category, the intention was that each degree or major would go into one and only one category. The percentage of people who were in more than one category in the categorical version was about twice the percentage of those in the open-ended version (13.0 percent versus 6.4 percent[2]), a difference that is statistically significant. Both estimates are nominally higher than the 3.7 percent in the NSCG. Given that the multiple category reporting is lowest in the NSCG, we believe that the 13.0 percent figure for categorical is erroneously high.

We also looked at multiple category reporting for the categorical question by the mode used to collect the data in the original interview. We found that the rate of multiple category reporting for CATI (22.2 percent) was significantly higher than both mail (11.0 percent) and CAPI (14.4 percent), suggesting a potential mode effect[3]. Specifically, the categorical question in the CATI mode is more susceptible to multiple category reporting than the other modes. For the open-ended question, the multiple degree reporting rates were not statistically different by mode

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[2] A note of clarification: Given the "Total" presented in Table 1 for the categorical version was 114.4 percent and the open-ended version was 106.5, one may think that 14.4 and 6.5 percent of people, respectively, were reported to have degrees in more than one category. Instead, we report these percentages as 13.0 percent for categorical and 6.4 for open-ended.   The difference is that a very small percentage of people were reported to have degrees or majors in more than two categories.

[3] The comparisons of mail, CATI, and CAPI to each other used the Bonferroni method to adjust for the fact that multiple comparisons were being performed. There was with no difference between the mail and CAPI modes.

(CATI: 4.4 percent, mail: 6.3 percent, and CAPI: 7.7 percent). However, each of those figures is significantly lower than the corresponding rates for the categorical version. Appendix B (Tables B.1, B.2, and B.3) shows the percentage of people in each degree category broken out by mode.

Why was the multiple category reporting rate higher for CATI than the other modes for the categorical version? Recall that the categorical question in CATI/CAPI was asked as a series of "yes/no" questions. That is, this question was asked as eight separate questions, each requiring a "yes" or "no" response before proceeding to the next question. From cognitive interviewing of the CATI/CAPI instrument, we saw that people answered "yes" to a category but later found another category that was more appropriate (Rothgeb and Beck, 2007). We hypothesize that in a CATI interview, respondents may be reluctant to correct a previous response so multiple categories are left as "yes" responses. The face-to-face setting with personal interaction in a CAPI interview may make it easier for a respondent and interviewer to go back-and-forth to correct erroneous responses. For the mail version, there was nothing on the form to tell the respondent to place each degree or major into one and only one category, so the hypothesis is that people with interdisiplinary majors may have checked each box that could apply to the degree.

6.2 Do the two versions of the field of degree question have different item missing data rates? Is the item missing data rate greater than 10 percent for either version?

The item missing data rate is computed for people who reported having a bachelor's degree or higher for the educational attainment question. For the categorical version, an answer of "yes" to <u>any</u> of the seven specific categories or a write-in response to the "some other major field" category that was able to be coded using the NSCG coding schema is considered a response. For the open-ended version, only answers that could be coded are considered responses. The item missing data rate for the open-ended version is significantly higher than the categorical version. These results are not surprising given that other research has shown that open-ended questions tend to have a higher nonresponse rate than categorical questions (Chesnut *et al.*, 2007; Griffith *et al.*, 1999.) Neither version has an item missing data rate higher than 10 percent.

Table 2. Field of Degree Item Missing Data Rates
(Universe: People reported to have a bachelor's degree or higher)

Field of Degree	Categorical (%)	Open-ended (%)	Difference (%)	Margin of Error (%)	Significant
Item Missing Data Rate	3.2	6.5	-3.3	±1.0	Yes

We theorized that the higher rate for the open-ended version could be in part because respondents provided information that could not be coded, so we calculated a missing data rate that considered any answer to be a response. The missing data rate under that definition was still significantly higher for open-ended, 3.5 percent versus 1.9 percent for categorical, indicating that the open-ended question was less likely to get any response than the categorical question.

It is also important to remember that in the ACS production setting, these rates may be lower because some households are contacted to complete data items left blank on their mail questionnaires, which was not done for this test.

6.3 Which of the two question versions results in more reliable estimates (at equal levels of detail)?

Recall that in the CFU we re-asked the same version of the question that the household received in the original mail, CATI, or CAPI interview. The CFU gave us a second measure of the person's field of degree using the same question, and we used those data to help measure reliability.

To measure the reliability of the responses between the original mail, CATI, or CAPI interview and the CFU interview, we calculated the Gross Difference Rate (GDR) and the Index of Inconsistency (II) [4] for each degree category.

- The GDR is the percentage of inconsistent responses between the original interview and the CFU for each degree category. For example, in the original interview, if the respondent said the person had a biology degree but in the follow-up, the respondent did not mention biology, that would be an inconsistent response.

- The II is the percentage of the variance that is due to simple response variance for the given response category. Simple response variance is the measure of variability of responses to the same question between the original and CFU interview. As the Census Bureau's general rule, index values of less than 20 percent indicate low inconsistency, 20 to 50 percent indicate moderate inconsistency, and over 50 percent indicate high inconsistency.

Table 3a gives the gross difference rates for the combined category Science & Engineering degrees and for each of the eight individual categories. The table shows that for the combined category and six of the eight individual categories, the gross difference rate was significantly lower for the open-ended version than for the categorical version. For the other two individual categories, the difference was not significant. These results indicate that the open-ended version produced significantly more reliable results than the categorical version.

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[4] Gross Difference Rates and the Index of Inconsistency are calculated independently for each category, not each person. For example, if business and education are reported in the original interview and only business is reported in CFU, only the education category would have an inconsistent response for the GDR and II calculations since it was only reported in one interview.

Table 3a. Field of Degree Content Follow-Up Comparison Statistics – Gross Difference Rates
(Universe: People reported to have a bachelor's degree or higher who responded to field of degree in the original interview and CFU)

	Gross Difference Rate				
	Categorical vs. CFU (%)	Open-Ended vs. CFU (%)	Difference (%)	Margin of Error (%)	Significant
Science & Engineering Degrees	**10.5**	**6.1**	**4.4**	**±1.8**	**Yes**
Biological, agricultural, physical, earth, or other natural sciences	6.1	3.1	3.0	±1.0	Yes
Health, nursing, or medical fields	3.8	1.0	2.8	±0.7	Yes
Engineering, computer sciences, or mathematical sciences	3.5	1.9	1.6	±0.9	Yes
History, arts, or humanities	8.8	5.1	3.7	±1.3	Yes
Psychology, economics, or other social sciences	8.0	3.2	4.8	±1.2	Yes
Business or management	5.5	2.8	2.7	±0.9	Yes
Education or education administration	4.9	4.0	0.9	±1.0	No
Some other major field	3.2	4.2	-0.9	±1.0	No

Appendix C (Tables C.1, C.2, and C.3) compares the gross difference rates by mode. From these tables, we see that the open-ended version had mostly lower gross difference rates than the categorical version for all modes. The CFU was conducted entirely by telephone, so there may be a concern that for the original mail or CAPI cases, it may not be a true re-ask of the original question. However, Appendix C shows that the differences in the gross difference rates were nominally as high or higher for the CATI cases (receiving the same mode both times) than for the mail or CAPI cases.

Recall that when we compared the distributions between the two test questions and the NSCG data we had more people that reported degrees in more than one category in the categorical version than we did in the open-ended version and in the NSCG. To help determine whether multiple degree reporting contributed to the difference in reliability, we compared the gross difference rates using only people who were reported to have a degree in only one category in both the original interview and the CFU. The results are shown in Table 3b.

Table 3b. Field of Degree Content Follow-Up Comparison Statistics – Gross Difference Rates for Single Field of Degree Reporting
(Universe: People reported to have a bachelor's degree or higher in a single field of degree category in both the original interview and the CFU)

	Gross Difference Rate				
	Categorical vs. CFU (%)	Open-Ended vs. CFU (%)	Difference (%)	Margin of Error (%)	Significant
Science & Engineering Degrees	**5.0**	**4.6**	**0.4**	**±1.3**	**No**
Biological, agricultural, physical, earth, or other natural sciences	1.6	2.4	-0.8	±0.7	Yes
Health, nursing, or medical fields	1.7	0.7	1.0	±0.6	Yes
Engineering, computer sciences, or mathematical sciences	1.4	1.4	-0.0	±0.8	No
History, arts, or humanities	3.1	3.0	0.1	±0.9	No
Psychology, economics, or other social sciences	3.4	2.2	1.2	±0.9	Yes
Business or management	2.5	2.2	0.3	±0.8	No
Education or education administration	1.8	3.3	-1.5	±0.9	Yes
Some other major field	2.0	3.3	-1.2	±1.0	Yes

The major finding here is that the categorical version performed just as well as the open-ended version when restricted to this universe. The combined Science & Engineering category and three of the individual category differences are not significant, twice the open-ended is lower than the categorical, and three times the categorical is lower than the open-ended. This indicates that the difference in reliability between the categorical and the open-ended versions is largely due to people who are reporting multiple degree categories. In other words, not only does it seem that people answering the categorical version are over-reporting the number of categories, they are not replicating the multiple categories they originally reported.

As another measure of reliability, Figure 3 presents the indexes of inconsistency for Science & Engineering degrees and each degree category.   Instead of focusing on the differences for each category, with the Index of Inconsistency we generally look at the magnitude of the indices relative to the scale presented earlier. The line on the graph is the cutoff between the low and moderate levels of inconsistency (20 percent). For the open-ended version, you can see that the indices are in the low range (less than 20 percent) for almost all of the categories. For the categorical version, more than half of the indices are in the moderate range (20 to 50 percent), while the others are in the low range. This indicates the open-ended version again performs better on this reliability measure. A table with additional information can be found in Appendix D.

Figure 3. Field of Degree Content Follow-Up Index of Inconsistency
(Universe: People reported to have a bachelor's degree or higher who responded to field of degree in the original interview and CFU)
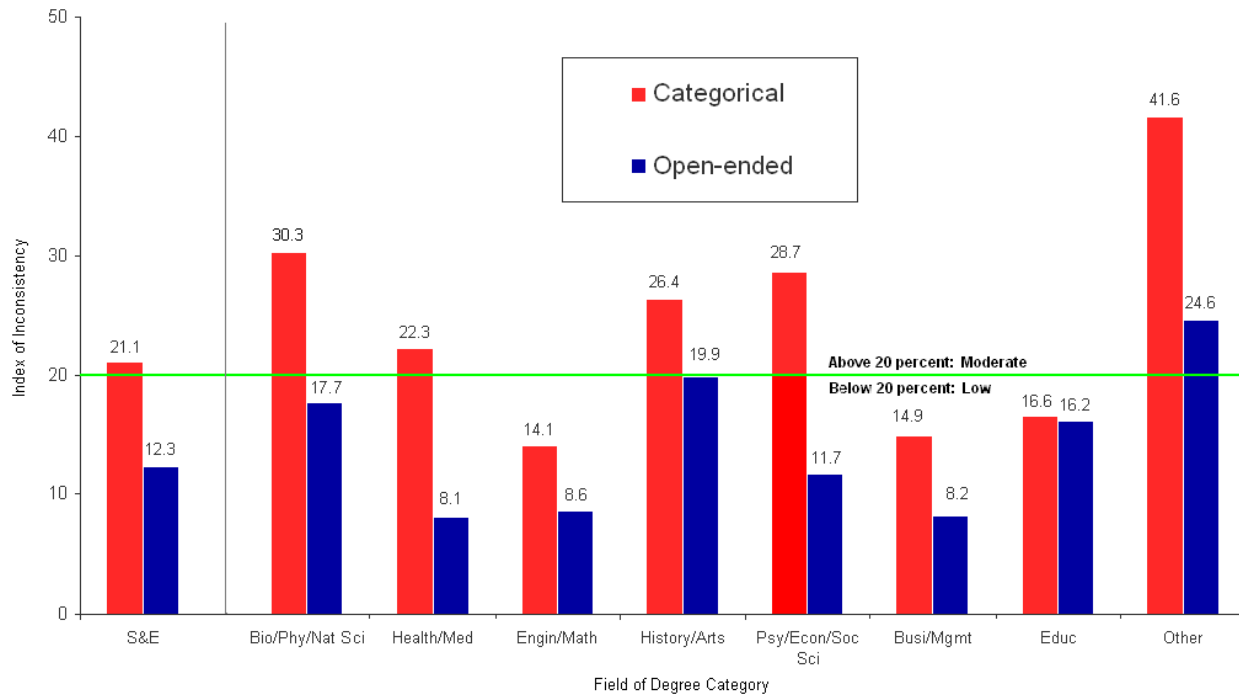
6.4 How well do field of degree responses correspond between the categorical and open-ended versions of the questions?

Recall that in the CFU, after we re-asked the same version of the field of degree question that the household originally received, we then asked the other version of the field of degree question. This gave us the opportunity to compare open-ended and categorical answers for the same person at the same time from the same respondent. For this analysis, we only used the cases that were asked the open-ended version first followed by the categorical version because we did not want the category names themselves to influence the open-ended answer given by the respondent.

Using these data, we calculated an agreement rate as the percentage where the open-ended response was coded to the same category or categories as reported in the categorical version. We found that this agreement rate was low (65.1 percent) indicating a problem for people in classifying the degrees. We noticed that a large number of the mismatches were situations where the category indicated in the open-ended response was also given in the categorical version, but additional categories were provided in the categorical versions as well (we created a category called "Agreement + additional categories" for those cases in table 4a). We found that 20.2 percent of all cases were in that category. The open-ended and categorical answers were totally different 12.5 percent of the time. The remaining 2.2 percent of the cases were more complicated partial match situations.

Table 4a. Person-level Agreement Status Between Categorical and Open-Ended Versions
(Universe: CFU people that received open-ended version followed by categorical)

	Percentage
Total Agreement – all open-ended responses match all categorical responses	65.1
Agreement + additional categories – all open-ended responses match categorical responses with additional categories marked	20.2
Total Disagreement – no open-ended responses match any categorical responses	12.5
Other – at least 1 open-ended response matches a categorical response and at least 1 open-ended response does not match a categorical response	2.2

As Table 4b shows, the categories that seem to have larger disagreement rates are "Biological, agricultural, physical, earth, or other natural sciences," "History, arts, or humanities," "Psychology, economics, or other social sciences," and "Some other major field." On the other hand, the total disagreement rate for "Education or education administration" is low, but quite often for the categorical version these people answered "yes" to another category, presumably in the person's specialized subject-matter field, as indicated by the high rate (30.0 percent) of "Agreement + additional categories" shown in column 2.

Table 4b. Degree-level Agreement Status Between Categorical and Open-Ended Versions
(Universe: CFU cases that received open-ended version followed by categorical)

	Total Agreement (%)	Agreement + additional categories (%)	Total Disagreement (%)
Biological, agricultural, physical, earth, or other natural sciences	64.7	18.0	17.3
Health, nursing, or medical fields	69.7	24.7	5.6
Engineering, computer sciences, or mathematical sciences	77.8	17.2	5.0
History, arts, or humanities	75.0	11.3	13.7
Psychology, economics, or other social sciences	55.0	30.9	14.2
Business or management	78.8	17.1	4.0
Education or education administration	65.3	30.0	4.7
Some other major field	20.8	9.2	70.0

Note: Categories are based on the open-ended response.

There are certain majors that illustrate the problems respondents had in classifying degrees. For example, we had 101 responses to the open-ended question indicating that the person had a political science degree and no other. Only half (52) of those people classified political science into the intended "Psychology, economics, or other social sciences" category. However, 37 respondents chose "History, arts, or humanities." The remaining 12 people chose other categories.

Another major with reporting problems was criminal justice, which is classified by the coding system into the "Some other major field" category. Of the 42 open-ended question responses of a criminal justice degree and no other, only 15 respondents chose "Some other major field," while 22 chose "Psychology, economics, or other social sciences." The remaining five chose other categories. These examples provide evidence that respondents have difficulty placing degrees into categories the way we expected.

6.5 How many more cases are identified as possible science and engineering graduates for the NSCG sampling frame using a combination of field of degree and occupation/educational attainment data compared to the current method of using just occupation/educational attainment data?

One of the proposed uses of the data from the field of degree question is to assist in building a sampling frame for the NSCG. The main focus is to identify possible science and engineering graduates. The current frame for NSCG used Census 2000 long form data to identify this population based on occupation and educational attainment. In light of the replacement of the Census long form by the ACS, we looked at the impact on the identification of this population of obtaining and using the field(s) of bachelor's degree in combination with occupation and educational attainment.

We started by using just educational attainment and occupation to identify science and engineering people, as has been done in the past. Using that method, we found 21 percent of the people reported to have a bachelor's degree or higher would be identified as possible science and engineering people, regardless of question version. When we also took into account field of degree, about 48 percent of the people reported to have a bachelor's degree or higher would be identified as possible science and engineering people using either question version.

Thus, we found no difference in the amount of people identified as possible science and engineering people between the two field of degree questions. Specifically, of people reported to have a bachelor's degree or higher in our sample, 27.9 percent in the categorical version and 26.4 percent in the open-ended version would not have been identified as possible science and engineering cases by the current method used by NSCG but are considered possible science and engineering people based on their field of degree. These numbers are not significantly different, indicating an identical gain in the sampling frame for the NSCG regardless of question version.

Table 5. Proportion of Graduates in the Sample Identified in a Science and Engineering Field*
(Universe: People reported to have a bachelor's degree or higher)

	Categorical (%)	Open-Ended (%)	Difference (%)	Margin of Error (%)	Significant
People identified in a Science & Engineering by FOD but not by occupation	27.9	26.4	1.5	±1.6 **	No

* Data are unweighted to best evaluate the effect on the size of the sampling universe.
** No adjustment was done for the complex sample design. Such an adjustment would increase the +/- range, so the general conclusion that there is no difference between the percentages would not change.

6.6 Does the addition of the field of degree question change the item nonresponse rate for the educational attainment question that precedes the field of degree question?

This question was added at the request of the NSF to ensure that the field of degree question did not hurt the completeness of the educational attainment question. We found no statistical difference in item nonresponse rates for educational attainment between the two versions for persons age 21+ (the age range that generally makes up the field of degree universe).

Table 6. Educational Attainment Item Missing Data Rates
(Universe: Persons age 21+)

Educational Attainment	Categorical (%)	Open-Ended (%)	Difference (%)	Margin of Error (%)	Significant
Item Missing Data Rate	4.6	4.2	0.4	±0.5	No

7. ADDITIONAL RESULTS

These results were not part of the decision criteria used to determine whether or not the questions we tested met the standards, nor which version performed better. They are, instead, presented as descriptive statistics to help NSF and the Census Bureau determine the full potential of the field of degree data.

7.1 Do the two versions of the field of degree question have differential missing data rates and response distributions for three racial/ethnic groupings (non-Hispanic Asians, non-Hispanic whites, all others) or by citizenship status (U.S. citizens versus non-citizens)?

Table 7a shows the item missing data rates for the three racial/ethnic groups and citizenship status. For all three race groups and two citizenship groups, the rates are higher for the open-ended version of the question. These findings are in line with the overall result in Section 5.2 of the open-ended version having higher missing data rates than the categorical version.

Table 7a. Field of Degree Item Missing Data Rates by Racial/Ethnic Group and by Citizenship Status
(Universe: People reported to have a bachelor's degree or higher)

	Item Missing Data Rates				
	Categorical (%)	Open-Ended (%)	Difference (%)	Margin of Error (%)	Significant
White Non-Hispanics	2.8	5.3	-2.5	±1.0	Yes
Asian Non-Hispanics	2.5	10.8	-8.3	±4.0	Yes
Other Race/Ethnicities	3.9	8.8	-4.9	±3.6	Yes
Citizens	3.1	6.1	-3.0	±1.0	Yes
Non-Citizens	3.2	11.5	-8.3	±4.7	Yes

The distributions by Science & Engineering and Non-Science & Engineering categories for the race/ethnic and citizenship groups are shown in Tables 7b and 7c, but there are no significant differences, due in part to large margins of error. The margins of error are large because the test was not designed to measure differences for racial or ethnic subgroups.

Table 7b. Field of Degree Response Distributions by Racial/Ethnic Group
(Universe: People reported to have a bachelor's degree or higher)

	Categorical (%)	Open-Ended (%)	Difference (%)	Margin of Error (%)	Significant
White Non-Hispanics					
Science & Engineering Degree	44.4	44.5	-0.1	2.4	No
Non-Science & Engineering Degree	55.6	55.5	0.1	2.4	No
Asian Non-Hispanics					
Science & Engineering Degree	64.3	57.8	6.5	8.8	No
Non-Science & Engineering Degree	35.7	42.2	-6.5	8.8	No
Other Racial/Ethnic Groups					
Science & Engineering Degree	49.1	43.7	5.5	6.5	No
Non-Science & Engineering Degree	50.9	56.3	-5.5	6.5	No

Table 7c. Field of Degree Response Distributions by Citizenship Status
(Universe: People reported to have a bachelor's degree or higher)

	Categorical (%)	Open-Ended (%)	Difference (%)	Margin of Error (%)	Significant
Citizens					
Science & Engineering Degree	45.4	44.3	1.1	2.2	No
Non-Science & Engineering Degree	54.6	55.7	-1.1	2.2	No
Non-Citizens					
Science & Engineering Degree	67.5	60.9	6.7	9.1	No
Non-Science & Engineering Degree	32.5	39.1	-6.7	9.1	No

7.2 What are the missing data rates and gross difference rates for the two versions of the field of degree question for those not responding for themselves (proxy responses) and those responding for themselves (self responses)?

The NSF requested a comparison of proxy versus self-response data for assistance with planning the sampling for the NSCG since they hypothesize that a self-report of field of degree will be more accurate than a proxy report. A limitation of this analysis for this research question is the assumption that one person completed the questionnaire independently. Other household members may have been consulted on their questions or completed sections on their own. Therefore, we cannot say that the person defined as the "respondent" was actually the respondent for the entire household, and we have limited confidence in the distinction of the self/proxy

reporting status. For this analysis, we define the first person in the household (Person 1) as the respondent and their answers are considered self-responses while the responses for all other people in the household are considered proxy responses. People in households with different respondents in the original and the CFU interviews are excluded from this analysis.

Table 8a gives the item missing data rates by self/proxy status for each field of degree question while Table 8b provides gross difference rates by self/proxy status.   Due to the limitations associated with determining self/proxy status, we did not compute margins of error for this analysis and no statistical comparisons were made. The item missing data rates for field of degree for open-ended are nominally higher than the categorical question version for both the self-respondents and the proxy respondents as identified for this analysis. As shown in Table 8b, the gross difference rates for open-ended are nominally lower than categorical for both the self respondents and the proxy respondents as identified for this analysis. The results shown in Tables 8a and 8b follow the same trend for the full test results shown in Tables 2 and 3a, respectively.

Table 8a. Field of Degree Item Missing Data Rates by Self/Proxy Status and Treatment
(Universe: People reported to have a bachelor's degree or higher)

	Item Missing Data Rates	
	Categorical (%)	Open-Ended (%)
Self-Response (Person 1)	2.3	5.6
Proxy Response (Other persons)	4.5	7.9

Table 8b. Field of Degree Content Follow-Up – Gross Difference Rates – by Self/Proxy Status
(Universe: People reported to have a bachelor's degree or higher by identical respondents in the original and CFU interviews)

	Gross Difference Rates			
	Self-Respondents		Proxy Respondents	
	Categorical vs. CFU (%)	Open-Ended vs. CFU (%)	Categorical vs. CFU (%)	Open-Ended vs. CFU (%)
Biological, agricultural, physical, earth, or other natural sciences	6.4	2.9	4.8	2.9
Health, nursing, or medical fields	2.9	0.5	4.2	1.2
Engineering, computer sciences, or mathematical sciences	3.9	2.1	2.1	1.6
History, arts, or humanities	8.7	4.9	9.2	4.6
Psychology, economics, or other social sciences	6.9	3.0	9.9	2.8
Business or management	4.9	2.3	5.9	2.5
Education or education administration	4.5	3.6	4.9	4.1
Some other major field	2.7	3.8	3.7	4.0

Table 8c gives the item missing data rates by self/proxy for the educational attainment question. The item missing data rates are nominally higher for the proxy respondents as identified for this analysis.

Table 8c. Educational Attainment Item Missing Data Rates by Self/Proxy Status
(Universe: Persons age 21+)

	Item Missing Data Rates (%)
Self-Response (Person 1)	3.3
Proxy Response (Other persons)	5.7

Originally, we planned to provide the gross difference rates for educational attainment by self/proxy status. However, to streamline the reinterview, the educational attainment question was only asked of people who had been identified as college graduates in the original data collection. Therefore, we cannot calculate a true gross difference rate for educational attainment since the full universe of respondents was not reinterviewed. As an alternative measure, we calculated the percentage of people reported to have a bachelor's degree or higher in the original interview that were reported to have less than a bachelor's degree in the CFU by self/proxy status. Since these people have less than a bachelor's degree in CFU, the field of degree question was not asked for these people. While no statistical testing was done, there appears to be little difference in the percentages for self (2.6 percent) and proxy (3.1 percent) responses.

We also examined the disagreement rate for people reported to have a bachelor's degree or higher in both interviews, but the level of higher education given in each was inconsistent (i.e. bachelor's degree in the original interview with a masters degree in the CFU). While there was no statistical testing done, it appears that the difference between the self-reporters (6.7 percent) and the proxy-reporters (7.7 percent) is minimal.

7.3 Does the open-ended version provide reliable estimates at a more detailed level that would be used when publishing the data? Do respondents report a level of detail that allows for publication at more than the eight categories in the categorical version of the question?

Census Bureau analysts developed a more detailed set of categories for consideration in publishing the data from the open-ended field of degree question. There are thirteen main categories, and two of those categories are further broken out into subcategories. The changes are detailed in Tables 9a and 9b.

Table 9a gives the response distribution for the new categories and subcategories for both the open-ended version and the 2003 NSCG (we cannot produce a similar distribution for the categorical version). Note that for the NSCG data, we could not break out the foreign language majors by the specific language studied, so those numbers are combined in the table.

Table 9a. Percent Distributions of Field of Degree Into Additional Categories for Open-Ended Version
(Universe: People reported to have a bachelor's degree or higher)

2007 ACS Content Test Categories	Categories Provided by Census Bureau Analysts	Response Distribution	
		Open-Ended (%)	2003 NSCG* (%)
Biological, agricultural, physical, earth, or other natural sciences	Biological or agricultural sciences	5.6	5.9
	Physical, earth, or natural sciences	4.4	3.4
Health, nursing, or medical fields	Health, nursing, or medical fields	7.6	7.2
	Nursing	3.3	3.2
	Other health and medical	4.4	4.0
Engineering, computer sciences, or mathematical sciences	Engineering	8.0	8.9
	Chemical or metallurgical engineering	0.6	0.7
	Civil engineering	0.6	1.1
	Electrical engineering	2.2	2.3
	Mechanical engineering	1.5	2.0
	Other engineering	3.0	2.8
	Computer and informational sciences	2.9	2.4
	Mathematics or statistics	1.9	1.9
History, arts, or humanities	French, German, Italian, and Spanish language studies	0.6	1.3 (combined)
	Other foreign language studies	0.5	
	Other history, arts, or humanities	13.9	12.9
Psychology, economics, or other social sciences	Psychology, economics, or other social sciences	15.2	14.2
Business or management	Business or management	22.4	20.9
Education or education administration	Education or education administration	14.0	15.2
Some other major field	Some other major field	10.1	8.2

Missing data not included. Persons falling in more than one category are counted in each category.
* Data are fully weighted and edited.

Since the Content Test data were not fully processed, we cannot make formal statistical comparisons between the open-ended and NSCG distributions. However, it does seem that the percentages are fairly close to one another for most categories.

Table 9b gives the gross difference rates and the indexes of inconsistency for the open-ended version of the test data. The gross difference rates are, in general, fairly low. Using the standards for interpreting the index of inconsistency presented earlier, we find that many of the indices are in the low inconsistency range (less than 20 percent), while the rest are in the moderate range (20 to 50 percent). The largest index of inconsistency for "French, German, Italian, and Spanish language studies" was due in part to a minor coding software problem that at

times put cases that should have been in this category erroneously into the "Other foreign language studies" category.

Table 9b. Field of Degree Content Follow-Up Comparison Statistics – Reliability Measures for Open-Ended Version
(Universe: People reported to have a bachelor's degree or higher who responded to the open-ended field of degree question in the original interview and CFU)

2007 ACS Content Test Categories	Additional Categories Provided by Census Bureau Analysts	Reliability Measures – Open-Ended Version	
		Gross Difference Rate (%)	Index of Inconsistency (%)
Biological, agricultural, physical, earth, or other natural sciences	Biological or agricultural sciences	1.2	11.3
	Physical, earth, or natural sciences	2.6	30.5
Health, nursing, or medical fields	Health, nursing, or medical fields	1.0	8.1
	Nursing	0.4	6.4
	Other health and medical	0.7	10.8
Engineering, computer sciences, or mathematical sciences	Engineering	1.2	8.0
	Chemical or metallurgical engineering	0.2	11.9
	Civil engineering	0.1	10.8
	Electrical engineering	0.3	6.3
	Mechanical engineering	0.7	24.9
	Other engineering	1.4	24.0
	Computer and informational sciences	1.1	20.3
	Mathematics or statistics	0.7	18.5
History, arts, or humanities	French, German, Italian, and Spanish language studies	0.5	40.5
	Other foreign language studies	0.2	26.3
	Other history, arts, or humanities	5.0	20.3
Psychology, economics, or other social sciences	Psychology, economics, or other social sciences	3.2	11.7
Business or management	Business or management	2.8	8.2
Education or education administration	Education or education administration	4.0	16.2
Some other major field	Some other major field	4.2	24.6

Missing data not included. Persons falling in more than one category are counted in each category.

8. SUMMARY OF EMPIRICAL RESULTS

We first considered the comparison of the test data to the 2003 NSCG data. Both question versions have distributions that are roughly comparable to the NSCG data. However, the categorical question produced nominally higher percentages for most categories than the open-ended question since more people marked multiple categories for this question version.

The second part of the analysis considers our main evaluation measures – reliability and item missing rates. The open-ended version provides a significantly higher level of reliability for the field of degree data than the categorical version. It appears that the marking of multiple categories in the categorical version is detrimental to its reliability. We intended that respondents would place each degree into only one field of degree category. The fact that significantly more people responded with multiple categories in the categorical version may indicate that people had difficulty in classifying degrees into the eight categories. They may have provided multiple categories if they felt the degree straddled the categories. Cognitive testing of the field of degree questions also found similar issues of multiple reporting for the categorical version (Rothgeb and Beck, 2007). Moreover, in CATI and CAPI, respondents were read each category as a separate question. So, without knowing what other categories there were, it appears that they responded "yes" to multiple categories.

While both question versions have item missing rates in line with other ACS questions, the open-ended question has a significantly higher item missing data rate than the categorical version for the field of degree question. This result is not entirely unexpected, as survey research literature as well as the 2006 ACS Content Test results support the finding that open-ended questions generally elicit fewer responses than categorical questions (Chesnut et al., 2007; Griffith et al., 1999.)

Finally, the low level of agreement between the question versions seems to provide further support for the fact that people have difficulty in classifying the degrees into the categories.

Taken together, these results seem to favor the open-ended question with the exception of the item missing data rates. The over-reporting of multiple categories appears to be a flaw in the design or administration of the categorical question, and provides support for the theory that people have difficulty classifying degrees uniquely into the categories. Additionally, the low levels of agreement between the categorical and open-ended versions can be attributed in part to the problems with multiple category reporting in the categorical version.

References

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Rothgeb, J. and Beck, J. (2007) "Final Report: Cognitive Interview Research Results and Recommendations for the National Science Foundation's Proposed Field of Degree Question for the American Community Survey." U.S. Census Bureau, Statistical Research Division, Research Report Series, Survey Methodology #2007-15.

CATI, CAPI, and CFU Versions of the Field of Degree Questions

Field of Degree CATI/CAPI Questions:
Categorical Version

1. This question focuses on [your/<Name>'s][1] BACHELOR'S DEGREE. In which of the following major fields did [you /he/she/<Name>] receive [your/his/her/<Name>'s] BACHELOR'S DEGREE or DEGREES? Please answer "Yes" or "No" for each category.

   Biological, Agricultural, Physical, Earth or Other Natural Sciences?

   (Interviewer enters '1' for "yes" and '2' for "no")

   The introductory text in Question 1 appears on the screen for Questions 2 to 8 but it is read by the interviewer only if he or she feels the respondent needs to hear the information again.

2. Health, Nursing, or Medical Fields?

3. Engineering, Computer Sciences, or Mathematical Sciences?

4. History, Arts, or Humanities?

5. Psychology, Economics, or Other Social Sciences?

6. Business or Management ?

7. Education or Education Administration?

8. Some other major field?

   If the answer to "Some other major field" is "yes", Question 9 is asked.

9. What was [your/<Name>'s] major field?

   The interviewer enters the verbatim response up to 75 characters.

Field of Degree CATI/CAPI Questions:
Open-Ended Version

1. This question focuses on [your/<Name>'s][4] BACHELOR'S DEGREE. What was the specific major of any BACHELOR'S DEGREES [you have/he has/she has/<Name> has] received? For example, chemical engineering, elementary teacher education, organizational psychology.

   The interviewer enters the verbatim response up to 75 characters.

Field of Degree CFU Questions:
Categorical and Open-Ended Versions

- Re-asking the version received in the original interview:

  Exactly the same as the CATI/CAPI versions shown.

- Asking the other version after re-asking the original version:

  Exactly the same as the CATI/CAPI versions shown, except the first sentence of the introduction is "This question also focuses on [your/<Name>'s] BACHELOR'S DEGREE."

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[1] The instrument fills in the word "your" if we are asking about the respondent, and the person's full name if we are asking about somebody else in the household.

Percent Distributions of Field of Degree by Mode
(Universe: People reported to have a bachelor's degree or higher)

Table B.1:
Percent Distributions of Field of Degree Mail Respondents

	Response Distributions	
	Categorical (%)	Open-Ended (%)
Science and Engineering Degrees**	**49.6**	**45.2**
1. Biological, agricultural, physical, earth, or other natural sciences	10.1	9.1
2. Health, nursing, or medical fields	9.6	7.1
3. Engineering, computer sciences, or mathematical sciences	14.7	13.7
4. History, arts, or humanities	18.4	15.3
5. Psychology, economics, or other social sciences	15.2	15.2
6. Business or management	21.6	21.4
7. Education or education administration	18.5	15.1
8. Some other major field	4.0	9.2
Total	112.2	106.3

Table B.2:
Percent Distributions of Field of Degree CATI Respondents

	Response Distributions	
	Categorical (%)	Open-Ended (%)
Science and Engineering Degrees**	**52.3**	**43.6**
1. Biological, agricultural, physical, earth, or other natural sciences	11.7	8.4
2. Health, nursing, or medical fields	10.6	8.6
3. Engineering, computer sciences, or mathematical sciences	14.5	8.7
4. History, arts, or humanities	23.5	12.2
5. Psychology, economics, or other social sciences	15.5	17.8
6. Business or management	26.6	24.9
7. Education or education administration	19.1	14.1
8. Some other major field	4.0	10.0
Total	125.4	104.8

Table B.3:
Percent Distributions of Field of Degree CAPI Respondents

	Response Distributions	
	Categorical (%)	Open-Ended (%)
Science and Engineering Degrees**	**51.1**	**45.6**
1. Biological, agricultural, physical, earth, or other natural sciences	12.1	12.7
2. Health, nursing, or medical fields	10.6	8.5
3. Engineering, computer sciences, or mathematical sciences	13.4	10.6
4. History, arts, or humanities	17.0	14.4
5. Psychology, economics, or other social sciences	14.9	13.8
6. Business or management	28.3	24.4
7. Education or education administration	15.0	10.7
8. Some other major field	4.4	12.7
Total	115.8	107.7

** Science and Engineering Degrees are the sum of categories 1, 2, 3, and 5

Field of Degree CFU Comparison Statistics – Gross Difference Rates by Mode

(Universe: People reported to have a bachelor's degree or higher who responded to field of degree in original interview and CFU)

Table C.1: **Gross Difference Rates** **Mail Respondents**	Categorical vs CFU (%)	Open-Ended vs CFU (%)	Difference (%)	Margin of Error (%)	Significant
Science & Engineering Degrees	**9.5**	**5.3**	**4.1**	**±1.3**	**Yes**
Biological, agricul., phys., earth, oth natural sciences	5.2	2.8	2.5	±1.0	Yes
Health, nursing, or medical fields	3.2	1.1	2.2	±0.7	Yes
Engineering, computer sciences, or math. sciences	3.0	1.5	1.5	±0.8	Yes
History, arts, or humanities	7.3	4.5	2.8	±1.3	Yes
Psychology, economics, or other social sciences	7.5	2.8	4.7	±1.0	Yes
Business or management	5.6	2.9	2.7	±1.0	Yes
Education or education administration	5.0	3.4	1.6	±1.0	Yes
Some other major field	2.8	3.9	-1.2	±0.8	Yes

Table C.2: **Gross Difference Rates** **CATI Respondents**	Categorical vs CFU (%)	Open-Ended vs CFU (%)	Difference (%)	Margin of Error (%)	Significant
Science & Engineering Degrees	**9.9**	**4.8**	**5.1**	**±3.6**	**Yes**
Biological, agricul., phys., earth, oth natural sciences	9.8	2.0	7.8	±2.7	Yes
Health, nursing, or medical fields	4.7	1.7	2.9	±2.2	Yes
Engineering, computer sciences, or math. sciences	3.8	1.1	2.7	±2.1	Yes
History, arts, or humanities	9.1	4.1	5.0	±3.4	Yes
Psychology, economics, or other social sciences	7.5	2.9	4.7	±2.8	Yes
Business or management	4.3	1.5	2.8	±2.1	Yes
Education or education administration	4.8	1.9	2.8	±2.7	Yes
Some other major field	2.5	3.9	-1.4	±1.8	No

Table C.3: **Gross Difference Rates** **CAPI Respondents**	Categorical vs CFU (%)	Open-Ended vs CFU (%)	Difference (%)	Margin of Error (%)	Significant
Science & Engineering Degrees	**13.2**	**9.0**	**4.3**	**±5.4**	**No**
Biological, agricul., phys., earth, oth natural sciences	6.9	4.8	2.1	±3.2	No
Health, nursing, or medical fields	4.9	0.5	4.4	±2.2	Yes
Engineering, computer sciences, or math. sciences	4.5	3.4	1.0	±2.6	No
History, arts, or humanities	12.0	7.4	4.7	±4.1	Yes
Psychology, economics, or other social sciences	9.4	4.6	4.8	±3.8	Yes
Business or management	5.7	3.3	2.4	±2.8	No
Education or education administration	4.7	6.7	-2.0	±3.1	No
Some other major field	4.6	5.0	-0.4	±3.5	No

Field of Degree Content Follow-Up Comparison Statistics - Index of Inconsistency
(Universe: People reported to have a bachelor's degree or higher who responded to field of degree in the original interview and CFU)

	Index of Inconsistency				
	Categorical vs. CFU (%)	Open-Ended vs. CFU (%)	Difference (%)	Margin of Error (%)	Significant
Science & Engineering Degrees	**21.1**	**12.3**	**8.8**	**±3.6**	**Yes**
Biological, agricultural, physical, earth, or other natural sciences	30.3	17.7	12.5	±4.5	Yes
Health, nursing, or medical fields	22.3	8.1	14.2	±4.4	Yes
Engineering, computer sciences, or mathematical sciences	14.1	8.6	5.6	±3.6	Yes
History, arts, or humanities	26.4	19.9	6.5	±4.3	Yes
Psychology, economics, or other social sciences	28.7	11.7	17.0	±4.5	Yes
Business or management	14.9	8.2	6.7	±2.4	Yes
Education or education administration	16.6	16.2	0.3	±3.3	No
Some other major field	41.6	24.6	17.0	±8.7	Yes

Intentionally Blank

Cognitive Interview Results and Recommendations for the National Science Foundation's Proposed Field of Degree Question for the American Community Survey

Jennifer M. Rothgeb and Jennifer L. Beck

KEY WORDS: cognitive testing, interviewer-administered survey, self-administered survey, American Community Survey, ACS, field of degree, National Science Foundation, bachelor's degree

ABSTRACT

The Decennial Statistical Studies Division (DSSD) contracted with the Statistical Research Division (SRD) to conduct cognitive testing of a proposed question for the American Community Survey (ACS) on "field of degree" for persons holding a bachelor's degree or higher. Three versions of the question were proposed by the National Science Foundation (NSF) for testing. The NSF requested that a field of degree question be added to the ACS to enable them to create a data base and sampling frame of scientists and engineers for the National Survey of College Graduates (NSCG.) Four researchers from SRD conducted a total of 42 cognitive interviews using three different versions (two forced-choice formats, one open-ended format) of the field of degree question. The questions were tested using all three modes of interviewing used by the ACS. All interviews were conducted in the Washington DC metropolitan area during July and August 2006. Results indicate that respondents tend to understand the intent of the question, but they are less clear about which category is the best match for their field of degree when presented with the forced-choice format. Also, with the simulated computer-assisted personal interviewing (CAPI) and computer-assisted telephone interviewing (CATI) forced-choice formatted cases, the lack of an instruction telling respondents to answer "yes" or "no" for each field of degree category presented an unknown response task problem for respondents. Details results on these and other findings are provided in the report. Recommendations agreed upon be the NSF and the Census Bureau are also included..

FINAL REPORT

**Cognitive Interview Research Results and
Recommendations for the National Science Foundation's
Proposed Field of Degree Question
for the American Community Survey**

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TABLE OF CONTENTS

I. BACKGROUND

The Division of Science Resources Statistics (SRS) within the National Science Foundation (NSF) compiles data on the science and engineering trained workforce in the United States. To create a data base and sampling frame to analyze characteristics of this workforce, SRS previously used data from the education attainment question on the decennial census long form. Individuals with a bachelor's degree or higher were selected into the sample and administered the National Survey of College Graduates (NSCG), which collected a detailed degree history, identifying science and engineering degree holders at the bachelor's level (Leach 2006a).

Because the Decennial Census now collects these data in the American Community Survey (ACS), NSF would like to include a Field of Degree (FOD) Question on the ACS. The addition of a Field of Degree question to the ACS would not only help NSF to more efficiently and accurately identify a sample of individuals with a science and engineering bachelor's degree, the degree information collected in this question would also be a valuable tool for other statistical agencies and data users who are interested in identifying and reporting on the educational background of people living in the U.S.

The NSF forwarded proposals to the Census Bureau with different versions of the proposed question for testing (Kannankutty 2005, Kannankutty 2006, Leach 2006a). NSF had three overall goals in developing the field of degree question. They were:
   (1) Develop a question that will be easily understood and "answerable" by individuals with college degrees as well as their proxies;
   (2) Develop a question that can be used for sampling for NSF's workforce surveys;
   (3) Develop a question that will provide analytic value for the broad community that follows issues of education and labor force.

The outcome of these goals is the development of a question that provides high quality information. With these goals in mind, NSF asked the Statistical Research Division (SRD) of the Census Bureau to pre-test the addition of a FOD question in the ACS.

In addition to staff from NSF and SRD, suggestions and comments on plans for the project were solicited from representatives of the Education Statistics Branch in the Population Division and the ACS Methods Branch in the Decennial Statistical Studies Division of the Census Bureau, as well as staff from the Department of Education. These groups contributed to the final decisions regarding question wording to use in the cognitive testing.

Results from cognitive testing will feed into decisions for the design of two field of degree questions to be included in the 2007 ACS Methods Panel Test.

II. METHODOLOGY

Four researchers from the SRD of the Census Bureau conducted forty-two cognitive interviews during June and July 2006. All researchers were trained in cognitive interview techniques. All interviews were tape-recorded, with consent of participants. Researchers listened to taped

interviews to prepare their detailed summary reports of each interview they conducted. Each researcher conducted between six and eight cognitive interviews. Each interview took approximately 30 - 45 minutes.

A. Design

For the pre-testing of the Field of Degree (FOD) question, NSF provided SRD with three different versions of the proposed question. NSF generated three potential versions of a FOD question with the goal of determining the most accurate way to collect FOD information.

Two versions (Versions A and B) of the question were forced choice, "Yes/No" format questions requiring respondents to check "yes" or "no" for each field of degree category. The third version (Version C) of the question was open-ended, requiring respondents to write in the exact field of each person's bachelor's degree. The "yes/no" versions were identical in wording and only varied in the number of degree categories. The open-ended version of the question had slightly different wording. Question wording for the three versions is contained in Appendix A.

All three question versions were administered using the three different interviewing modes used in the ACS. There were 8 computer-assisted-telephone interviews (CATI), 5 computer-assisted personal interviews (CAPI), and 29 self-administered questionnaires (SAQ) for a total of 42 interviews.   Table 1, below, shows the number of interviews by question version and mode.

Table 1: Number of Interviews by Mode and FOD Question Version

Mode	Question Version			Total
	A	B	C	
CAPI	3	2	3	8
CATI	1	2	2	5
SAQ	10	10	9	29
TOTAL	14	14	14	42

With CAPI and CATI modes, the Version A and B question is designed so that the introductory statement and the question stem is read to respondents. Then each category from the list of degree fields is read to respondents and respondents are to respond either "yes" or "no." With CAPI and CATI modes, the Version C question is designed so the introductory statement and open-ended question is read to the respondent. The example provided after the question is also read to the respondent. Three lines are allowed for the interviewer to enter the response.

With the SAQ mode, the Version A and B question is designed so that the respondent reads the introductory statement and the question stem. The question layout has the various categories of

degree fields listed with "Yes" and "No" boxes for the respondent to indicate whether that particular category contains his/her field of degree.   With the SAQ mode for the Version C open-ended question, the introductory statement, the open-ended question, and the example are displayed for the respondent to read. Three lines are provided for the respondent to list his/her field(s) of degree(s).

B. Participants

Forty-two research participants were recruited from the greater Washington DC area (DC, MD, and VA). Our general recruiting criteria were individuals who were 18 or older living in a household where at least one person held a bachelor's degree. Across all households we were also looking for participants who lived in households in which someone held a graduate degree, households with unrelated individuals, and participants who did not have a bachelor's degree, but would provide proxy reports on other household members who held at least a bachelor's degree. We recruited a wide variety of degree fields with an emphasis on those in the science fields. Participants received $40 for their contributions to the research.

It should be noted that pre-testing for the CAPI and CATI modes of the FOD question was combined with a separate pre-testing activity for the ACS demographic questions. As a result of these separate pre-testing activities, the demographic characteristics for participants and households for the 13 CATI/CAPI interviews were more diverse than the characteristics of participants and households for the 29 SAQ interviews.

A series of tables are presented below to illustrate the characteristics of the persons and their households included in this study:

- Table 2 summarizes the 42 participants' demographic characteristics.

- Table 3 summarizes the number of households (in which participants lived) containing at least one unrelated person, households with at least one person with a graduate degree(s), and/or households with at least one person who has a science degree.

- Table 4 summarizes all 96 persons across all households by mode and FOD question version for whom data were collected.

Table 2: Participants' Demographic Characteristics

Characteristic		Number of Participants
Sex	Male	14
	Female	28
Age	18-25	6
	26-35	11
	36-45	10
	46-55	7
	56-65	7
	65+	1
Race & Hispanic Origin	White	25
	Black	8
	Asian	7
	Other	7
	Hispanic	4
Education Level	High School	6
	Bachelor's Degree	15
	Graduate/ Professional Degree	21

Table 3. Participant's Household Characteristics.

Household Characteristic	Number of HH's
HH w/ Unrelated Individuals	12
HH w/ Graduate Degrees	30
HH w/at least 1 S&E Degree	36

Table 4. Number of Persons Across All Households by Mode and FOD Question Version

Mode	Question Version			
	A	B	C	Total
CAPI	2	4	7	13
CATI	9	5	4	18
SAQ	20	20	25	65
TOTAL	31	29	36	96

From these tables, we can see that participants in this study are skewed towards persons who are female, white, under 46 years old, highly educated and living in households where at least one person has a degree in a science or engineering field. Only six participants did not have a bachelor's degree. Thirty of the 42 participants lived in households where at least one person had a graduate degree. Twelve participants lived in households which contained at least one unrelated individual.

C. Materials and Procedures

To shorten the length of the interviews, for all three survey modes, we used an abbreviated version of the ACS instrument. The survey included the complete household roster and demographic questions, an abbreviated housing question section, and an abbreviated section of the person-level questions. To maintain the appropriate survey context, we included all person-level questions preceding the proposed placement of the FOD question. The FOD question was placed directly after a question asking about highest educational attainment since this is where it would be placed if added to the ACS. It was the last person-level question asked. Participants answered all of the person-level questions (regardless of mode) for up to five household members. Accordingly, we probed the FOD question for up to five household members to which it applied. (Note: There were no households with more than five persons.)

For the cognitive interviews in CAPI and CATI modes, an automated instrument was not available. We tested these versions of the question using a paper-based mock-up of the automated ACS instrument, with the researchers verbally administering the survey questions, following the necessary skip patterns and paths through the instrument. For the SAQ interviews, we used an abbreviated ACS mail-out form. Since the forms are self-administered, participants using the SAQs were asked to read aloud and state their answers to the survey questions aloud while completing the questionnaire.

The cognitive interview testing protocol employed both concurrent and retrospective probing. Participants were asked concurrent probes immediately after answering the FOD question for the

first time (for the first person in the house to whom the FOD question was answered). After completing the survey for all members of the household, participants were asked retrospective probes for each person for whom the FOD question was answered. Appendices B-1 through B-9 contains the cognitive interview protocols. All interviews were tape-recorded with the consent of the participants. Researchers listened to interview tapes to prepare summary reports. Nearly all interviews were conducted off-site at a place convenient for the participant.

III. RESULTS

Overall, most of the 42 participants had little difficulty providing a response to the FOD question for the total 96 persons for whom information was collected. However, there were those cases which proved more difficult because of less likely matches between a person's field of study and the categories listed in Versions A and B, or because a participant was not knowledgeable of another person's field of study. Such participants struggled to determine which category should be marked "yes" in the Version A and B FOD question. Most of the problems which did exist seemed to stem from lack of instructions for the persons completing the SAQ, in terms of whether they can mark one "yes" box only or more than one "yes" box for a single degree. For respondents administered the CATI/CAPI versions, some problems existed in a few cases in determining what the task was and what the response action was suppose to be. All of these issues are discussed in more detail in the specific sections below. (Note: In considering the results discussed in this section, the usual caveat applies regarding cognitive interviews. Participants were not randomly selected and the results are not generalizable to the larger population.)

A.   Question Comprehension

The question stem is the same in both Versions A and B. (Refer to Appendix A for display of questions.) The categories in Versions A and B, which transform the FOD question to a series of seven and ten questions, respectively, are slightly different. Version B has a separate category (d) for Engineering and a separate category (i) for Education. In addition, a category (e) has been added for "Physical or related sciences, including earth sciences." The category (h) for Business is "Business or management" in Version B, whereas in Version A, it is "Business or education."

Version C is an open-ended question with slightly different question wording than Versions A and B. In addition to a different question structure, the Version C wording refers to the "specific field(s)" in which a person received a bachelor's degree rather than "major field(s)" used in Versions A and B.

1.   Paraphrase of FOD question

The overwhelming majority of the 42 participants had no problem understanding the intent of the question stem. After the first administration of the question, the participants were asked to paraphrase the question telling us in their own words what the question is asking. Of the 40 paraphrases obtained, twelve referred to their "major" or what they "majored in."

Within the 40 paraphrases, many participants told us the question is asking " What was my major in college", "What the person majored in," "What major did I study in," "What area I got my degree in," "... ..what field I got my degree in." Participants clearly understood the concept in the question stem.

The complete set of verbatim paraphrases for the field of degree question is contained in Appendix C.

While participants understood what was being asked in the question stem, the question stem sometimes became an issue when participants struggled with the task of answering "yes" to the categories listed. Some participants were not sure whether they could mark "yes" to more than one category or whether they were to mark only one. While these comments are more relevant for the section below on Category Selection, the question stem seemed to affect a few participants' decision making once they started parsing the words. In some cases, participants focused back on the question stem to sort through the issue. For example, one participant re-read the stem, emphasizing "any" and "fields" in an attempt to determine whether to mark a "Yes" box in more than one category. Some participants thought the plural "field(s)" may be an indication to enter their "minor" degrees, but very few participants actually did that. While the question stem was clear to participants conceptually, the question stem in some cases had an impact on the action participants took regarding their task.

(Note that the word "field(s)" in the question stem should always be plural - fields, since there are multiple fields which the respondent is going to be asked about. "Field" in the singular is inappropriate in this context.)

2.   Interpretation of "major field(s)" - Versions A and B

When participants were probed about their interpretation of the phrase "major field(s)" within the question, they provided a wide range of responses. Participants also seemed to fully understand conceptually what was intended. Examples of subjects' interpretation of "major field(s)" include: "major," "primary area of concentration of study," "major concentration," "areas of academia," "broad category," "field of study," and "the department that granted my degree."

The complete set of verbatim responses of interpretation of "major fields" is provided in Appendix D.

3.   Interpretation of "specific field(s)" - Version C

Participants' interpretation of "specific field(s)" in Version C included "course of study," "course work," "they don't want a general degree, they want specifics," "specific field" and "major" mean the same," "umbrella term for a specific focus... chemistry would be the specific field for someone with a .....concentration in "analytical chemistry"". Curiously, it was also the physical layout of the SAQ Version C which led some participants to think that because there

were three lines below the question, they should provide more specific information regarding a person's degree.

The complete set of verbatim responses of interpretation of "specific fields" is provided in Appendix E.

4.   Transitioning from Highest Degree Attained to FOD for Bachelor's Degree.

During development of the FOD questions, there was some concern that survey respondents would not focus on the field of degree for a person's bachelor's degree, but would focus on the FOD for their highest degree, since that is the focus of the question immediately prior to the FOD question. From the 96 persons for whom FOD information was collected, there is no evidence of any problem experienced by the 42 participants when transitioning from the question about highest degree attained, which in many of these cases was a masters or doctorate degree, to the FOD question, for which the bachelor's degree was the focus. During the retrospective probing inquiring about this issue, several respondents said there was no problem because the FOD question specifically tells them to focus on the bachelor's degree. A few respondents suggested adding the word "only" to the transition statement to further reinforce that the focus is on the field of study of the bachelor's degree. The transitional lead-in sentence in the FOD question seems invaluable in serving its purpose. There were only a couple of respondents who were thinking about the higher degrees awarded or about a person's occupation when responding to the FOD question, but these cases were the very rare exception.

B.   Category Selection (Versions A and B)

While there was no indication of the question stem itself posing problems to participants, the task of selecting an appropriate category that fit their or other household members' FOD was onerous for several participants. There were several issues which were problematic, as identified below:

1.   CATI/CAPI Mode-related Issues

a.   Unknown list of categories

For CATI and CAPI participants, the categories were read to them one-by-one without the participants knowing what was included later in the list of categories. This posed a problem because participants had no idea what other types of categories would be asked about or how many categories were being presented, so they sometimes said "yes" to an earlier category, but then found out later that a different category was more applicable.

b.   Unknown response task - no instructions provided to participants

For a few CATI and CAPI participants, the structure of the categories and the unknown expected response (Yes/No) presented problems. When a category was read which contained several disciplines, a few participants thought they were to select one of the disciplines listed within that

category, rather than provide a yes/no response to the entire category read to them. A few participants told us that we should instruct them to respond "yes" or "no" to each category if that is what we want them to do.

2.   SAQ Mode-related Issues

a.   Interdisciplinary Single Degree Holders and Multiple Degree Holders

It was not clear to participants whether a person with a single degree, particularly for persons with an interdisciplinary single degree (e.g. Medical Biology, Agricultural Economics, Biopsychology), should mark all categories that apply or whether they are restricted to marking only one category. There were five persons for whom this issue was relevant. Three chose "yes" for two categories and in the alternative open-ended question provided two fields of study in the write in response. Two selected "yes" for only one category, but provided two fields of study in the open-ended alternative.   (This can be tracked by using Appendix F.)

Several SAQ participant multiple-degree holders were also confused because the question stem referred to "degree(s)," but there was no instruction stating whether to "mark all that apply" or to mark only one box.   Of the 96 persons for whom FOD information was gathered, six were identified as having a double major. In many cases, the majors were in similar fields and the participant was able to use one category to represent both majors. Four of the six persons with double majors, selected "yes" to only one category because that category was appropriate for both majors. One person with a double major marked "yes" to two categories and one person with a double major marked "yes" to three categories. During the retrospective probing when the Version C open-ended question was presented, all six persons wrote two specific fields in the answer space.

b.   "Yes/No" Response Format

It was totally unclear that participants were supposed to mark the "No" boxes on the SAQ for categories that did not apply to them or persons for whom they were proxy reporting. The overwhelming majority of respondents left the "No" boxes blank. When they were asked about it during the retrospective probing, most respondents gave reasons such as marking the "No" boxes seems no different than leaving them blank; because it seems that only the "yes" boxes need to be filled, and if boxes are not marked, then a "no" should be implied. Participants were generally looking for the category under which a degree major would be included so they could mark the "Yes" box. Even though participants read through the categories and verbally would say "No", it was very rare for them to ever actually mark the "No" boxes.

Several participants in this study considered the categories a list from which they needed to choose a relevant "Yes" box.   If all interviews were conducted in a manner where there is a flashcard (or SAQ questionnaire) and respondents can see all categories before choosing, that could be a viable option. However, with CATI as one of the interview modes in ACS we cannot entertain that option with this question format. The opportunity for response error would be too great if a list was read to respondents and they had to then select the appropriate category.

Page 9

Therefore, if the category list format moves forward into the ACS 2007 Content Test, we expect the "yes/no" format is required because it establishes each category as a separate question.

If the final FOD question is a format similar to Version A or B, information regarding the task to be completed by the respondent needs to be better communicated, especially to CATI/CAPI respondents. Respondents should be informed via an instruction on the CATI/CAPI screen telling them that a series of fields of study for bachelor's degrees will be read to them and we want them to respond "yes" or "no" to each category, depending on whether the field of degree ("major") fits into a particular category. However, this instruction is not necessarily going to remedy the problem of respondents choosing a category early on, not knowing that a more appropriate category will be read later. Another issue which could arise with this format is just the opposite - that is, that survey respondents may wait until they hear all the categories, answer "No" to all of them and then not remember what the earlier categories were. The interviewer would need to read through them all again. (Note that this is not anything we observed in our thirteen CATI/CAPI interviews.)

3.   Use of "Some Other Major Field"

The "Some Other Major Field" (SOMF) category on the Version A and B questionnaires was marked "yes" for 6 of the 60 persons for whom FOD information was collected using the categorical question format. The actual bachelor degrees (obtained during retrospective probing) for which the SOMF category was used included: anthropology, accounting, Latin, journalism, photography, and forestry. The cases were evenly split between self-reports and proxy-reports. For each of these cases, the participants had explanations as to why they selected the SOMF category; other categories had been considered, but the participants didn't think those categories would be appropriate.

There were also a couple of cases where a participant thought a person's FOD might belong in the SOMF category, but wanted to make their FOD fit into one of the other categories because they perceived the SOMF category as less meaningful.

4. Degrees Matched to Selected Categories

Appendix F may be of particular interest to NSF. It contains a table displaying each person's specific bachelor's degree description (obtained through retrospective probing), the category selected from the original questionnaire, the category selected from the alternative questionnaire, the write-in entry for the Version C alternative, mode, version identifier (for original version completed), self/proxy status and highest degree earned by the cognitive interview participant who was responding for his/her whole household. This table provides the detailed raw data for the 42 cases and 96 persons on whom data were collected in this research. It may be a valuable tool for NSF to review. Using the specific description of each person's bachelor's degree "major," and reviewing how participants categorized the field of study under all three question versions, NSF may be able to determine how often such degrees were classified incorrectly. (Estimating such cases, by reviewing NSF tables with Field Category and Fields included in the Category, we think there were approximately 7 mismatches. The FOD for which the suspected

mismatches occurred include: communication, forestry, accounting, Latin, journalism, philosophy, General Studies with emphasis in Education.) There are a few other cases related to International Affairs and International Development, which we are unsure whether they were classified correctly.

Although it appears that the majority of participants matched degrees with the categories on the list, the task of determining which category was appropriate was time-consuming and difficult for several participants. This difficulty should not be ignored. Some participants had difficulty because they thought the categories were too broad, too vague, too general, or hard to distinguish. The use of the phrase "other related sciences" in some categories was sometimes unclear to participants, and they were unsure whether their degree fit there or would be a better fit in a later category. Participants were confused sometimes by the specificity of some categories and lack of specificity in others.

C.   Write-in Entries (Version C)

1. Response Format

Question comprehension and participants' interpretation of the term "specific field(s)" in the open-ended Version C FOD question were discussed above in Section A. The response task seemed very clear to participants. They would write down their degree "major," sometimes noting the additional detail such as "civil engineer" or "international economics". There were very few issues associated with the open-ended question response format. As previously mentioned, some participants viewed the physical layout of the answer box (3 lines) as an indication that more information was desired than just the "major." Some participants wrote the B.A. or B. S. in front of their majors. Others thought perhaps we also wanted to know about their minors, and specified their minor areas of concentration.

Participants who were exposed to the open-ended question as an alternative to the categorical question frequently commented that the open-ended format was much easier than trying to fit a "major" into one of the categories (in the other version.) It was quite clear that persons responding to the open-ended question understood what the question was asking and what they needed to do. No one seemed confused or unclear about what they should enter in the answer space.

2.   Usefulness of Example: "Elementary Teacher Education"

Some participants found the example of "elementary teacher education" helpful in determining the level of detail requested in the open-ended Version C FOD question. Some stated that it indicated to them not to just write "B.A." or "B.S.," but to include the major as well. Many (probably the majority) participants didn't have an opinion about the example. A few participants stated that it was not helpful to them because they are not in education. (They interpreted the example as applicable only to persons in education, rather than as an example to convey level of specificity desired.)

D. Proxy Reporting

Obviously there was considerable proxy reporting given that 42 participants provided information about 96 persons.   From the cases where participants expressed doubt about their proxy responses, the most doubt was in households consisting entirely of unrelated persons. There were a couple of such cases where proxy respondents left the FOD question blank or wrote DK. There were a couple of cases where the proxy wrote an entry in the open-ended question and put question marks before or after the entry, as an indicator that there was some doubt about their entry. Frequently, when participants were having some difficulty selecting a category or writing in a specific field, they would comment that if they were completing the questionnaire at home (in the case of the SAQ), they would specifically ask the person rather than just guess.

E. Version Preference

After participants had completed the original interview/questionnaire, they were then presented with the other versions containing the FOD alternatives and asked to complete them. In the case of participants whose original version was C, they were only presented with either alternative A or B, but not both. Once they completed all versions and all probing questions had been administered, researchers asked participants which FOD question version they preferred and why. Provided below is a table displaying the version preference of the participants. (Note that there is some subjectivity in the classification of the version preference. Some participants mentioned that it wouldn't matter, any version would be okay, but later in their comments would state a preference of a particular version or use language indicating a preference. The full text of participants' verbatim responses about their version preference is provided in Appendix G.)

Table 5. Participants Preference of FOD Question Version

	A	B	A or B	C	C and A/B	Total	*Coding issues mentioned*
CATI/CAPI	1			9		10	2
SAQ	2	8	3	11	7	31	7
TOTAL	3	8	3	20	7	41	9

Even with the caveat above regarding subjectivity in classification of version preference, it seems apparent that nearly half (20) of the participants preferred Version C. There were seven participants who liked Version C and Version A or B, because one version was better for them to use for themselves and the other version was better for them to report for others in the household. There were three who preferred Versions A or B, definitely not liking Version C.

Of the ten participants administered the questionnaire through a mock CATI/CATI survey instrument, their preference for Version C was almost unanimous (9 of 10).   These participants commented that this version was the "quickest and easiest," "time efficient," "...didn't have to listen to all those long categories and then decide...," "long list difficult over the phone," etc.

Similarly, the SAQ participants expressed that they like the ease and directness of the open-ended question. They preferred just writing down a "major" in the open-ended structure, rather than having to go through the list of categories (in Versions A and B) and taking the time to determine what would be an appropriate category for their degree, if it was not easily apparent. There was less information to digest. They understood the question, knew what their "major" was and could just write it down.

Some participants thought the open-ended structure of Version C with multiple lines and the term "specific fields" indicated that more detail was necessary. Participants with this interpretation were concerned about the use of the Version C question when responding for others since they may not always know those details.

Interestingly, several participants who preferred Version C voiced concern over the resources (staffing, time, training) needed to code the open-ended responses and the accuracy of that coding. Some participants actually stated they preferred Version A or B because of the issues surrounding coding of open-ended responses.

Version B was the second most favored version. Some participants noticed the greater specificity with the longer list of categories in Version B, especially those participants for whom it made a difference, such as those with degrees in the physical sciences, earth sciences, business or education.

F. Summary - What Worked Well/Didn't Work Well by Version

Provided below is a summary of what worked well with each question version, what didn't work well, what potential errors could occur with each version, as well as what difficulties each version poses.

Version A	Version B	Version C
What worked well?		
● **When R knows the degree and or/ when the degree field is clearly listed in a particular category.** ● **"Some other major field" category worked well for Rs who don't know the specific degree but know general major field and that none of the listed categories fit.**	●**When R knows the degree and /or when the degree is clearly listed in a particular category.** ● **More options, helped R decide better, e.g. separating education from business; listing earth sciences separate from biological sciences.** ●**"Some other major field" category worked well for Rs who don't know the specific degree but know general major fields and that none of the listed categories fit.**	● **C works very well for most respondents, especially when R knows the actual degree, but cannot fit it in any of the categories and don't like idea of using "Some other major field."** ● **Also works well for Rs who in Version A and B checked more than one category to represent only one degree.** ● **Allows R to be more specific, more accurate.** ● **Rs favored it, thinking it was less effort, faster, no excess information to process for decision making, more efficient.** ● **Potentially less error with Version C, because format in A& B are difficult for some Rs.**

Version A	Version B	Version C
What didn't work well?		
● **Rs are confused with the SAQ format; no clear instructions on marking "yes/no' boxes.** ● **Rs are confused whether to mark "yes" for one category only or for all relevant fields, regardless of whether they had a double major.** ● **Categories not always clear to Rs and Rs have some difficulty matching degrees to an appropriate category.** ● **For CAPI/CATI, Rs find it difficult and tedious to have to listen to the list, and have no idea what other categories will come later in the list.**	● **Categories are not mutually exclusive. Rs sometimes uncertain whether to mark "a" or "e", and whether to mark "a" or "b"** ● **Rs are confused with the SAQ format; no clear instructions on marking "yes/no' boxes** ● **Rs are confused whether to mark "yes" for one category only or for all relevant fields, regardless of whether they had a double major.** ●**Categories not always clear to Rs and Rs have some difficulty matching degrees to an appropriate category.** ● **For CAPI/CATI, Rs find it difficult and tedious to have to listen to the long list. Rs also have no idea what other categories will come later in the list.**	● **When R does not know the specific degree but has an idea of what general field the degree fits under, such as the fields listed in Version A or B.** ● **Unknown:** **Coding issues: Cost, time, accuracy.**

Types of errors		
Version A	**Version B**	**Version C**
● **Marking more than one 'yes' box for a single degree earner (especially if it's a mix of science/non-science and the science entry is incorrect.)** ● **Selecting first category that seems to fit degree when later category is a better fit.**	● **Marking more than one 'yes' box for a single degree earner (especially if it's a mix of science/non-science and the science entry is incorrect.)** ● **Selecting first category that seems to fit degree when later category is a better fit.**	● **Having multiple lines in answer space for open-ended question may lead to Rs entering "more" information than needed (e.g. "Minor" fields of study)**
What type of difficulty?		
● **Difficult with CATI/CAPI because of all the categories that need to be read;** ● **Lack of instructions for R.**	● **Difficult with CATI/CAPI because of all the categories that need to be read;** ● **Lack of instructions for R.**	● **Difficult if R does not know actual degree. If R knows general area of degree, then Version A or B may be less difficult.**

IV. RECOMMENDATIONS

Based on the results discussed in the previous section, we propose the following recommendations for the FOD question in the 2007 ACS Methods Panel Test:

- Include a modified version of the Version C open-ended question. For the most part, this question was the version participants could most easily answer. They basically viewed it as asking them to write down what they "majored in." This recommendation is not based on the participants overwhelming preference for the open-ended question. (We have conducted enough research to know that questions respondents and interviewers prefer because they are "easier to answer" are not always the questions that produce the most accurate data.) Our recommendation is based on our observations of the various difficulties respondents had with the response task associated with the Version A or B list of degree categories. We believe the "yes/no" list format design, as used in Versions A

and B, could lead to misclassification of science degrees, especially among proxy respondents, and have serious negative consequences.

The item nonresponse associated with an open-ended question or the misclassification because of a respondent's lack of information about a household member is unknown, given the limits of our research. The ACS 2007 Methods Panel Test should be able to address both of these issues. Given the expected sample size, determining whether the item nonresponse rate and misclassification rate are unacceptable should be feasible. In addition, we anticipate that when the ACS SAQ is completed in an actual residence, the person completing the questionnaire will ask household members what should be entered for FOD when the household respondent is uncertain. (Given the unnatural context of the cognitive interviews, that was not possible and participants had to guess or put "don't know.") If there is a content reinterview followup that will be conducted after the 2007 ACS Methods Panel Test, that should help to provide data about the reliability of the reports from the open-ended question.

Throughout the interviews, participants frequently made reference to a person's "major," not a "major field" or "specific field." A few participants even questioned why we weren't just asking about their "major" because they do not think of it as a "field." Don Dillman was contracted by NSF to conduct cognitive interviews using different versions of the FOD question than the Census Bureau (though his research was limited only to self-administered mode.) Some of his question wording for the open-ended question included the term "specific major" rather than "major field" (Dillman et al. 2006a.) There was no evidence in his research reports to suggest that "specific major" was as problematic or more problematic than we found "major field" to be. We therefore recommend adopting the term "specific major" for the open-ended question.

- Provided below is our recommendation for the open-ended FOD question format in both the SAQ and the CATI/CAPI mode.

SAQ Mail Mode

This question focuses on this person's BACHELOR's DEGREE. Please list below the specific major(s) of any BACHELOR'S DEGREES this person has received.
For example, computer science, elementary teacher education, psychology.

_____

_____

_____

_____

CATI/CAPI Mode

This question focuses on (Name's/your) BACHELOR'S DEGREE. What was the specific major of any BACHELOR'S DEGREES (you/he/she) (have/has) received? *For example, computer science, elementary teacher education, psychology.*

_____
_____
_____

- Given that two versions of the FOD question will be tested in the 2007 ACS Methods Panel Test, we realize that it is likely that one of the two versions be a forced-choice question format. Therefore, we propose the following forced-choice categorical formatted question.

SAQ Mail Mode

This question focuses on this person's BACHELOR'S DEGREE. In which of the following major fields did this person receive his/her BACHELOR'S DEGREE(S):

Please mark (X) "Yes" or "No" for each category.

		Yes	No
a.	Biological, Agricultural, Physical, or related sciences?	☐	☐
b.	Health, Nursing, or Medical Fields?	☐	☐
c.	Engineering, Computer, Mathematical, or related sciences?	☐	☐
d.	History, Arts, or Humanities?	☐	☐
e.	Psychology, Economics, or Other Social Sciences?	☐	☐
f.	Business or Management?	☐	☐
g.	Education?	☐	☐
h.	Some other major field?	☐	☐

(If yes, please specify_____)

CATI/CAPI Mode

This question focuses on (Name's/your) BACHELOR'S DEGREE. In which of the following major fields did (you/he/she) receive (your/his/her) BACHELOR'S DEGREE(S):

Please answer "Yes" or "No" for each category.

		Yes	No
a.	**Biological, Agricultural, Physical, or related sciences?**	☐	☐
b.	**Health, Nursing, or Medical Fields?**	☐	☐
c.	**Engineering, Computer, Mathematical, or related sciences?**	☐	☐
d.	**History, Arts, or Humanities?**	☐	☐
e.	**Psychology, Economics, or Other Social Sciences?**	☐	☐
f.	**Business or Management?**	☐	☐
g.	**Education?**	☐	☐
h.	**Some other major field?**	☐	☐

(If yes, please specify_____)

- In summary**,** the characteristics of the question revisions proposed by the Census Bureau includes:

  1. Capitalize the first letter of each field, not just the first letter in each category of the forced-choice format. (Suggested in Dillman's research. See Dillman et al. 2006a.)

  2. Have BACHELOR'S DEGREE in upper case in both the lead-in statement and the actual question for both question formats. This will provide emphasis about the focus of the question for both the interviewer and respondent, regardless of interview mode.

  3. Include a "specify" line for the "some other major field" category in the forced-choice format. This will allow respondents whose degrees do not fit into any of the available categories to enter their field of degree.

  4. Re-arrange the History and Psychology categories in the forced-choice question since research participants tended to react to History as an exception. Although

this violates the science and engineering groupings, respondents might have an easier time locating a History degree from the list. This re-arrangement also save on space.

5. Separate out Business and Education. These categories are very different and unrelated.

6. Include an instruction to mark/respond either "yes" or "no" for each category or group of categories in the forced-choice format.

7. For the open-ended question format, use the term "specific major," rather than "major field."

8. For the open-ended question format, use more than one example in order to broaden the cue to respondents as to what level of information is requested.

V. FINAL DECISIONS

Census Bureau staff, NSF staff and a representative from the Department of Education met to discuss this report and the recommendations. NSF also had additional results from Don Dillman's second round of cognitive interviews (Dillman et al. 2006b.) After the discussion at the meeting, review of Dillman's results and internal discussions at NSF after the meeting, NSF decided on question wording for the field of degree question for the 2007 ACS Methods Panel Test (Leach 2006b, Leach 2006c.) The Methods Panel will be a split-panel test which enables both a categorical formatted series of questions and an open-ended question to be included. Appendix H contains the final question wording agreed upon by NSF and the Census Bureau for the 2007 ACS Methods Panel Test. Very few changes were made between the recommendations in this report and the final wording agreed upon by NSF and the Census Bureau.

Evaluation of the ACS 2007 Methods Panel data will be accomplished through several measures including item nonresponse rates, reinterview data, and behavior coding data to determine which question format is best suited for inclusion in the ACS.

REFERENCES

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Leach, N. (2006b.) Email to Wendy Hicks. NSF's Proposed Revised Question Wording for ACS Field of Degree Question for the 2007 Methods Panel Test. August 31, 2006. National Science Foundation.

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ACKNOWLEDGMENTS

Field of Degree Question Versions Used for Cognitive Testing

Version A

This question focuses on this person's bachelor's degree. Did this person receive his/her bachelor's degree(s) in any of the following major field(s):

	Yes	No
a. Biological, agricultural, physical or related sciences?	□	□
b. Health, nursing or medical fields?	□	□
c. Engineering, computer, mathematical or related sciences?	□	□
d. Psychology, economics, or other social sciences, except history?	□	□
e. History, arts or humanities?	□	□
f. Business or education?	□	□
g. Some other major field?	□	□

Version B

This question focuses on this person's bachelor's degree. Did this person receive his/her bachelor's degree(s) in any of the following major field(s):

	Yes	No
a. Biological, agricultural, or related sciences?	□	□
b. Health, nursing, or medical fields?	□	□
c. Computer, mathematical, or related sciences?	□	□
d. Engineering?	□	□
e. Physical or related sciences, including earth sciences?	□	□
f. Psychology, economics, or other social sciences, except history?	□	□
g. History, arts or humanities?	□	□
h. Business or management?	□	□
i. Education?	□	□
j. Some other major field?	□	□

Version C

This question focuses on this person's bachelor's degree. In what specific field(s) did this person receive his/her bachelor's degree(s)? For example, elementary teacher education.

DEGREE FIELD(S)

_____

_____

_____

CATI
VERSION A
American Community Survey
Field of Degree Question
Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interviews can be obtained from the authors.)

FIELD OF DEGREE QUESTION

Q6. **If highest degree completed is greater than bachelor's degree, read:**
The next question focuses on your/this person's bachelor's degree.
Did [you/this person] receive [your/his/her] bachelor's degree in any of the following major field or fields:

		Yes	No
a.	Biological, agricultural, physical or related sciences?	☐	☐
b.	Health, nursing or medical fields?	☐	☐
c.	Engineering, computer, mathematical or related sciences?	☐	☐
d.	Psychology, economics, or other social sciences, except history?	☐	☐
e.	History, arts or humanities?	☐	☐
f.	Business or education?	☐	☐
g.	Some other major field?	☐	☐

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered.</u>)

➢ In your own words, what is this question asking?

➢ How did you arrive at your answer for the field of [your/name's] bachelor's degree?

➢ The question asks: (READ QUESTION STEM). What does "major field or fields" mean to you in this question?

GENERAL PROBES (To be asked after the field of degree question is asked of each eligible person):

➢ How did you come up with that answer?

➢ Tell me more about that.

➢ I noticed that you hesitated. Tell me what you were thinking.

RETROSPECTIVE PROBES (Probes asked at the end of interview after all questions had been asked of all eligible household members.)

Universe: Persons in household with a bachelor's degree or higher.

♦ Ask <u>after</u> survey questions have been completed for all persons in the household.

♦ Administer the following series of probes for the Q6 field of degree question for <u>EACH</u> person in the household who has a bachelor's degree or higher.

♦ Reread the field of degree question (Q6) to the respondent..

  Ask: In what specific field or fields did [you/name] receive [your/his/her] bachelor's degree?

♦ For persons who were not <u>first person listed in hhld with a bachelor's degree or higher:</u>

  Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

- For all persons:

  Ask: Did you find it difficult to find a category that fit the particular major field of [your/name's] bachelor's degree?

  > If Yes: Tell me about that.

  Ask: From the way we presented the response options, did you have any problems figuring out how to select a particular category to describe your/name's degree?

- If Q6 has only one field of degree marked:

  Ask: Do/Does [you/name) have more than one major? More than one bachelor's degree?

  > If Yes: Tell me a little about why you didn't answer Yes to more than one category in order to represent multiple bachelor's degree or double major.

- If Q6 has more than one field of degree marked:

  Ask: I noticed you picked more than one category. Can you tell me more about that?

- For anyone with graduate degree(s):

  Ask: I noticed (re-read educational attainment question, if necessary) you indicated [you have/name has] a graduate degree. In what major field is that graduate degree?

  Re-read Q6. Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

- For all persons:

  Ask: The last category in the question asks about "some other major field". What does "some other major field" mean to you?   Can you give me some examples of the types of degrees that might fall into this category?

- If "Yes" for "Some other major field" in Q6:

  Ask: Why did you choose the "Some other major field" category for (your/name's) bachelor's degree field?

  Ask: Did you consider any of the listed categories before choosing the "Some other major field" category?

- For all persons:

    Ask: When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

- **After above probes have been asked for <u>all</u> persons with a bachelor's degree and higher, administer the following:**

    We are testing two other versions of this question. Using these other versions of the question, I would like to ask you now to answer the questions for [you/name].

- Administer Version B Q6 first for each eligible person and have respondents answer before administering Version C Q6. Once you've completed administration of Version B, ask Version C for each eligible person.

- ****If warranted, ask respondent any of the relevant probes above (specific to responses to alternate Version B and/or Version C). ****

- All Persons:

    Ask: Do you have a preference for a particular version of the question?

        If yes: Tell me a little about why you prefer that version.

CATI
VERSION B
American Community Survey
Field of Degree Question
Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interview can be obtained from the authors.)

FIELD OF DEGREE QUESTION

Q6. ♦ If highest degree completed is greater than bachelor's degree, read:

The next question focuses on your/this person's bachelor's degree.)

Did [you/this person] receive [your/his/her] bachelor's degree in any of the following major field or fields:

		Yes	No
a.	Biological, agricultural or related sciences?	☐	☐
b.	Health, nursing or medical fields?	☐	☐
c.	Computer, mathematical or related sciences?	☐	☐
d.	Engineering?	☐	☐
e.	Physical or related sciences, including earth sciences?	☐	☐
f.	Psychology, economics or other social sciences, except history?	☐	☐
g.	History, arts or humanities?	☐	☐
h.	Business or management?	☐	☐
i.	Education?	☐	☐
j.	Some other major field?	☐	☐

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered.</u>)

> ➢ In your own words, what is this question asking?
> ➢ How did you arrive at your answer for the field of [your/names'] bachelor's degree?
> ➢ The question asks: (READ QUESTION STEM). What does "major field or fields" mean to you in this question?

GENERAL PROBES (To be asked after the field of degree question is asked of each eligible person):

> ➢ How did you come up with that answer?
> ➢ Tell me more about that.
> ➢ I noticed that you hesitated. Tell me what you were thinking.

RETROSPECTIVE PROBES (Probes asked at the end of interview after all questions have been asked of all eligible household members.)

Universe: Persons in household with a bachelor's degree or higher.

♦ Ask <u>after</u> survey questions have been completed for all persons in the household.

♦ Administer the following series of probes for the Q6 field of degree question for <u>EACH</u> person in the household who has a bachelor's degree or higher.

♦ Reread the field of degree question (Q6) to the respondent.

   Ask: In what specific field or fields did [you/name] receive [your/his/her] bachelor's degree?

♦ For persons who were not <u>first person listed in hhld with a bachelor's degree or higher:</u>

   Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

♦ For all persons:

   Ask: Did you find it difficult to find a category that fit the particular major field of [your/name's] Bachelor's degree?

      If Yes: Tell me about that.

   Ask: From the way we presented the response options, did you have any problems figuring out how to select a particular category to describe your/name's degree?

♦ If Q6 has only one field of degree marked:

   Ask: Do/Does [you/name) have more than one major? More than one bachelor's degree?

      If Yes: Tell me a little about why you didn't answer Yes to more than one category in

order to represent multiple bachelor's degree or double major.

- If Q6 has only one field of degree marked:

   Ask: I noticed you picked more than one category. Can you tell me more about that?

- For anyone with graduate degree(s):

   Ask: I noticed (re-read educational attainment question (Q5), if necessary) you indicated [you have/name has] a graduate degree. In what major field is that graduate degree?

   Re-read Q6. Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

- For all persons:

   Ask: The last category in the question asks about "some other major field". What does "some other major field" mean to you? Can you give me some examples of the types of degrees that might fall into this category?

- If "Yes" for "Some other major field" in Q6:

   Ask: Why did you choose the "Some other major field" category for (your/name's) Bachelor's degree field?

   Ask: Did you consider any of the listed categories before choosing the "Some other major field" category?

- For all persons:

   Ask: When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

- **After above probes have been asked for all persons with Bachelor's degree and higher, administer the following:**

   We are testing two other versions of this question. Using these other versions of the question, I would like to ask you now to answer the questions for [you/name].

- Administer Version B Q6 first for each eligible person and have respondents answer before administering Version C Q6. Once you've completed administration of Version B, ask Version C for each eligible person.

- ****If warranted, ask respondent any of the relevant probes above (specific to responses to alternate Version A and/or Version C). ****

- All Persons:

   Ask: Do you have a preference for a particular version of the question?

      If yes: Tell me a little about why you prefer that version.

CATI

VERSION C

American Community Survey

Field of Degree Question

Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interviews can be obtained from the authors.)

FIELD OF DEGREE QUESTION

Q6. ♦ If highest degree completed is greater than bachelor's degree, read:

The next question focuses on your bachelor's degree.

In what specific field or fields did [you/this person] receive [your/his/her] bachelor's degree?

For example, elementary teacher education.

DEGREE FIELD(S):

_____
_____
_____

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered.</u>)

➢ In your own words, what is this question asking?

➢ How did you arrive at your answer for the field of [your/names'] bachelor's degree?

➢ The question asks: (READ QUESTION STEM). What does "major field or fields" mean to you in this question?

GENERAL PROBES:

➢ How did you come up with that answer?

➢ Tell me more about that.

➢ I noticed that you hesitated. Tell me what you were thinking.

RETROSPECTIVE PROBES **(These probes are asked at the end of the interview after all the survey questions have been asked of all eligible household members.)**

Universe: Persons in household with a bachelor's degree or higher.

♦   Ask <u>after</u> survey questions have been completed for all persons in the household.

♦   Administer the following series of probes for the Q6 field of degree question for the respondent. Repeat the series of probes for other persons in the household who have a bachelor's degree or higher.

♦   Reread the field of degree question (Q6):

Ask: Did you find it difficult to describe your/this person's particular specific field of degree?
> If Yes: Tell me a little about that.

Ask: Did the example (elementary teacher education) help explain what level of detail we were asking for?

Ask: Do/Does [you/name] have more than one bachelor's degree or have a double major?
> If Yes: Did you list all the fields for [your/name's] multiple bachelor's degree or double major? If not, then why?

♦   For anyone with a graduate degree (as indicated in Q5.):

Ask: I noticed in Q5 (re-read Q5 - educational attainment question, if necessary) you indicated [you have/name has] a graduate degree. What did you get your graduate degree in?

Re-read Q6 Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

♦   For all persons:

Ask: When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

♦ **After above probes have been asked for <u>all</u> persons with bachelor's degree and higher, administer the following:**

♦ For all Version C cases: Half of the cases will be assigned presentation of alternate Version A Q6 and the other half will be assigned presentation of alternate Version B Q6.

> I have another version of this question which we are testing. I would like to ask you now to answer this question for [you/name].

♦ Administer either Version A Q6 or Version B Q6, as assigned, for each eligible person.

♦ READ: "The next series of questions I have will be about this alternate version of the question you just answered."

> Ask: When answering this alternate version, did you find it difficult to find a category that fit your/this person's particular major field of degree? If Yes: Tell me a little about that.

♦ Only for the first person debriefing questions are asked about:

> Read: The question asks: (READ ALTERNATE Q6 STEM). What does "major field or fields" mean to you in this question?

♦ All Persons:

> Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

> From the way we presented the response options, did you have any problems figuring out how to select a particular category to describe you/name's degree?

♦ If Q6 (alternate) has only one field of degree marked:

> Ask: Do/Does [you/name) have more than one major? More than one bachelor's degree?

> If Yes: Tell me a little about why you didn't answer Yes to more than one category in order to represent multiple bachelor's degree or double major.

♦ If Q6 (alternate) has more than one field of degree marked:

> Ask: I noticed you picked more than one category. Can you tell me more about that?

♦ For anyone with graduate degree (as indicated in Q5.) :

> Ask: I noticed in Q5 (re-read Q5 - educational attainment question, if necessary) you indicated [you have/name has] a graduate degree. What did you get your graduate degree in?

♦ Re-read ALTERNATE Q6.

    Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

♦ All Persons

    Ask: The last category in the question asks about "some other major field". What does "some other major field" mean to you? Can you give me some examples of the types of degrees that might fall into this category?

♦ If "Yes" For "Some other major field" in alternate Q6,

    Ask: Why did you choose the "Some other major field" category for your/name's) bachelor's degree field?

    Did you consider any of the listed categories before choosing the "Some other major field" category?

♦ All Persons

When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

♦ All Persons

    Do you have a preference for a particular version of the question?

        If yes: Tell me a little about why you prefer that version.

CAPI

VERSION A

American Community Survey

Field of Degree Question

Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interview can be obtained from the authors.)

FIELD OF DEGREE QUESTION

		Yes	No
Q6. ♦ If highest degree completed is greater than bachelor's degree, read:			
The next question focuses on your bachelor's degree.			
Did [you/name] receive [your/name's] bachelor's degree in any of the following major field or fields:			
a.	**Biological, agricultural, physical or related sciences?**	☐	☐
b.	**Health, nursing or medical fields?**	☐	☐
c.	**Engineering, computer, mathematical or related sciences?**	☐	☐
d.	**Psychology, economics, or other social sciences, except history?**	☐	☐
e.	**History, arts or humanities?**	☐	☐
f.	**Business or education?**	☐	☐
g.	**Some other major field?**	☐	☐

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered.</u>)

➤ In your own words, what is this question asking?

➤ How did you arrive at your answer for the field of [your/names'] bachelor's degree?

➤ The question asks: (READ QUESTION STEM). What does "major field or fields" mean to you in this question?

GENERAL PROBES (To be asked after the field of degree question is asked of each eligible person):

➤ How did you come up with that answer?

➤ Tell me more about that.

➤ I noticed that you hesitated. Tell me what you were thinking.

RETROSPECTIVE PROBES (To be asked at the end of the interview after all the questions have been asked of all eligible household members.)

Universe: Persons in household with a bachelor's degree or higher.

♦ Ask <u>after</u> survey questions have been completed for all persons in the household.

♦ Administer the following series of probes for the Q6 field of degree question for <u>EACH</u> person in the household who has a bachelor's degree or higher.

♦ Reread the field of degree question (Q6) to the respondent.

　　Ask: In what specific field or fields did [you/name] receive [your/his/her] bachelor's degree?

♦ For persons who were not <u>first person listed in hhld with a bachelor's degree or higher:</u>

　　Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

♦ For all persons:

　　Ask: Did you find it difficult to find a category that fit the particular major field of [your/name's] bachelor's degree?

　　　　If Yes: Tell me about that.

　　Ask: From the way we presented the response options, did you have any problems figuring out how to select a particular category to describe your/name's degree?

♦ If Q6 has only one field of degree marked:

    Ask: Do/Does [you/name) have more than one major? More than one bachelor's degree?

      If Yes: Tell me a little about why you didn't answer Yes to more than one category in order to represent multiple bachelor's degree or double major.

♦ If Q6 has more than one field of degree marked:

    Ask: I noticed you picked more than one category. Can you tell me more about that?

♦ For anyone with graduate degree(s):

    Ask: I noticed (re-read Q5 - educational attainment question, if necessary) you indicated [you have/name has] a graduate degree. In what major field is that graduate degree?

    Re-read Q6. Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

♦ For all persons:

    Ask: The last category in the question asks about "some other major field". What does "some other major field" mean to you?   Can you give me some examples of the types of degrees that might fall into this category?

♦ If "Yes" for "Some other major field" in Q6:

    Ask: Why did you choose the "Some other major field" category for (your/name's) bachelor's degree field?

    Ask: Did you consider any of the listed categories before choosing the "Some other major field" category?

♦ For all persons:

    Ask: When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

♦ **<u>After</u> above probes have been asked for <u>all</u> persons with bachelor's degree and higher, administer the following:**

   We are testing two other versions of this question. Using these other versions of the question, I would like to ask you now to answer the questions for [you/name].

♦ Administer Version B Q6 first for each eligible person and have respondents answer before administering Version C Q6. Once you've completed administration of Version B, ask Version C for each eligible person.

♦ ****If warranted, ask respondent any of the relevant probes above (specific to responses to alternate Version B and/or Version C). ****

♦ All Persons:

   Ask: Do you have a preference for a particular version of the question?

      If yes: Tell me a little about why you prefer that version.

CAPI

VERSION B

American Community Survey

Field of Degree Question

Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interview can be obtained from the authors of this report.)

FIELD OF DEGREE QUESTION

Q6. ♦ **If highest degree completed is greater than Bachelor's degree, read:**

The next question focuses on your/this person's bachelor's degree.

Did [you/this person] receive [your/his/her] bachelor's degree in any of the following major field or fields:

		Yes	No
a.	Biological, agricultural or related sciences?	☐	☐
b.	Health, nursing or medical fields?	☐	☐
c.	Computer, mathematical or related sciences?	☐	☐
d.	Engineering?	☐	☐
e.	Physical or related sciences, including earth sciences?	☐	☐
f.	Psychology, economics or other social sciences, except history?	☐	☐
g.	History, arts or humanities?	☐	☐
h.	Business or management?	☐	☐
i.	Education?	☐	☐
j.	Some other major field?	☐	☐

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this</u> <u>question was answered.</u>)

➢ In your own words, what is this question asking?

➢ How did you arrive at your answer for the field of [your/names'] bachelor's degree?

➢ The question asks: (READ QUESTION STEM). What does "major field or fields" mean to you in this question?

GENERAL PROBES (To be asked after the field of degree question is asked of each eligible person):

➢ How did you come up with that answer?

➢ Tell me more about that.

➢ I noticed that you hesitated. Tell me what you were thinking.

RETROSPECTIVE PROBES (To be asked at the end of the interview after all questions have been asked of all eligible household members.)

Universe: Persons in household with a bachelor's degree or higher.

♦ Ask <u>after</u> survey questions have been completed for all persons in the household.

♦ Administer the following series of probes for the Q6 field of degree question for <u>EACH</u> person in the household who has a bachelor's degree or higher.

♦ Reread the field of degree question (Q6) to the respondent..

　Ask: In what specific field or fields did [you/name] receive [your/his/her] bachelor's degree?

♦ For persons who were not <u>first person listed in hhld with a bachelor's degree or higher</u>:

　Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

♦ For all persons:

　Ask: Did you find it difficult to find a category that fit the particular major field of [your/name's] bachelor's degree?

　　If Yes: Tell me about that.

Ask: From the way we presented the response options, did you have any problems figuring out how to select a particular category to describe your/name's degree?

♦ If Q6 has only one field of degree marked:

Ask: Do/Does [you/name) have more than one major? More than one bachelor's degree?

If Yes: Tell me a little about why you didn't answer Yes to more than one category in order to represent multiple bachelor's degree or double major.

♦ If Q6 has more than one field of degree marked:

Ask: I noticed you picked more than one category. Can you tell me more about that?

♦ For anyone with graduate degree(s):

Ask: I noticed (re-read Q5- educational attainment question, if necessary) you indicated [you have/name has] a graduate degree. In what major field is that graduate degree?

Re-read Q6. Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

♦ For all persons:

Ask: The last category in the question asks about "some other major field". What does "some other major field" mean to you? Can you give me some examples of the types of degrees that might fall into this category?

♦ If "Yes" for "Some other major field" in Q6:

Ask: Why did you choose the "Some other major field" category for (your/name's) bachelor's degree field?

Ask: Did you consider any of the listed categories before choosing the "Some other major field" category?

♦ For all persons:

Ask: When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

- **<u>After</u> above probes have been asked for <u>all</u> persons with bachelor's degree and higher, administer the following:**

     We are testing two other versions of this question. Using these other versions of the question, I would like to ask you now to answer the questions for [you/name].

- Administer Version B Q6 first for each eligible person and have respondents answer before administering Version C Q6. Once you've completed administration of Version B, ask Version C for each eligible person.

- ****If warranted, ask respondent any of the relevant probes above (specific to responses to alternate Version A and/or Version C). ****

- All Persons:

     Ask: Do you have a preference for a particular version of the question?

      If yes: Tell me a little about why you prefer that version.

CAPI

VERSION C

American Community Survey

Field of Degree

Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interview can be obtained from the authors.)

FIELD OF DEGREE QUESTION

Q6. ♦ If highest degree completed is greater than bachelor's degree, read:

The next question focuses on your bachelor's degree.

In what specific field or fields did [you/this person] receive [your/his/her] bachelor's degree?

For example, elementary teacher education.

DEGREE FIELD(S):

      _____

      _____

      _____

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered.</u>)

➢ In your own words, what is this question asking?

➢ How did you arrive at your answer for the field of [your/name's] bachelor's degree?

➢ The question asks: (READ QUESTION STEM). What does "major field or fields" mean to you in this question?

GENERAL PROBES (To be asked after the field of degree question is asked of each eligible person.)

➢ How did you come up with that answer?

➢ Tell me more about that.

➢ I noticed that you hesitated. Tell me what you were thinking.

RETROSPECTIVE PROBES (Probes asked at the end of interview after all questions have been asked of all eligible household members.)

Universe: Persons in household with a bachelor's degree or higher.

♦   Ask <u>after</u> survey questions have been completed for all persons in the household.

♦   Administer the following series of probes for the Q6 field of degree question for the respondent. Repeat series of probes for other persons in the household who have a bachelor's degree or higher.

♦   Reread the field of degree question (Q6):

Ask: Did you find it difficult to describe your/this person's particular specific field of degree?

    If Yes: Tell me a little about that.

Ask: Did the example (elementary teacher education) help explain what level of detail we were asking for?

Ask: Do/Does [you/name] have more than one bachelor's degree or have a double major?
    If Yes: Did you list all the fields for [your/name's] multiple bachelor's degree or double major? If not, then why?

♦   For anyone with graduate degree:

Ask: I noticed in Q5 (re-read Q5, if necessary) you indicated [you have/name has] a graduate degree. What did you get your graduate degree in?

Re-read Q6.   Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

♦   For all persons:

Ask: When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

♦ **After above probes have been asked for all persons with bachelor's degree and higher, administer the following:**

♦ For all Version C cases: Half of the cases will be assigned presentation of alternate Version A Q6 and the other half will be assigned presentation of alternate Version B Q6.

Read: I have another version of this question which we are testing. I would like to ask you now to answer this question for [you/name].

♦ Administer either Version A Q6 or Version B Q6, as assigned, for each eligible person.

♦ READ: "The next series of questions I have will be about this alternate version of the question you just answered."

Ask: When answering this alternate version, did you find it difficult to find a category that fit your/this person's particular major field of degree?

If Yes: Tell me a little about that.

♦ Only for the first person debriefing questions are asked about:

Read: The question asks: (READ ALTERNATE Q6 STEM). What does "major field or fields" mean to you in this question?

♦ All Persons:

Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

From the way we presented the response options, did you have any problems figuring out how to select a particular category to describe you/name's degree?

♦ If alternate Q6 has only one field of degree marked:

Ask: Do/Does [you/name) have more than one major? More than one bachelor's degree?

If Yes: Tell me a little about why you didn't answer Yes to more than one category in order to represent multiple bachelor's degree or double major.

♦ If alternate Q6 has more than one field of degree marked:

Ask: I noticed you picked more than one category. Can you tell me more about that?

♦ For anyone with graduate degree(s):

Ask: I noticed in Q5 (re-read Q5, if necessary) you indicated [you have/name has] a graduate degree. What did you get your graduate degree in?

♦ Re-read ALTERNATE Q6.

Ask: When answering this question, were you thinking of [your/name's] graduate degree or [your/name's] major field for [your/his/her] bachelor's degree?

♦ All Persons

Ask: The last category in the question asks about "some other major field". What does "some other major field" mean to you?   Can you give me some examples of the types of degrees that might fall into this category?

♦ If "Yes" For "Some other major field" in alternate Q6,

Ask: Why did you choose the "Some other major field" category for your/name's) bachelor's degree field?

Did you consider any of the listed categories before choosing the "Some other major field" category?

♦ All Persons

When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

♦ All Persons:

Ask: Do you have a preference for a particular version of the question?

If yes: Tell me a little about why you prefer that version.

Self-Administered Questionnaire
Version A
American Community Survey
Field of Degree
Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interview can be obtained from the authors.)

FIELD OF DEGREE QUESTION

Q11. **This question focuses on this person's bachelor's degree. Did this person receive his/her bachelor's degree(s) in any of the following major fields:**

	Yes	No
a. **Biological, agricultural, physical or related sciences?**	☐	☐
b. **Health, nursing or medical fields?**	☐	☐
c. **Engineering, computer, mathematical or related sciences?**	☐	☐
d. **Psychology, economics, or other social sciences, except history?**	☐	☐
e. **History, arts or humanities?**	☐	☐
f. **Business or education?**	☐	☐
g. **Some other major field?**	☐	☐

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered.</u>)

➢ In your own words, what is this question asking?

➢ How did you arrive at your answer for the field of [your/name's] bachelor's degree?

➢ The question asks: (READ QUESTION STEM). What does "major fields" mean to you in this question?

GENERAL PROBES: (To be asked after the FOD question is asked of each eligible person):

➢ How did you come up with that answer?

➢ Tell me more about that.

➢ I noticed that you hesitated before putting down an answer. Tell me what you were thinking.

OBSERVATIONS (To be noted <u>AFTER</u> Q11 has been answered for all eligible HH members):

➢ Note if the respondent has any trouble answering the field of degree (Q11) for any people in the household.

➢ Probe any difficulty answering the field of degree (Q11) or if respondent changes any answers.

RETROSPECTIVE PROBES (Probes asked at the end of interview after all questions have been asked of all eligible household members.)

Universe: Persons in household with a bachelor's degree or higher.

◆ Ask <u>after</u> survey questions have been completed for all persons in the household.

◆ Administer the following series of probes for the Q11 field of degree question for <u>EACH</u> person in the household who has a bachelor's degree or higher. Go through question series for each person before asking about the next person for whom the probes may apply.

◆ Redirect respondent to the field of degree question (Q11).

Ask: In what specific field or fields did [you/name] receive [your/his/her] bachelor's degree?

◆ For persons who were not <u>first person listed in hhld with a bachelor's degree or higher:</u>

 Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

◆ For all persons:

Ask: Did you have any difficulty finding a category in Q11 that fit the particular major field of [your/name's] bachelor's degree?

If Yes: Tell me about that.

Ask: From the way the fields of study categories are presented on the questionnaire in Q11, did you have any problems figuring out how to select a particular category to describe [your/name's] degree?

◆ If Q11 has only one field of degree marked:

Ask: [Do you/Does name] have more than one bachelor's degree or have a double major?

If Yes: Tell me a little about why you didn't answer "yes" to more than one category in Q11 in order to represent multiple bachelor's degree or double major.

◆ If Q11 has more than one field of degree marked:

Ask: I noticed you marked "yes" to more than one category in Q11. Can you tell me more about that?

◆ For anyone with graduate degree(s):

Redirect respondent to Q10 and ask: In Q10, I noticed you indicated [you have/name has] a graduate degree. In what major field is that graduate degree?

Redirect respondent to Q11 and ask: When answering Q11, were you thinking of the major field for [your/name's] graduate degree or major field for [your/his/her] bachelor's degree?

◆ (Ask only once):

Ask: The last category in Q11 asks about "some other major field". What does "some other major field" mean to you? Can you think of some examples of the degree fields that might fall into this category?

◆ If "yes" for "Some other major field" in Q11:

Ask: Why did you choose the "Some other major field" category for [your/name's] bachelor's degree field?

Ask: Did you consider any of the listed categories before choosing the "Some other major field" category?

◆ For all persons:

Ask: When answering Q11, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

PRESENTATION OF ALTERNATIVE FIELD OF DEGREE QUESTION.

◆ After above probes have been asked for all persons with bachelor's degree and higher, administer the following:

We are testing two other versions of this question. Using these other versions of the question, I would like to ask you now to answer the questions for [your/name's] bachelor's degree.

◆ Provide respondent with copies of Version B Q11 first for each eligible person and have respondents answer before administering Version C Q11.

◆ READ: "The next series of questions I have will be about this alternate version of the question you just answered."

◆   Ask respondent any of the relevant retrospective probes specific to alternate Version B.

◆   Once respondent has completed Version B Q11 for each eligible person, present Version C Q11 and have respondent complete for each eligible person.

The alternate Q11 asks: (READ QUESTION STEM). What does "specific fields" mean to you in this question?

◆   For all persons using alternate version - Version C:

Redirect respondent to the Version C Q11:

Ask: When answering this question in the alternate version, did you have any difficulty listing [your/this person's] particular specific field of degree of [your/name's] bachelor's degree?
If Yes: Tell me a little about that.

Ask: Did the example (elementary teacher education) help explain what level of detail we were asking for?

If R or HHLD member had more than one bachelor's degree or have a double major:

Ask: Did you list all the fields for [your/name's] multiple bachelor's degrees or double major? If not, then why not?

◆   All Persons:

Ask: Do you have a preference for a particular version of Q11?

If yes: Tell me a little about why you prefer that version.

Self-Administered Questionnaire
Version B
American Community Survey
Field of Degree
Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interview can be obtained from the authors.)

FIELD OF DEGREE QUESTION

Q11. **This question focuses on this person's bachelor's degree. Did this person receive his/her bachelor's degree(s) in any of the following major fields:**

		Yes	No
a.	**Biological, agricultural, or related sciences?**	☐	☐
b.	**Health, nursing or medical fields?**	☐	☐
c.	**Computer, mathematical or related sciences?**	☐	☐
d.	**Engineering?**	☐	☐
e.	**Physical or related sciences, including earth sciences?**	☐	☐
f.	**Psychology, economics, or other social sciences, except history?**	☐	☐
g.	**History, arts or humanities?**	☐	☐
h.	**Business or management?**	☐	☐
i.	**Education?**	☐	☐
j.	**Some other major field?**	☐	☐

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered</u>.)

➢ In your own words, what is this question asking?

➢ How did you arrive at your answer for the field of [your/name's] bachelor's degree?

➢ The question asks: (READ QUESTION STEM). What does "major fields" mean to you in this question?

GENERAL PROBES (To be asked after the FOD question is asked of each eligible person.)

➢ How did you come up with that answer?

➢ Tell me more about that.

➢ I noticed that you hesitated before putting down an answer. Tell me what you were thinking.

OBSERVATIONS (To be noted <u>AFTER</u> Q11 has been answered for all eligible HH members.)

➢ Note if the respondent has any trouble answering the field of degree (Q11) for any people in the household.

➢ Probe any difficulty answering the field of degree (Q11) or if respondent changes any answers.

RETROSPECTIVE PROBES (Probes asked at the end of interview after all questions have been asked of all eligible household members.)

Universe: Persons in household with a bachelor□s degree or higher.

◆ Ask <u>after</u> survey questions have been completed for all persons in the household.

◆ Administer the following series of probes for the Q11 field of degree question for <u>EACH</u> person in the household who has a bachelor's degree or higher. Go through question series for each person before asking about the next person for whom the probes may apply.

◆ Redirect respondent to the field of degree question (Q11).

Ask: In what specific field or fields did [you/name] receive [your/his/her] bachelor's degree?

◆ For persons who were not <u>first person listed in hhld with a bachelor's degree or higher:</u>

Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

◆ For all persons:

Ask: Did you have any difficulty finding a category in Q11 that fit the particular major field of [your/name's] bachelor's degree?

If Yes: Tell me about that.

Ask: From the way the fields of study categories are presented on the questionnaire in Q11,

did you have any problems figuring out how to select a particular category to describe [your/name's] degree?

◆ If Q11 has only one field of degree marked:

Ask: [Do you/Does name] have more than one bachelor's degree or have a double major?

If Yes: Tell me a little about why you didn't answer "yes" to more than one category in Q11 in order to represent multiple bachelor's degree or double major.

◆ If Q11 has more than one field of degree marked:

Ask: I noticed you marked "yes" to more than one category in Q11. Can you tell me more about that?

◆ For anyone with graduate degree(s):

Redirect respondent to Q10 and ask: In Q10, I noticed you indicated [you have/name has] a graduate degree. In what major field is that graduate degree?

Redirect respondent to Q11 and ask: When answering Q11, were you thinking of the major field for [your/name's] graduate degree or major field for [your/his/her] bachelor's degree?

◆ (Ask only once):

Ask: The last category in Q11 asks about "some other major field". What does "some other major field" mean to you?   Can you think of some examples of the degree fields that might fall into this category?

◆ If "yes" for "Some other major field" in Q11:

Ask: Why did you choose the "Some other major field" category for [your/name's] bachelor's degree field?

Ask: Did you consider any of the listed categories before choosing the "Some other major field" category?

◆ For all persons:

Ask: When answering Q11, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

PRESENTATION OF ALTERNATIVE FIELD OF DEGREE QUESTION.

◆ <u>After</u> above probes have been asked for <u>all</u> persons with bachelor's degree and higher, administer the following:

> We are testing two other versions of this question. Using these other versions of the question, I would like to ask you now to answer the questions for [your/name's] bachelor's degree.

◆ Provide respondent with copies of Version A Q11 first for each eligible person and have respondents answer before administering Version C Q11.

◆ READ: "The next series of questions I have will be about this alternate version of the question you just answered."

◆ Ask respondent any of the relevant retrospective probes specific to alternate Version A.

◆ Once respondent has completed Version A Q11 for each eligible person, present Version C Q11 and have respondent complete for each eligible person.

The alternate Version C Q11 asks: (READ QUESTION STEM). What does "specific fields" mean to you in this question?

◆ For all persons using alternate version - Version C:

Redirect respondent to the Version C Q11:

> Ask: When answering this question in the alternate version, did you have any difficulty listing [your/this person's] particular specific field of degree of [your/name's] bachelor's degree?
> If Yes: Tell me a little about that.
>
> Ask: Did the example (elementary teacher education) help explain what level of detail we were asking for?
>
> If R or HHLD member had more than one bachelor's degree or have a double major:
>
> Ask: Did you list all the fields for [your/name's] multiple bachelor's degrees or double major? If not, then why not?

◆ All Persons:

Ask: Do you have a preference for a particular version of Q11?

> If yes: Tell me a little about why you prefer that version.

Self-Administered Questionnaire
Version C
American Community Survey
Field of Degree
Cognitive Interviewing Project Protocol Probes

(Note: Displayed below is only the field of degree question and the associated probes used during the cognitive interviews. The complete cognitive interview protocol which contains all the survey questions used in the cognitive interview can be obtained from the authors.)

FIELD OF DEGREE QUESTION

> Q11. **This question focuses on this person's bachelor's degree. In what specific fields did this person receive his/her bachelor's degree(s)?**
>
> **For example, elementary teacher education.**
>
> **DEGREE FIELD(S):**
>
> _____
>
> _____
>
> _____

QUESTION SPECIFIC PROBES (To be asked <u>only for the first person for whom this question was answered</u>.)

➢ How did you arrive at your answer for the field of [your/names'] bachelor's degree?

➢ The question asks: (READ QUESTION STEM).

➢ What does "specific fields" mean to you in this question?

GENERAL PROBES (To be asked after the Field of Degree question is asked of each eligible person)::

➢ How did you come up with that answer?

➢ Tell me more about that.

➢ I noticed that you hesitated before putting down an answer. Tell me what you were thinking.

OBSERVATIONS (To be noted <u>AFTER</u> Q11 has been answered for all eligible HH members):

- ◆ Note if the respondent has any trouble answering the field of degree (Q11) for any people in the household.
- ◆ Probe any difficulty answering the field of degree (Q11) or if respondent changes any answers.

RETROSPECTIVE PROBES (Probes asked at the end of interview after all questions have been asked of all eligible household members.)

Universe: Persons in household with a bachelor's degree or higher.

Ask <u>after</u> survey questions have been completed for all persons in the household.

Administer the following series of probes for the Q11 field of degree question for <u>EACH</u> person in the household who has a bachelor's degree or higher. Go through question series for each person before asking about the next person for whom the probes may apply.

♦ For persons who were not first person listed in hhld with a bachelor's degree or higher:

 Ask: How did you arrive at your answer for the field of [your/names'] bachelor's degree?

♦ For all persons:

Redirect respondent to the field of degree question (Q11):

Ask: Did you have any difficulty listing [your/this person's] particular specific field of degree of [your/name's] bachelor's degree?
If Yes: Tell me a little about that.

Ask: Did the example (elementary teacher education) help explain what level of detail we were asking for?

Ask: [Do you/Does name] have more than one bachelor's degree or have a double major?

If Yes: Did you list all the fields for [your/name's] multiple bachelor's degrees or double major? If not, then why not?

♦ For anyone with graduate degree:

Redirect respondent to Q10 and ask: In Q10, I noticed you indicated [you have/name has] a graduate degree. What field is that graduate degree in?

Redirect respondent to Q11 and ask: When answering Q11, were you thinking of the major field for [your/name's] graduate degree or major field for [your/his/her] bachelor's degree?

♦ For all persons:

Ask: When answering this question, were you thinking about anything other than (your/name's) actual field of degree, such as (your/name's) occupation?

◆   All Persons:

Ask: Do you have a preference for a particular version of Q11?

If yes: Tell me a little about why you prefer that version.

VERBATIM PARAPHRASES FOR FIELD OF DEGREE QUESTION (Q11)

CATI/CAPI Participants

1-TB   "Type of education specialization of study"

2-TB   "What my degree was – my undergraduate degree."

3-TB   "What's your major. What was your major in undergraduate studies – your area of concentration."

4-TB   "Main focus of study... what you received your degree in".

5-TB   "Field, career"

6-TB   "What's my major – what was my major in my degree... if you said 'what was my major' that would be more straightforward" [so that's how you interpret those words, "field or fields"?] "yeah; it's not hard to understand"

7-TB   "The field, her studies"

8-TB   "What discipline my bachelor's was in." R started to say "field" , but changed her mind. She said field refers to "work related areas" whereas "discipline" refers to "academic areas".

9-TB   "About my major in college - seeing what I got my bachelor's in."

10-TB   "It's asking for my major."

11-TB   "To categorize my educational background for my bachelor's degree, my major field of study."

13-TB   "What is your major field of study"

SAQ Participants

1   "In this question it wanted to know what's (inaudible) courses are closest to my profession to my degree and that happens to be civil engineering for me so it was very clear."

2   "What was your major"

3   "What I got my bachelor's degree in."

4   "In which field this person has received degrees in"

5   "What the field of studies was the bachelors degree or the major."

6   "Basically what specific field or degree conferred"

7   "What the person majored in

8   "It's just asking me what general field my bachelors's degree was in."

9   "It's asking me, um, what major did I study in."

10 " Um I guess it just wants to know what did you study. What did you get your bachelor's degree in. Um, since it's kind of ambiguous whether I would just put like electrical engineering, the broader field, or whether I should put electrical engineering specializing in circuitry or something like that. Since there's doubt, I'm proud of what I did so I would just put everything."

12 "They're asking you if you got a bachelor's degree what you majored in."

13 "What field did she get her degree in."

14 'What I majored in as an undergraduate."

15 "It's asking me if my bachelors degree which is in chemistry was in any of the fields that they list here, and as I look down at the fields, I could see that the first one asked about physical or related sciences which is what my degree was in."

16 "Basically how many different fields do people have in their concentrations, in their majors or minor, mostly their majors...what they are majoring in, what folks actually utilize their education for."

17 "...if you went to college, what you majored in."

18 "What the person majored in and what they received their degree in."

19 "What field of degree he received [his degree] in… what area."

20 "This is related to my educational background and training."

21 "Well you're trying to figure out what I studied in college."

22 "What area I got my degree in." and "What the diploma says."

3 "What was his field of study in college" (in reference to P1)

3 "It's asking what was my major (pause)what was my bachelors degree... it's pretty straight forward, I don't know how to say it in any other way."

25 "Name of her [roommate's] bachelors degree", meaning the department from which her roommate got her degree."

26 "You are asking me in which particular field of study I was awarded my bachelors degree."

27 "They want to know what your bachelors degree is, "... and since I got my bachelors degree in Biology I could've stopped reading there, but I was curious as to what else you listed here."

29 "If you went to college, what did you major in.... what did you get your degree in."

30 "Q11 is asking me what was the fields of my studies for my bachelor's degree

RESPONDENTS INTERPRETATION OF "MAJOR FIELD(S)"
(As used in FOD Question Version A and B)

CATI/CAPI Participants

1-TB   "A stratification of types of knowledge. Different focuses. They are all fields of learning. I suppose it could imply different basis of training."

2-TB   "A general category, like social science." She did not consider psychology a major field.

3-TB   "Areas of Academia. Different disciplines of the social sciences or hard sciences."

5-TB   "A person's studies and what the person graduated in."

8-TB   "What I majored in."

9-TB   "Um, oh my god, it's asking what I specialized in, in terms of which field do I belong to, science or whatever."

10TB: "Well I think that would cover people who have double majors or interdisciplinary majors." "Some colleges have majors such as sports medicine which covers everything from physical education to physiology, so you combine several areas of study to get one major."

SAQ Participants

1   "I probably wouldn't worry too much about it unless I couldn't find my profession here, but I would associate it with major faculty at a university. So the College of Engineering or College of Arts and Sciences or College of Education. I would equate that with a field.

2   "Um., major fields?..Um, major subjects. I have no idea." "Your major, what you got your degree in."

3   "The department that granted my degree".

4   "A different category of schooling" or "a different subject of schooling."

5   "What the major was in college"

7   "How they do it in college. Either science, biology, chemistry, business, art, etc."

8   "What major subheading it would fall under." "So you can study something as specific as microbiology, but it's still going to be under the more general field of biology. So they just want a more general subheading of biology."

9   "Hmm... I think it means.. Major fields to me seems like there is usually a 'college' designated in that field and that means there's enough people who like it, or who have attended or graduated, so it's considered major just because it's the most popular or it's where most people seem to gravitate to." Upon probing she reported that her field (anthropology) was in the School of Social Sciences.)

10   "Um, I guess it would be like what can you prove that you studied and that by showing that you completed the requirements of , so the example they give is elementary teacher education. I guess in the example it says "This is a generic." It doesn't say "Specializing in gifted education." So I guess that it's more of a general, a vague... But I would think they would want to know demographically how many people study education versus engineering and then not only that, you know, but since there are so many flavors, you know, just give more information. And I figure if it's too much, then they will just disregard anything I put that is over."

15   "Major ...what my degree says on my bachelor's degree." R also distinguish "major" as opposed to "minors."

16   "Curriculums or your major, your most important part of your study."

17   'To me major fields is kind of a broad lumping of disciplines...categorize your college major into a broad category...it's broader than my major...sort of like social sciences, arts, sciences."

19   "A broad category" . R gave the example of Psychology or Biology being a broad category for a specific type of Psychology or Biology."

20   "If I had at least 20 credit hours in a particular field, then I would call that a 'major field."

21   "I was studying education, with a major concentration in science."

22   "Broad, overarching, general areas – not specific." Although, she did point out that some of the categories were "very specific – i.e. "nursing."" The level of specificity was inconsistent across and within categories (she gave the example of "history" and "humanities.")

23   "The field that would be on your (R stopped) the department from which the degree was awarded I guess."

24   "Major or majors."

27   "When you go to college you have to identify what your major is, and where you place the most emphasis, and in my case it was biology. From the day I walked onto campus until the day I left."

29   "I took it at face value – the field of major study; the designation of your degree. ... I received my degree in medical biology, and so I put "biological sciences"."

30   "Well, that, um, for example I did get a degree in International Economics, but International Economics is not a "major field"; it's part of Economics which is a major field."

RESPONDENTS INTERPRETATION OF "SPECIFIC FIELD(S)"
(As used in the FOD Version C Open-ended Question)

CATI/CAPI Participants

7-TB   "The person's specific career, a profession"

13-TB   "Course of study that a person selected to concentrate on to take courses"

SAQ Participants

6   "People have multiple fields...what course work, what is your education centered around"

12   "Sometimes people have double majors, so then you'd list them both. I don't know what you'd do if you have a minor – probably list them both."

13   "They don't want a general degree, they want specifics."

14   "I think that meant history...... for example, elementary teacher education, be specific. So I won't say "education," that would be too vague. Since history is my field, that is specific, my bachelor's is kind of generic, so history is the specific field." R rephrased specific fields as "Academic discipline."

18   "What was on my diploma. I based it on my major." R thinks "specific field" and "major" have the same meaning.

25   "Generalized term for your area of expertise". She went on to say that it is an "umbrella term" for a specific focus. For example, " "chemistry" would be the specific field for someone who may have had a concentration in "analytical chemistry."

26   "At my university you may get a degree – a BA, a BS – and within those degree categories come many schools, institutes, or colleges within the university who is awarding the degree. My degree was awarded by Arts & Sciences, so that's what's on the diploma." "That's the field where I received my bachelors degree; "I was a speech major, but people

in the speech program also had to take 15 credits in radio & tv, so when you graduated ... your department awarded you a Bachelor of Arts in radio, tv, and speech. Just writing BA gives no indication of what my training was."

Bachelor's Degree Major by Categorization (Vers. A and B) and Write-In Entry (Vers. C) by Mode, Version, Proxy Status and Highest Degree of Respondent

Mode CATI CAPI SAQ Version A B C	Bachelors Major (Reported in Retrospective Probing.) ( ) = # of majors	Category Selected for Vers ion A or B or Write-in entry for Vers C	Resp (R) Proxy (P) Unrel to R (U)	Educ Level Highest Degree Attained	A L T. V e r	Category Selected for Alternative A or B (Same = same as original report)	Alternative C "write-in"	C A S E I D
CATI - A	Life Sciences (1)	Bio, agric, phys or rel. sci. AND Hlth, nurs or medical fields	R	PhD	B	Same	Life sciences Biological sciences	11-TB
	Chemistry	Bio, agric, phys or rel sciences.	P	PhD		Same	Biochemistry	
CATI - A	Hum Dev & Fam Stud (1)	Psych, econ or other social sci....	R	PhD	B	Same	Human Dev & Family Studies	8-TB
	History	History, arts or humanities	P			Same	History	
CATI - A	Socy and Polit Sci. (2)	Psych, econ, or other social sci.....	R	Bachelors	B	Psych, econ, or other soc sci.....	Sociology and Political Science	4-TB
	Biology	Bio, agric, phys or rel sciences	P/U	Masters		Bio, agric or rel sciences	Biology	
	Education	Business or education	P/U	Bachelors		Education	Education	
	Sociology	Psych, econ or other social sci.....	P/U	Bachelors		Psych, econ or other soc sci.....	Sociology	
	Communications	Psych, econ, or other social sci....	P/U	Bachelors		Psych, econ or other soc sci.....	Communications	

CATI - B	Journalism (1)	Psych, econ, or oth soc sci... AND SOMF (later said Humanities)	**R**	Masters	A	Not administered	Journalism	12-TB
	Biology	Bio, agric, or related sci AND Hlth, nurs, or medical fields	PU	Bachelors	A	Not administered	Biology	
CATI - B	Business AND Mgmt Info Syst (2)	Comp, math or related sci AND Business or mgmt	**R**	Bachelors	A	Engin, comp, math or related sciences	Management Information Systems AND Business	9-TB
	Computer Sci (1)	Comp, math or related sci AND Engineering	P	Bachelors		Eng, comp, math or related sciences	Computer Science	
	Biology (1)	Bio, agric, phys or rel sci AND Health, nursing or med fields	P	Bachelors		Bio, agric, phys, or rel sciences	Biology	
CATI - C	Political Science	Political Science	**R**	Law Degr	B	Psych, econ, or oth social sci....	NA	10-TB
	English	English	P	Law Degr		Hist, arts, or humanities	NA	
CATI - C	Computer science major and Bus Admin minor	Major in computer science and minor in business administration	**R**	Bachelors	B	Computer, mathematical or related sciences.	NA	13-TB
	Computer Science with minor in Bus Admin	Bachelors of Science in computer science with a minor in Business Administration	P	Bachelors		Computer, mathematical or related sciences.	NA	
CAPI - A	History	History, arts, or humanities	**R**	PhD	B	Same	History	1-TB
	NA (went from HS to Med School - no B.S.)	NA	P	PhD and MD		NA - didn't get a B.S.	NA - didn't get a B.S.	

CAPI - B	Fine Arts	History, arts or humanities	P	**R** had High School Educ Level. Person in this row has Bachelors		Same	Fine arts	5-TB
	Accounting	SOMF	P	Bachelors		Same	Accounting	
	Biology	Bio, agric, or related sciences	P	Bachelors		Same	Biology	
CAPI - B	Psychology	Psych, econ or other social sci.....	**R**	PhD	A	Same	Psychology	2-TB
CAPI - C	Business. Admin, AND Accting and Econ (2)	No, it's in admin, accting, economic.	P	**R** had High School Educ Level. Person in this row has Bachelors	B	Comput, math, or rel sci AND Psych, econ, or oth soc sci.. AND Business or management	NA	7-TB
CAPI - C	Accounting	Accounting	**R**	Bachelors	A	Business or education	NA	6-TB

CAPI - C	Economics	Economics	**R**	Bachelors	B	Psych, econ, or oth soc sci.....	NA	3-TB
	Psychology	Psychology	P/U			Psych, econ, or oth soc sci...	NA	
	Chem and Bio (2)	Chemistry and Biology	P/U			Bio, agric and related sciences	NA	
	Economics	Economics	P/U			Bio, agric and related sciences	NA	
	Engineering	Engineering	P/U			Engineering	NA	
SAQ -A	Chemistry	Bio, agric, phys, or rel sciences	**R**	PhD	B	Phys or rel sci, incl earth sci.	Chemistry major and Biology minor	20
SAQ -A	Biology	Bio, agric, phys, or rel sciences	**R**	Masters	B	Bio, agric or related sciences	Biology	27
	English	History, arts or humanities	P/U	Masters		Same	English	
SAQ -A	Engineering	Engin, comp, math, or rel sciences	**R**	PhD	B	Engineering	Civil Engineering	1
	Social Work	Psych, econ, or other social sci.....	P	PhD		Same	Social Work	
SAQ -A	Family Studies	Psych, econ, or other social sci.....	**R**	Bachelors	B	Same	Family Studies	2
	??Education???	Business or education	P/U	Masters			"Education??"	
	DK	Left Q11 Blank (DK)	P/U	Bachelors		Hlth, nurs, or med fields	"Health-related??"	
	DK	Left Q11 blank (DK)	P/U	Bachelors		Left Q11 blank (DK)	Unknown	
SAQ -A	Geology	Bio, agric, phys, or rel sciences	**R**	PhD	B	Phys or rel sci, incl earth sci	Geology	22
	Latin and Biology (2)	Some other major field (SOMF)	P	Masters		Same	Latin and Biology	

SAQ -A	Journalism	SOMF	**R**	Bachelors	B	Same	Bachelor's of Art in Journalism	7
SAQ -A	Business Mgmt	Business or education	P/U	Bachelors	B	Business or Managment	Business Administration (Management)	19
	Biomed Engineer	Engin, comput, math, or rel sci	**R**	Bachelors		Engineering	Biomedical Engineering	
	DK	blank	P/U	Bachelors		DK	DK	
SAQ -A	Chemistry	Bio, agric, phys, or related sci	**R**	PhD	B	Marked same, but realized it shld be "Phys or rel sci….."	B.S. Chemistry	15
SAQ -A	Education	Business or education	**R**	PhD	B	Education	Education related courses	16
SAQ -A	Anthropology	Hist, arts or humanities (but during retro probing, changed to Psych, econ, or other soc sci…)	**R**	Bachelors	B	Psych, econ, or oth soc sci…	Anthropology	9
	DK -theater-related	Hist, arts or humanities	P/U	Masters		Same	"Theater???"	
	Photography	SOMF	P/U	Bachelors		Same	"Photography???"	
SAQ - B	Education	Education	**R**	Masters	A	Business or Education	Bachelor of Science in Secondary Education	21
	Philosophy	History, arts, or humanities	P	Masters		Same	B.A. in Philosophy	

SAQ - B	Medical Biology	Bio, agric, or related. sciences	**R**	PhD	A	Same	Medical Biology	29
	Bio and Chem (2)	Bio, agric, or related. sciences	P	PhD		Same		
SAQ - B	Geology	Phys or rel sciences, incl earth sciences	**R**	PhD	A	Bio, agric, phys or related sci.	Geology	17
	Sociology AND Philosophy (2)	Psych, econ or oth soc sciences.....	P	PhD		Psych, econ or other soc sci.... AND Hisotry, Arts, or Humanities	Sociology, Philosophy	
SAQ - B	General Studies with emphasis in Education	Education	**R**	Masters	A	Psych, econ, or oth soc sci.....	General Liberal Arts with concentration in Education.	23
SAQ - B	Biopsychology	Psych, econ or other social sci.....	**R**	PhD	A	Same	Biopsychology	8
SAQ - B	Intl Economics	Psych, econ, or other social sci....	**R**	Masters	A	Same	Economics	30
SAQ - B	Psychology	Psych, econ, or other social sci.....	P	PhD	A	Same	Psychology	5
	Sociology	Psych, econ, or other social sci....	**R**	Masters		Same	Sociology	
SAQ - B	Civil Engineering	Engineering	P	Masters	A	Engin, comput, math, or rel sci	B.S. Civil Engineering	3
	Forestry	SOMF	**R**	Bachelors		Same	B.S. Forest Resource Management	

SAQ - B	Economics	Psych, econ, or other social sci.....	P	**R** had High School Educ Level. Person in this row has Masters	A	Same	Economics	4
	Psychology	Psych, econ, or other social sci....	P	Masters		Same	Psychology	
	English and Intl Relat (2)	History, arts, or humanities	P	Bachelors		Same	Humanities	
SAQ - B	Information Systems	Computer, math or related sci	P	Bachelors	A	Engin, comput, math, or rel sci.	Bachelor's Information System	24
	Sociology	Psych, econ, or other social sci....	**R**	Bachelors		Same	Bachelor's of Science Sociology	
	Computer Science	Computer, math or rel science	P	Bachelors		Engin, comput, math, or rel sci	Bachelor's Computer Science	
	Computer Science	Computer, math or rel science	P	Bachelors		Engin, comput, math, or rel sci	Bachelor's Computer Science	
SAQ - C	History	History	**R**	PhD	A	History, arts, or humanities	NA	14
	History	History	P	Prof. Degr		History, arts, or humanities	NA	
SAQ - C	Mathematics	Mathematics	**R**	Masters	A	Engin, comput, math, or rel sci	NA	12
	Mathematics	Mathematics	P	Masters		Engin, comput, math or rel sci	NA	
	Sociology	Sociology	P	Bachelors		Psych, econ, or oth soc sci...	NA	
	Psychology/chem (minor)	Psychology/Chemistry	P	Bachelors		Psych, econ, or oth soc sci...	NA	

SAQ - C	Biochemistry	Biochemistry	**R**	Masters	A	Bio, agric, phys, or rel sciences	NA	28
SAQ - C	Social Work	Social Work	**R**	Bachelors	A	History, arts, or humanities		6*
	Culinary Mgmt	Culinary Management	P	Bachelors		SOMF	NA	
	Early Chldhd Ed.	Early Childhood Education	P	Bachelors		Business or education	NA	
	Psychology	M.Ed	P	Masters		Business or education	NA	
	Early Chldhld Dev (?) or Educ?	Early Chldhld Dev	P	Bachelors		Business or education	NA	
SAQ - C	Psychology	Psychology	P	**R** had High School Educ Level. Person in this row has Masters .	B	Psych, econ or other soc sci.....	NA	13
SAQ - C	Radio/TV/Speech	Radio/TV/Speech	**R**	Masters	B	History, arts, or humanities		26
	Agric Economics (1)	Agricultural Economics	P	Bachelors		Bio, agric, or rel sci. AND Psych, econ, or other soc sci.....		

SAQ - C	Spanish Literature	BA-Spanish literature with concentration in Latin American and Woman's Studies. Did an informal concentration in European and Film Studies	**R**	Bachelors	B	History, arts or humanities	NA		10
	Operation Research and Indust Engineering (1)	Operations Research and Industrial Engineering	P	Bachelors		Engineering	NA		
	Biochemistry	Biochemistry	P/U	Masters		Bio, agric, or rel sci AND Hlth, nurs, or medical fields	NA		
SAQ - C	English AND Media Studies (2)	English, Media Studies	**R**	Bachelors	B	History, arts or humanities	NA		18
	Media Studies	Media Studies	P/U	Bachelors		History, arts or humanities	NA		
	Media Studies	Media Studies	P/U	Bachelors		History, arts or humanities	NA		
	Nursing	Nursing	P/U	Bachelors		Hlth, nurs, or medical fields.	NA		
SAQ - C	Social Work	Social work	P/U	Masters	B	Psych, econ, or other soc sci...	NA		25
	English	English	P/U	Bachelors		History, arts or humanities	NA		
	Intl. Development	International Development	P/U	Masters		Psych, econ, or oth soc sci...	NA		
	Photography	Photography	P/U	Bachelors		History, arts, or humanities	NA		
	Zoology	Zoology	**R**	Masters		Bio, agric, or rel sciences	NA		

VERSION PREFERENCE

CATI/CAPI Participants

1-TB   The third (Version C) was the quickest and easiest. I didn't have to listen to 7 categories so it saves time. And I'm not potentially hearing "yes" before I hear the specific category. R discussed that the coders would be required and then we'd need staff. Would require another step. R said it would just be a time issue.   R said younger people will probably like having their field listed. It's just time consuming. As a person who agreed to answer it, then I'd prefer for it to be shorter and you just write down what it is. But if that's a burden then that's a problem for the coders.

2-TB   Preferred this version – immediately after answering she said, "That was easy. I like that one". NOTE: Before seeing the Alt Version C, R thought the Version A question was too complicated. She said it would be easier if we just "asked what people got their degree in – instead of all the categories. R said: "[This version - A] was cumbersome. I would have been fine if I had a flashcard."

3-TB   R Preferred Version C because it was "time efficient." He really didn't like the repetition necessary for each category and each person in the HH.

5-TB: R liked Version C because it's easier not having to search for a category and she can write down her actual degree, especially for herself since her sociology degree wasn't spelled out, and it's less effort on her part.

6-TB   "Yes, the direct question [C], because this [A] is too general to me"

7-TB   "Version C is more easy, the second one (Version B) is more complicated and I have to listen." English is a second language, so listening to all the long categories and then having to decide whether or not his wife's two degrees fit is very demanding for R. "I am prepared to answer your question (Version C) and Version B was difficult because they are so different, but then several ones can fit her degrees, I have to listen carefully and choose a category ... this one (Version C) is much faster."

8-TB   "Overall, R preferred Version A, "because it was shorter." R thought B had too many

categories. R indicated that if she had not seen the other categorical versions she probably would have put down HD&FS for her FOD in Version C, but was afraid that no one would know how to code that degree correctly.

9-TB "I think this one, the brief one (Version C) , where you asked me for a specific major."

Why preferred: "Because that way you can just answer. You don't have to read through all the other options, the 10,000 ones that don't apply. You can just write down your answer."

10-TB "Well, I was assuming you were going with the open-ended question first and the closed-ended question only comes into play someone doesn't answer the first one." When I explained we testing to see which 'one' of the different versions works best. R reported "I personally would pick the open-ended one because I think most people remember what they majored in." "Because the categories, you're trying to lump some many different areas of study into ten categories and I think that you'll end up with coding problems. I think you'll end up with coding problems with your open-ended question, but, um, I'm sorry, but I've done a lot of survey work. But I think open-ended is better here in that I think most people will remember."

11-TB [read B] R gave same answers for self and spouse; could not see any difference between A & B. [read C; self] life sciences, biological sciences [easier for you, just to leave it open-ended?] right

[C for spouse] "I would say biochemistry here, but I don't know – that would be harder for me." [categories were easier?] "Yes, because I'm uncertain of the specific field."

12-TB Version C – better for me and for reporting about person 2. Because you don't have any confusion between what is your title and what are you doing – you just ask what is your bachelors degree and you respond.

13-TB R found Version B difficult over the phone because of the long list of categories. Hence, R prefers Version C. However, R thought Version C would have been a better question if we changed the question wording to "What was your major in college?" "Because in college, these are called majors, not fields.... It's annoying that they are asking specific field or fields instead of my major(s). It sounds like a stupid question, everyone in college calls it a major, no one calls it fields...I wonder who made up something like that'. R actually asked who wrote these questions later. She also found the example provided in Version C slightly confusing because she had never studied in the education program. For her, she thinks only example from her major would be helpful.

SAQ Participants

1   "If I were to fill it out, I'd like to be specific and write it in (Version C). But I also have a lot of data, so jumping on the other side of the fence, people could write in a lot of stuff which could become a nightmare. So thinking along those lines, then those are more two answers. I'd be as specific as I can cause I'm in a traditional profession and so is my wife, but a lot of people don't have traditional professions or degrees."

2   R preferred Version C (open-ended) because then she could put her question marks for her responses to her roommate's major field which she was uncertain about. Pertaining to her own degree, she preferred Version A or B, because "social sciences" is more recognizable. She then said she preferred Version B over A because Education was broken out by itself.

3   R thought that Version C "was much more comfortable to answer (for herself) because I knew exactly what my field of study was." It seemed easier for her to put down a specific response rather than trying to find a category. She had the same preference (Version C for her husband, too).

4   R thought this version could be "the most confusing" because he didn't know what a field was and didn't know how to answer the question. He also indicated that this version would be hard to code. That someone would have to "fit [the responses] into these categories, anyway."

5   R liked Version C because it's easier not having to search for a category and she can write down her actual degree, especially for herself since her sociology degree wasn't spelled out, and it's less effort on her part.

6   When filling out the alternate A form he had a lot of difficulty. He found Version A "more work." But he prefers Version A for himself because he thinks it is more "inclusive, more in-depth." However, he apparently has checked the wrong category for his social work degree ("e-history, arts, or humanities." For his wife, he also prefers Version A because of the listed category "other major fields." He is more comfortable having a category to choose from than what he has written out in Version C. During the probes, he realized he checked the wrong box for person 4 (his son). He checked a field for his masters degree- "his last degree" instead. He found Version A easier than Version C overall, but he is upset he has marked the wrong box for his son. In fact, he put down the wrong degree for person 4 also in Version C. In terms of response accuracy, R made more errors filling out Version A, selecting wrong categories for his degree and checking both yes and no boxes for some categories.

7   R preferred Version A (the original version). She thought version B was "too wordy" because it "asks about sciences over and over again." She thought version C of the question was "asking what the degree was … and not necessarily what you majored in." – Which is why I think she specifically put "bachelor's of art". R recommended that Version C be "broken down" to elicit both degree and major. She found version C to be confusing because she quickly skimmed the question and didn't really read "specific field." She put down the name of her degree rather than the major.

8   "Um...I like it the way it is (categories), but if I was going to change it, I think the open format is a little bit easier because I think it covers any choices that might not be on here, so the "some other major field," if for some reason there is something out there that is not covered, can be. But that leaves the Census people up to deciding, like when I say biopsychology, is it more biology or more psychology - - Was that from a department of biology or department of psychology and that's kind of hard to tell unless you actually ask. So I think this (Version B) would probably be more accurate for those reasons."

"Version A and Version B are very similar. For some reason, Version B looks like there is more there (visually) because there are additional categories."

9   I think Version A or B because of the fact that when people do this, like me they do it quick to take the least amount of time, And with Version C if my roommate weren't home, I'd put it to the side and never get back to it. But with Version A or B it's more general and I put their degrees in categories, rather than having to be specific.

10   R said for her as the person putting it in she would say Version C, but she would think from our perspective it would be easier to quantify based on Yes/No. To R, the Version C didn't seem as constricting, that she doesn't have to spend as much time going through them and trying to figure out do you want me to put two or to put one. It's (Version C question) more like "What does your degree say?" "It's just more automatic. For all three of us, it's easier for me to do it this way - Version C."

R commented that for the analysts it would be easier to say how many category X we have - "you can quantify it versus this one (version C) which would be more time consuming. Plus different people depending on how schools could call it different things - like is computer engineering the same thing as computer science. How do you specify."

Overall, R's preference was Version C.

12   "This [C] is much easier."   "Because you have to stop and think on this [A], and read every one carefully, and make sure you pick the right category, especially if it's not exactly listed. ... But if you know the answer, then you can just put it right down. It's easier."

13   She prefers Version B because "it will help someone to bring out an answer quicker when the person read all the possible categories....it gives you multiple choice, this is better and easier." When I probe if that's the case for her daughter, she said "In my daughter's case, I prefer this one (Version C) because it is easier (referring to just writing psychology)... but I think this one (Version B) is better. For myself, sometimes when I have more information, it helps me decide." I asked respondent if Psychology was not listed, only social science, which category would she picked for her daughter. She said "g-History, arts, or humanities."

14   Both R and her spouse has a bachelor's degree in history. She had no trouble writing that down in Version C. It was important for R to see that history was listed separately in category "e-history, arts, or humanities." R is a professor in history but her department is listed under college of social sciences. She said she would have chosen category "d-psychology...or other social sciences..." if history was not clearly listed. R prefers Version C. She thinks Version C "seems more straight forward...it takes less time, I don't have to read it all, it gives room to be more specific..." than Version A. Version C "is faster, when I am filling out forms, I think I tend to get a little annoyed for what I perceived as excess...having to go no, no, no, as opposed to writing it more quickly and moving on, it's more preferable."

15   R selected the first category for Version A and selected the same category for Version B also (which is incorrect in his case). "The first one that says "Biological, agricultural, or related sciences" is the one I would check a yes for." -referring to Version B. For Version C, R put down "BS -Chemistry."

      According to R, he had marked the "wrong" box in Version B because he did not pay attention that it's different from version A. During retrospective probes, he noticed he had marked the wrong box for Version B - - "you separated the two fields" referring to the previous physical science and biology category. He realized he should have selected category "e-physical or related sciences..." instead for Version B. These two categories (a and d in Version B) are clearly not mutually exclusive for someone with a Chemistry major. "Chemistry is a physical science but "biological, agricultural or related sciences" listed in category "a" could also mean "Chemistry." For people who spends little time when filling out forms and who have degrees in physical science that's also relates to biology, they may have picked the first category even though the latter category may fit better. Although R said if he had been offered Version B first, he would have glanced through the whole list a bit more carefully and would have selected category "e."

R has no preference on any of the 3 versions, but he sees Version C as easier. "This one is specific, it only requires me to put down information about myself, rather than try to think and translate what you are asking for into my knowledge of things...this version C is the easiest. It didn't ask me to try to understand what the question is asking for and to decide where my information fits. There is more room for error for this and this (Version A & B)...I got to think hard and long about what it is, figure something out (what kind of degree I got) and have to fit my degree in one of these categories/shoebox you have here. This one (Version C) is more straight forward....these forms should be as idiot proof as possible."

16   R prefers multiple choice response and he likes Version B better because there are "more curriculum listed." R preferred more details.

17   R selected category "e-Physical or related sciences, including earth sciences" when filling out Q11 of Version B and selected category "a-Biological, agricultural, physical, or related sciences" when presented with alternate A. She wrote "Geology" for Version C. R prefers Version B since she definitely like seeing the term "earth sciences" in category "e" of Version B. R is also very "survey savvy." "I am looking for government jobs and I filled out forms like these on my education all the time, so I know what to look for."

18   R preferred the open ended because "it was just easier to put what I have my degree in." She thought the categories were "less focused – perhaps making them harder to answer."

19   R thought "for herself," Version C was easiest to answer and preferred that version. However, she was reluctant to choose this version because she was worried that it would be too much work to put in a survey, and opted for Version A as the next best choice.

For her roommate R preferred Version A, "since I don't have to think of the exact degree." R felt she wouldn't have been able to "be as specific" when proxy reporting FOD.

20   "I like this [B] because it's expanded a bit – some people would find that more helpful." Things are "split out." [any of them easier or more difficult?] "No; all about the same."

21   "This one [B] for me, education, that was unambiguous. That was fine." [for spouse?] Not really; not after I had pondered the "other" category. "This one [C] is maybe a little more specific – you say what was the degree in." R notes that C's responses provide the most information.

22 R preferred Version B for herself because she actually saw "Earth Sciences" in the category list. She like seeing "Earth Sciences broken out from" the other categories within that response option. For P2, she felt that "all [versions] were equally vague and not easy to answer." She said Version C, "from your perspective is harder to code." I suspected that she was somewhat basing her preference on this idea that it would be too much work for "us." But R also indicated that she "still had the problem of him having two degrees," which is not implied in the question text. R said, "Although I can put down the two fields, there is nothing that allows for two separate degrees."

23 R's bachelor's, a liberal arts in General Studies degree, makes it difficult for her to fit her degree in the listed categories. She did not consider her major as education but since she has a "concentration" in education (taken more courses from education department but did not major in education), she checked category "(i) Education" in Version B. However, she selected category "(d) Psychology, economics, or other social sciences, except history" when presented with alternate Version A. She circled "social sciences" after checking the "yes" box for category (d). She reasoned that when category F combined "Business or education" in one category, she interpreted and perceived the category differently than when education was a separate category by itself. To her, education by itself is for children K-12 education but when combined with business, she has different interpretation for that category (see Section II). She chose social science "because with a general degree, I felt that social science covered a more broad set of categories .... I don't associate what I did in college in education with business at all, that's how I perceived it."

R put down "General Liberal Arts with concentration in Education" for Version C. R prefers Version C. "For me I like this question better because my degree doesn't necessarily fits one of those major areas very neatly. I like the open ended-ness for being able to specify what I meant. It allows me to put down the most accurate description of my degree." When I asked her if she has thought about choosing "some other major fields" when responding to Version A or B, she said "I did think about it but I want my information to be heard and not just in an "all other" category. "Although if this (some other field category) has a box asking to specify, I would have marked that box and put it my degree."

R is familiar with survey (does survey evaluation on her job) and says either Version A or B would be fine if she gets either form, she can fit her degree in one of the categories though she would choose a different category depending on the Versions provided. When I reassure her not to worry about coding for us (she commented not wanting to code Version C if it was her surveys), she reported that she prefers Version C when reporting her bachelors degree.

24 R had difficulty answering this version (C) of the question. She did not carefully read the questions text, saw "degree fields" written above the blanks, and thought it meant specific type of degree, such as Bachelor of Arts or Bachelor of Science. She did not read the example

and thought the question was asking for something much more specific than just field of study. R did not like this version (C) at all. She prefers to check boxes rather than having to write something in.

25   R preferred the open-ended (Version C) because: "it was more specific." R also said it was easier because "if you hadn't been to college in a while, you might not know where International Development might fit in." R thought it was easier to write in a degree than have to think of the right "general category."

26   R preferred Version B, saying " I am very linear; I want to get to the point. I like yes and no." R also notes that her preference is somewhat related to her work, in which she sometimes designs web-based forms for people to fill out, and in which check-boxes are so much easier to deal with than fill-ins.

27   [Any preference – for you as a respondent, apart from us, the agency collecting the info? Is there one that would be easier for you?] "I have no problem with the first one [A] the way it was. But I would probably prefer the second one [B], because of its greater specificity." R then reconsiders, because the B list is a little too long and unwieldy. "I would definitely not prefer the open-ended one... Yes it's easy, in some ways, for the person filling out the form, but I would never ask a question like this on a survey form.... You are gonna get so many answers where you're gonna have to "guess" what the person meant, "versus you've already limited it down to 7 categories."

28   "Speaking as someone who designs forms, electronically, for websites and the like, it's useful to give people a set of well-defined choices that they can check off." [how about as a respondent, sitting at home?] Either form is adequate, but the list does require, in my example, a few seconds of thought in order to think about the "taxonomy" of my particular school and degree program." [So the list took a little more thought?] "Yes, it was very easy for me just to write down my major, but the list was pretty easy, too, with "biology" right at the top."

29   B is a little frustrating; didn't see it as allowing a report of a second major, or a teaching degree. "Had I seen that it was possible, then I would be comfortable with it." R didn't like "the abbreviated one" [A] because of the way the categories were formed – too many disparate things lumped together, that would not permit a clear expression of his particular field. "The one with the lines was the easiest to fill. It will give the most comprehensive information. It will be harder to interpret, on your end."

30   Well, I would feel more comfortable with Version B because it's got fewer choices. Whenever you see something that's got a long list of choices then you become a little

apprehensive about what you're going to have to do to find the right one, so if you can condense it to three fewer, then it is in fact easier, as long as it does contain the terms that you're looking for. And I guess the psychological predisposition to answer the question is improved when you see something that's shorter than longer.

Opinion about Version C: "Well in my case it's pretty specific what I would answer, but probably it is better for classification purposes to have the choice. I've worked in surveys. So I would never do that (open-ended question) because people can then write whatever the hell they want and then you have to code it. If the classifications are broad enough or narrow enough for the purposes of the survey then I would go with the classifications instead of the open-ended. If you had a lot of "some other major fields" cases, then maybe you would have to go back to this one (open-ended Version C) to capture what is not being captured in these others (classifications). I guess I can't help from looking at it from the survey's point of view. But from the person answering, it would probably be easier for the person to write it out (Version C) then instead of trying to locate the answer here (in the categories). So if I try to put myself away from that mind frame (survey researcher), it would probably be easier to write down whatever I studied. But it depends on the person. Some may prefer to put an "X" than to write something down. "

NSF Final Question Wording for Field of Degree Question
for ACS 2007 Methods Panel Test

<u>Open-ended Format</u>

SAQ Mail Mode

This question focuses on this person's BACHELOR'S DEGREE. Please print below the specific major(s) of any BACHELOR'S DEGREES this person has received. *(For example: chemical engineering, elementary teacher education, organizational psychology.)*

_____

_____

_____

CATI/CAPI Mode

This question focuses on (Name's/your) BACHELOR'S DEGREE. What was the specific major of any BACHELOR'S DEGREES (you/he/she) (have/has) received? *For example, chemical engineering, elementary teacher education, organizational psychology.*

_____

_____

_____

Categorical Format

SAQ Mail Mode

This question focuses on this person's BACHELOR'S DEGREE. In which of the following major fields did this person receive his/her BACHELOR'S DEGREE(S):

Mark (X) "Yes" or "No" box for each category.

		Yes	**No**
a.	Biological, Agricultural, Physical, Earth, or Other Natural Sciences?	☐	☐
b.	Health, Nursing, or Medical Fields?	☐	☐
c.	Engineering, Computer Sciences, or Mathematical Sciences?	☐	☐
d.	History, Arts, or Humanities?	☐	☐
e.	Psychology, Economics, or Other Social Sciences?	☐	☐
f.	Business or Management?	☐	☐
g.	Education or Education Administration?	☐	☐
h.	Some Other Major Field?	☐	☐

(If yes, please specify_____

_____)

CATI/CAPI Mode

This question focuses on (Name's/your) BACHELOR'S DEGREE. In which of the following major fields did (you/he/she) receive (your/his/her) BACHELOR'S DEGREE(S):

Please answer "Yes" or "No" box for each category.

		Yes	**No**
a.	Biological, Agricultural, Physical, Earth, or Other Natural Sciences?	☐	☐
b.	Health, Nursing, or Medical Fields?	☐	☐
c.	Engineering, Computer Sciences, or Mathematical Sciences?	☐	☐
d.	History, Arts, or Humanities?	☐	☐
e.	Psychology, Economics, or Other Social Sciences?	☐	☐
f.	Business or Management?	☐	☐
g.	Education or Education Administration?	☐	☐
h.	Some other major field?	☐	☐

(If yes, please specify_____

_____)