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Demographic Statistical Methods Division Survey Methodology

2021 National Survey of College Graduates Bridge Panel Analysis Report

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The U.S. Census Bureau reviewed this data product for unauthorized disclosure of confidential information and approved the disclosure avoidance practices applied to this release.



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Executive Summary

In parallel to the production sample for the 2021 National Survey of College Graduates (NSCG), the National Center for Science and Engineering Statistics within the National Science Foundation tested new questions and formatting changes for the NSCG using an experimental, non-production sample called the Bridge Panel. The Bridge Panel used a smaller sample compared to NSCG production to determine the effect of proposed question changes and new content on survey response and estimates.

The 2021 Bridge Panel evaluated three types of questions: formatting of a series of Yes/No and rating scale questions, Sexual Orientation and Gender Identity (SOGI) questions, and coronavirus pandemic-related questions. Our goal in testing the format of the Yes/No and rating scale questions was to determine whether the item-by-item format improved usability and data quality compared to grid questions. For SOGI questions, we studied new ways of asking about gender and sexual orientation to complement ongoing SOGI research efforts. Lastly, we sought to measure the impact of the coronavirus pandemic-related questions and response options, which were added to the production instrument, on response distributions and respondent interactions.

In comparing the grid and item-by-item formats, we found that the item-by-item format had higher breakoff rates, more changed answers, and slightly longer completion times than the grid format. However, we also saw that item-by-item format had lower item nonresponse and more "Yes" or positive responses. We would suggest prioritizing lower breakoffs over higher item nonresponse, since the NSCG would lose all the items following a breakoff and likely experience a decrease in the sample persons available for future cycles. Therefore, we suggest continuing to use the grid format for screens greater than or equal to 992-pixels wide, which excludes most smartphones, while also conducting new research to examine the differences in response distributions between the two formats.

The Bridge Panel tested three new SOGI questions (i.e., Birth Sex, Current Gender, and Sexual Orientation) in place of the single production question, "What is your sex?" (i.e., Sex). Other than the collective breakoff rate, the only statistical comparisons that were made were between Birth Sex and Sex. We noticed that Sex asked on the production instrument appeared to capture similar responses as the Birth Sex on the Bridge Panel. We also noticed that there were a notable number of breakoffs on Sexual Orientation but none on the other SOGI questions. We recommend the NSCG use Birth Sex and Current Gender in production and conduct more testing on Sexual Orientation in focus groups or cognitive testing to gain more insight on respondents' reactions and responses to this question. We also note that previous research has recommended having the sex and gender questions on the same screen to provide context and possibly reduce ordering concerns. Therefore, we suggest putting Birth Sex and Current Gender together.

An analysis of new response options about the coronavirus pandemic studied whether adding specific references to the pandemic on the production instrument affected responses. We compared these responses to the Bridge Panel, which did not reference the pandemic. However, the only questions on the production instrument that had direct references to the pandemic and had corresponding questions on the Bridge Panel, were questions formatted as grids. Since we noticed a significant difference between grid and item-by-item formatted questions, we weren't able to make clear conclusions about the effect of the coronavirus references. There was one question on both the production and Bridge Panel that was not a grid that had a different response option, changed because of the increase in virtual conferences and meetings during the pandemic. This question was about professional conference attendance and there was a significantly higher response to "Yes, I attended in person or virtually (i.e., online or by remote access)," as it read on the production instrument, compared to "Yes", as it read on the Bridge Panel. The additional "Yes" responses to the expanded definition to include virtual conferences and meetings captured more attendance from respondents. The rest of the questions referring to the coronavirus pandemic did not have matching questions on the Bridge Panel (e.g., effect on salary and telework questions). Additionally, we reviewed responses to the pandemic-related questions added to the production instrument by mode. Differences were found across mode for almost all questions; however, it was difficult to attribute the differences solely to mode, as other factors, such as self-selection, likely contributed. The purpose of these analyses was to better understand the effect that pandemic references might have had on survey response. Because of confounding and other factors, there were not clear conclusions for most of the pandemic analyses.

This Bridge Panel analysis provided a first look at the effects of changing the format of Yes/No and rating scale questions, testing SOGI questions, and provided additional questions for further research to ensure we continue to provide high quality data and an excellent user experience to survey respondents. For Yes/No and rating scale questions, we suggest continuing to use the grid format and conducting additional analysis to determine respondents' true responses. For the newly proposed SOGI questions, we recommend adding Birth Sex and Current Gender into the production instrument on the same screen and conducting more testing on Sexual Orientation in focus groups or cognitive testing to gain more insight on respondents' reactions and responses to this question.

1. Introduction

The NSCG is a repeated cross-sectional biennial survey conducted since the 1970s. It is sponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF). On behalf of NCSES, under an interagency agreement, the U.S. Census Bureau serves as the data collection contractor for the NSCG. The survey provides data on the nation's college graduates, focusing on those in the Science and Engineering (S&E) workforce. The NSCG examines various characteristics of college-educated individuals, such as occupation, work activities, salary, and the relationship of degree field to occupation (U.S. Census Bureau, 2019).

In parallel to the production sample for the 2021 NSCG, NCSES tested new questions and question formatting for the NSCG using an experimental, non-production sample called the Bridge Panel. The Bridge Panel used a smaller sample to study proposed question changes and new content. The sample included 5,053 cases contacted for the first time during the regular NSCG data collection period. While similar to new cohort cases from the production sample, the Bridge Panel only received web invitations and were not eligible to respond by paper or computer-assisted telephone interview (CATI).

The 2021 National Survey of College Graduates (NSCG) Bridge Panel experiment tested the potential impacts of changing survey questions and using item-by-item formatting in the NSCG. The 2021 Bridge Panel evaluated three types of questions: formatting of a series of Yes/No and rating scale questions, Sexual Orientation and Gender Identity (SOGI) questions, and questions that referred to the coronavirus pandemic.¹ Otherwise, the Bridge Panel included all the same questions and sections as the 2021 new cohort production instrument.

Our goal in testing the format of the Yes/No and rating scale questions was to determine whether the item-by-item format improved usability and data quality compared to grid questions. For SOGI questions, we studied new ways of asking about gender and sexual orientation to complement ongoing SOGI research efforts.² Lastly, we sought to measure the impact of the coronavirus pandemic-related questions and response options, which were added to the production instrument, on response distributions and respondent interactions.

2. Methodology

The following section outlines the research questions and the methodology used to answer them.

Sampling for the 2021 NSCG new cohort production survey had a higher priority than the sampling for the Bridge Panel. In other words, production cases were selected first; then the Bridge Panel selected from the remaining cases on the frame. Due to the prioritized selection process, cases selected into the NSCG new cohort production sample with certainty (i.e., "take all" or "self-representative") are not represented in the Bridge Panel. Approximately 35 percent of the new cohort sample is comprised of certainty cases. To make the NSCG new cohort

¹ The coronavirus pandemic refers to the 2019 coronavirus pandemic (COVID-19).

² For more information on NCSES's ongoing SOGI research efforts, see https://ncses.nsf.gov/about/faqs#card733.

sample more comparable to the Bridge Panel, we removed certainty cases from this analysis when making comparisons.³ Table 15 in Appendix A provides demographic characteristics for the full Bridge Panel sample alongside demographic characteristics for all eligible respondents to the Bridge Panel survey. Further, other than the last research question regarding completion mode, this analysis will be comparing new cohort web responses to Bridge Panel web responses since the Bridge Panel only provided the web mode option.

2.1 Research Questions

We sought to answer the following research questions to determine the effects of question changes and additions.

2.1.1 Grid research questions

- 1. Does changing the grid format to an item-by-item format affect response or respondents' interactions with the web survey instrument?
- 2. Does the effect from research question 2.1.1.1 vary by the number of response options in the grid or item-by-item list?

2.1.2 SOGI research questions

1. Do respondents appear to have issues understanding or responding to the new sex, gender, and sexual orientation questions relative to the production sex question and questions of similar length and number of response options?

2.1.3 Coronavirus pandemic research questions

- 1. Does including questions about the coronavirus pandemic's effect on salary and income influence the final reported amount?
- 2. Is there a change in the response distributions when the pandemic response options are added to grid or item-by-item questions?
- 3. Looking at just the questions on the production instrument, are questions that refer to the coronavirus pandemic reported differently across CATI, paper, and web modes?⁴

2.2 Data Analysis

All estimates were weighted to measure differences. We used base weights for the paradata analysis and final weights for the survey estimates. Alternate new cohort weights, created by

³ Weights were adjusted to account for removing certainty cases.

⁴ This research question examined NSCG questions which referred to the pandemic across response modes, and it does not compare 2021 new cohort production to the 2021 Bridge Panel. Instead, it looks at both old and new cohort respondents, not Bridge Panel respondents. This research question is included in this analysis and report because it pertains to the coronavirus pandemic questions that are also examined during this report.

removing certainty cases, are used to compare production to the Bridge Panel. Equations for these estimates are found in Appendix B. Response distributions used edited and imputed data and final weights that account for nonresponse and other survey-specific weighting adjustments. We estimated variances using the successive difference replication method (Hall, Gilary, & Farber, 2021).

Completion times, changed answers, item nonresponse, mean salary and earnings estimates, and breakoff rates were compared, when appropriate, using t-tests of differences or a chisquare test of independence (alpha level of 0.10), between the NSCG production and Bridge Panel. Statistical differences in response distributions were identified using chi-square tests. Appendix C provides hypothesis test criteria for statistical tests performed in each research question section. The NSCG and Bridge Panel have a complex sample design, creating a large design effect which increases variance estimates. We expect that these design effects will create less opportunities for statistical significance in comparative tests, so we will note meaningful differences when warranted. For a full list of screenshots displaying the differences between the production and Bridge Panel questionnaires, see Appendix D.

We verified our findings using double programming, a verification process in which multiple staff develop program code independently to produce results. This practice helps ensure the quality of deliverables.⁵

For paradata measures, we included nonrespondents (those that logged into the web instrument but did not finish or ultimately completed the survey using another mode) and excluded ineligibles, and for survey estimates we excluded nonrespondents and ineligibles.

3. Assumptions and Limitations

- Our experience has shown that paradata files are often messy (records out of order, incongruous time frames, missing observations). Data issues were dealt with on a case-by-case basis. There were no major record issues identified that impeded analysis.
- There are not corresponding questions on the production instrument to compare to the sexual orientation and gender identity questions on the Bridge Panel. We attempted to find meaningful comparisons to these questions. See Section 4.2 in the results for more information.
- Several grid-formatted questions intended to be analyzed with the Bridge Panel were confounded by two experimental treatments; grid questions that also contained pandemic-related response options. If there is a significant difference in response behavior and estimates when switching between grid to item-by-item formats, we will not be able to parse out the additional effect of the pandemic-related response options for these specific questions. See Section 4.3 in the results for more information.

⁵ For disclosure purposes, the code used for programming and verifying results will be saved on the M drive under the DSMD Survey Methodology area folder.

4. 2021 NSCG Bridge Panel Analysis Results

This section provides details specific for each analytical topic (i.e., grid, SOGI, and coronavirus pandemic-related questions) and its results.

4.1 Grid versus item-by-item analysis

Question and item wording and response options were the same for the 12 grid and item-byitem formatted questions we analyzed on both the production and Bridge Panel surveys.⁶ However, the format of the questions differed. The production instrument displayed items in a grid with yes and no or scale responses horizontally while the Bridge Panel displayed items as individual questions with the yes and no or scale responses displayed vertically (shown in Figure 1). There are 12 questions in this analysis that contain 88 items total.

For the production instrument, if a respondent's browser width was less than 992-pixel resolution, which includes most smartphones, the grid was no longer displayed and was instead shown in the item-by-item format. For this reason, we limited our analysis of the grid questions to production respondents who logged in using browsers with a width of 992-pixels or greater resolution. This ensured that we only compared estimates between the grid to item-by-item displays.

Figure 1: Example questions formatted as grid versus item-by-item display (screenshots) Production (grid) Bridge Panel (item-by-item)

rioduction (grid)			bridge i allei (itelli-by-itelli)	
Did your duties on this job require the technical expertise of a bachelor's degree or higher in Select Yes or No for each Item.			Did your duties on this job require the technical expertise of a bachelor's degree or higher in Select Yes or No for each Item.	
Yes No		No	1. Engineering, computer science, math, or the natural sciences Ves No	
Engineering, computer science, math, or the natural sciences	0	0	2. The social sciences	
The social sciences	0	0	0 No	
Some other field (e.g., health, business, or education), <i>specify</i>	0	0	3. Some other field (e.g., health, business, or education), <i>specify</i> Ves No	
< Previous Next >			✓ Previous Next >	

Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, MGINTRO

⁶ Some grid and item-by-item formatted questions also included pandemic-related response options that were not included in the Bridge Panel. Those are removed from this part of the analysis. We discuss the coronavirus pandemic-related questions more in Section 4.3.

4.1.1 Grid versus item-by-item analysis results

Research Question 2.1.1.1: Does changing the grid format to an item-by-item format affect response or respondents' interactions with the web survey instrument?

Item nonresponse rates

To answer whether item format affected responses or respondents' interactions with the instrument, we calculated item nonresponse rates, response estimates, breakoff and changed answer rates, and completion times.

Figure 2 displays a summary of the item nonresponse rates for the 88 items in this analysis. The chart shows a side-by-side comparison of each item and its item missingness for both the grid and item-by-item format. For example, the first blue and green lines show that for the first item, the grid format had 13.5 percent item nonresponse and the item-by-item had 5.7 percent. The full table of item nonresponse estimates by item can be found in Table 19 in Appendix E.



Figure 2: Item nonresponse rates for grid and item-by-item formatted questions

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

The grid format usually had a higher item nonresponse rate compared to the corresponding item-by-item format; 72.7 percent of the 88 items tested showed significantly higher item nonresponse rates in the grid format. This was not surprising since previous research shows that some respondents do not attend to the "No" column when presented with the grid format. Specifically, Horwitz and her colleagues (2020) conducted a mouse tracking study and found that many respondents did not track their mouse over the "No" column at all. Two separate studies of college students found that one percent (Smyth, Christian, & Dillman, 2008) and 2.7 percent (Smyth, Dillman, Christian, & Stern, 2006) treated the grid as a check-all-that apply question and did not attend to the "No" column. Another study from Callegaro and colleagues (2015) found higher rates of respondents not using the "No" column (16.9 percent in one study and 3.2 percent in another). In the NSCG, many of these missing items are edited or imputed to a "No" selection. Of the two rating scale questions in this analysis, neither showed large item nonresponse for the grid or item-by-item formats.

Table 1 provides an example of item nonresponse rates for three of the 88 items in this analysis (i.e., one of the 12 questions): the question about job duties requiring technical expertise of a bachelor's degree or higher. We see that 13.5 percent of respondents using the grid format left the first response option missing, while only 5.7 percent of those with the item-by-item format left the equivalent question missing. Similar patterns were observed for the other 11 questions, provided in Appendix E.

Did your duties on the job require the	Item Nonresponse (Standard Error)				
technical expertise of a bachelor's degree or higher in	Grid (Production)	Item-by-item (Bridge panel)	Chi-square p-value		
Engineering, computer science, math, or the natural sciences	13.5 (0.5)	5.7 (0.8)	*<.0001		
The social sciences	17.1 (0.5)	9.1 (0.9)	*<.0001		
Some other field (e.g., health, business, or education), specify:	9.0 (0.3)	9.2 (1.0)	0.7988		

Table 1: Item nonresponse rates for NSCG question about job duties requiring technical expertise of a bachelor's degree or higher

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment, NSCG question MGINTRO *Denotes statistical significance with Rao-Scott Chi-square test at 0.10 alpha

Note: Rao-Scott Chi-square test compared item nonresponse distributions between grid and item-by-item

Response distributions

It is generally important to avoid item nonresponse for better quality data. However, the item nonresponse rates were relatively low for rating scale questions in both formats, and research suggests that at least some of the item nonresponse in the grid format can be attributed to respondents not using the "No" column but still providing affirmative responses. Therefore, we also examined the final distributions of the edited and imputed data.

Figure 3 and Figure 4 provide a summary of the "Yes" and total positive rating scale responses for the grid and item-by-item formats, respectively. This summary shows that overall, the

estimates were similar, with the item-by-item format generally seeing more "Yes" responses for Yes/No questions and more positive responses for rating scale questions than grid. Approximately 19.3 percent of the 88 items had significantly different estimates between the grid and item-by-item. See Table 21 in Appendix F for a full list of the response distributions.



Figure 3: Percent "Yes" responses for grid and item-by-item Yes/No questions

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment



Figure 4: Percent positive responses for grid and item-by-item rating scale questions

As an example, Table 2 provides the percent of "Yes" responses for the NSCG question about job duties requiring technical expertise of a bachelor's degree or higher. We can see that even though the production grid-format had more item nonresponse, there is no statistical difference in the percent of "Yes" responses. See Appendix F for response distributions for all the items in this analysis.

bachelor's degree or higher		1
	Porcent "Vos" Posnonso]

Did your duties on the iob require	Percent "Yes" Response (Standard Error)			
the technical expertise of a bachelor's degree or higher in	Grid (Production)	Item-by-item (Bridge panel)	Chi-square p-value	
Engineering, computer science, math, or the natural sciences	32.2 (0.7)	32.6 (1.5)	0.7774	
The social sciences	18.1 (0.5)	19.1 (1.5)	0.5459	
Some other field (e.g., health, business, or education), specify:	46.5 (0.7)	47.0 (1.9)	0.8108	

Source: Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment, NSCG question MGINTRO

*Denotes statistical significance with Rao-Scott Chi-square test at 0.10 alpha

Note: Rao-Scott Chi-square test compared response distributions between grid and item-by-item

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Our findings that the item-by-item format usually had more affirmative answers are consistent with prior research comparing a check-all-that-apply format to a Yes/No grid format. However, there is disagreement among researchers as to whether more is better. Several researchers believe that forced-choice answers demand more thought than check-all-that (Sudman & Bradburn, 1982). Many scholars believe that forced-choice answers elicit deeper cognitive processing (Bradburn, Sudman, & Wansink, 2004). The theory of deeper cognitive processing argues that the Yes/No forces respondents to consider each item singularly and possibly reduces satisficing strategies (Krosnick J., 1999; Smyth, Dillman, Christian, & Stern, 2006; Thomas & Klein, 2006; Nicolaas, Campanelli, Hope, Jackle, & Lynn, 2011)

On the other hand, some researchers believe these findings could also be explained by acquiescence response bias, which is "the tendency for survey respondents to agree with statements regardless of their content" (Holbrook, 2008). While most research on acquiescence bias focused on Agree/Disagree questions, it was extended to Yes/No questions by Krosnick and Presser (2010). Callegaro and colleagues (2015) conducted a meta-analysis to compare the two formats and identify which theory, deeper cognitive processing or acquiescence bias was more accurate for the forced-choice and check-all-that-apply debate but were unable to draw a clear conclusion. This leaves ambiguity regarding how more affirmative responses should be interpreted and what it means for data quality.

We believe that the findings from studies focused on check-all versus a Yes/No format can be extended to this grid and item-by-item experiment. In this case, the grid requires less cognitive burden than the item-by-item, as all the grid questions are placed together, and the respondent can view them all at once. Item-by-item, on the other hand, presents each item as an individual question, which could lead to more focus on each item rather than scanning through a list in a grid.

While we feel the deeper cognitive processing theory is more compelling, the acquiescence theory cannot be ignored, especially given that we tended to see more positive responses for the rating scale questions in the item-by-item format. Therefore, we balance the findings from the response distributions with additional analyses presented below to reach a recommendation in the conclusion section.

Breakoff rates

A concern when changing question format is whether the change will prompt more breakoffs from the survey. More breakoffs would lead to less information collected in the questions following the newly formatted question and potentially fewer sample respondents eligible for future cycles. The summary in Figure 5 shows that the item-by-item format generally had a higher breakoff rate than the grid format. The screens in Figure 5 are presented in the order in which they appear in the web instrument. Significant differences occurred on MGINTRO (technical expertise required for principal job), SATINTRO (satisfaction with aspects of job), and WTRINTRO (reasons for work-related training). See Table 31 in Appendix G for full results and question text.

Overall, the breakoff rate was higher with the item-by-item format by approximately 5.8 percentage points (12.8 percent (se = 1.4) breakoff rate for production, 18.6 percent (se = 4.1) for Bridge Panel). While this difference was not statistically significant, the difference was large enough that we think it is notable.

Figure 5: Breakoffs by screen as a percent of respondent visits for grid and item-by-item formatted questions



Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment *Denotes statistical significance at alpha 0.10

Changed answers

Next, we examined the percent of changed answers on the 12 questions for the grid and itemby-item formats. Changed answer estimates can be an indication that the question or question formatting was burdensome or difficult for respondents. Figure 6 provides a summary of the changed answers as a percent of respondent visits to the screen for the grid and item-by-item questions. We can see that the item-by-item format tends to have more changed answers than the grid format. However, given that respondents tend to leave grid questions blank as a proxy for a "No" response, we would expect fewer changed answers for the Yes/No grid questions, since respondents "changing" their blank response to "Yes" wouldn't be captured in the estimate.



Figure 6: Changed answers as a percent of respondent visits for grid and item-by-item questions

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment *Denotes statistical significance with Rao-Scott Chi-square test at 0.10 alpha

Continuing to look at the NSCG question asking about duties on the job that required the technical expertise of a bachelor's degree or higher, we see in Table 3 that of respondents who viewed this question, 16.3 percent had changed an answer on the grid format and 18.7 percent changed an answer on the item-by-item format. The difference between the percent of changed answers is 2.4 percentage points and is statistically significant. Additional results and question text can be found in Table 32 in Appendix G.

Table 3: Changed answers for NSCG question about job duties requiring technical expertise of a bachelor's degree or higher

Changed Answers: Percent of Respondent Visits by Question (Standard Error)						
Did your duties on the job require the	Grid (Production)	Item-by-item (Bridge panel)	Chi-square p-value			
technical expertise						
of a bachelor's						
degree or higher in	16.3% (0.5)	18.7% (1.4)	*0.0751			

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment, NSCG question MGINTRO *Denotes statistical significance with Rao-Scott Chi-square test at 0.10 alpha

Note: Rao-Scott Chi-square test compared the rate of changed answers between grid and item-by-item

Completion time

Lastly, we looked at the median time it took to complete the grid and the item-by-item questions. Figure 7 shows that the completion times were similar across the 12 questions. Only three of the 11 questions⁷ had a significantly longer median completion time for the item-by-item format, ranging from a difference of 2.3 seconds to 3.7 seconds. Contrary to other studies (Revilla, Toninelli, & Ochoa, 2015), we see that the grid format had similar median completion times to the item-by-item format. See Table 34 in Appendix G for numeric results.

⁷ We did not calculate completion times for NRINTRO (reasons for working outside the field of your highest degree) because most respondents who visited the screen that contained NRINTRO did not receive this follow-up question. Only respondents who selected "Not related" to the question, "To what extent was your work on your principal job related to your highest degree?" saw NRINTRO appear on the same screen after their selection.



Figure 7: Completion times for grid and item-by-item screens

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment *Denotes statistical significance at alpha 0.10

Research Question 2.1.1.2: Does the effect from research question 2.1.1.1 vary by the number of response options in the grid or item-by-item list?

Similar patterns were identified across all 12 questions in this analysis, regardless of the number of response options for that question.

4.1.2 Grid analysis summary

The analysis of the grid and item-by-item formats showed that the item-by-item format had higher breakoff rates, more changed answers, and slightly longer completion times than the grid format. However, it also showed that the item-by-item format had less item nonresponse and more "Yes" and positive responses than the grid format.

4.2 SOGI research analysis

New questions about sex, gender, and sexual orientation were tested on the 2021 Bridge Panel to more accurately reflect how respondents identify themselves. In the 2021 NSCG production questionnaire, there is only one question on SOGI topic - the sex question, which reads, "What

is your sex?" Alternatively, the Bridge Panel asks about the sex assigned at birth and the current gender identity (see Figure 8) as well as a question asking about sexual orientation (

Figure 9).

Figure	8:	Questions	about se	x and	gender	(screenshots)
	•••				00.00.00	(

Production	Bridge Panel		
Sex	Birth Sex		
What is your sex? <u>Help</u> Male Female 	What sex were you assigned at birth, on your original birth certificate? Male Female Don't know 		
<pre></pre>	<pre></pre>		
	Current Gender		
	What is your current gender identity?		
	Select all that apply.		
	Male Formula		
	Gender non-conforming Non-binary		
	Genderfluid		
	Other gender identity, specify		
	Prefer not to answer		
	< Previous Next >		

Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, GENDER, BIRTH_GENDER, NOW_GENDER

Figure 9: Question about sexual orientation (screenshot)

Production	Bridge Panel	
	Sexual Orientation	
	Regardless of your sexual experience, what is your sexual identity or orientation?	
	Select all that apply.	
	Lesbian or gay Straight, that is, not gay Bisexual Asexual Pansexual Fluid Queer Other sexual orientation, <i>specify</i>	
	Prefer not to answer	
Not on production	< Previous Next >	

Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, ORIENTATION

We calculated item nonresponse rates, response estimates, breakoff, changed answer and previous click rates, and completion times to examine the effect of these new questions.

Statistical comparisons across instruments were only made between the sex questions, Sex and Birth Sex, for most measures. Comparisons between Sex and Current Gender or Sexual Orientation were not appropriate in most cases as the topic, length, order, and type of question (select one vs. select all) were different. Additionally, if the intent is to have three questions in place of one, it's expected that item nonresponse, breakoffs, changed answers, previous clicks, and completion times will all be greater for three questions compared to one question.

4.2.1 SOGI research results

In this section, we provide results for the SOGI analysis.

Research Question 2.1.2.1: Do respondents appear to have issues understanding or responding to the new sex, gender, and sexual orientation questions relative to the production sex question and questions of similar length and number of response options?

Item nonresponse rates

We started by calculating item nonresponse rates, displayed in Table 4. Item nonresponse rates for Sex (0.5 percent) and Birth Sex (0.4 percent) were not significantly different. Of the SOGI questions, the sexual orientation question had the highest item nonresponse rate at 2.1 percent. For comparison, we calculated item nonresponse rates for two other sensitive questions in the NSCG survey: Salary and Earn, displayed in Table 5. This offers more insight into the magnitude of the SOGI item nonresponse rates. The SOGI item nonresponse (between 0.5 and 2.1 percent) was lower than salary and earned income item nonresponse (between 5.1 and 7.2 percent).

Production	Bridge Panel				
Sex	Birth Sex	Current Gender	Sexual Orientation		
0.5% (0.1)	0.4% (0.2)	0.6% (0.2)	2.1% (0.5)		

Table 4: Item nonresponse rates: SOGI (standard errors)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment Note: Statistical comparison between Sex and Birth Sex was not significant at alpha 0.10 (p-value 0.5051)

Table 5: Item nonresponse rates: salary and earn (standard errors)

Salary		Earn	
Production	Bridge Panel	Production	Bridge Panel
5.1% (0.3)	5.5% (0.8)	7.0% (0.4)	7.2% (0.8)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Response distributions

Next, we calculated the response distributions and found they were not significantly different between the production and bridge panel sex questions when removing the "Don't know" responses from Birth Sex (which was less than 0.1 percent of respondents), displayed in Figure 10. The difference in the percentage of male and female respondents between the two

questions is 0.2 percentage points. This finding suggests that asking, "What is your sex?" in the production instrument is similar to asking "What sex were you assigned at birth, on your original birth certificate?" in the Bridge Panel instrument.



Figure 10: Production and Bridge Panel distribution of sex

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment Note: Removed "Don't know" responses from Birth Sex (less than 0.1 percent of respondents answered "Don't know")

We summarized responses from the Birth Sex and Current Gender questions to create four categories: male, female, minority, and prefer not to answer. If responses to Birth Sex and Current Gender matched, they were added to their respective gender category, male or female. If the respondent did not provide any information and only selected "Prefer not to answer" for Current Gender, then we categorized the case as prefer not to answer. All other combinations of responses were categorized as a gender minority.⁸ Gender minorities accounted for only 1.0 percent of Bridge Panel respondents. The full distribution of gender minorities responses is in Figure 11.

⁸ There were less than 0.5 percent of respondents who selected "Other" with a write-in to Current Gender. The write-ins were mostly hostile, with responses that referred to religion, science, or feeling the question is inappropriate to ask. If we were able to conclude their gender from their Birth Sex and their write-in to Current Gender, we added them to male or female accordingly. If we were unable to deduce their gender from their Birth Sex and Current Gender write-in response, they were removed from analysis. All of the hostile write-in responses to Current Gender had sampling frame data depicting male sex.



Figure 11: Gender minorities in the Bridge Panel

We noticed that the Bridge Panel had 53.9 percent female respondents for Birth Sex and 53.1 percent female who matched their Birth Sex response to Current Gender (difference of 0.8 percentage points). There were 46.1 percent male respondents for Birth Sex and 44.6 percent male when matched to Current Gender (difference of 1.5 percentage points). The majority of respondents (83.8 percent) who preferred not to answer the Current Gender question reported their Birth Sex as male.

Similar to gender minorities, we summarized responses from the Bridge Panel sexual orientation question to create three categories: straight, minority, and prefer not to answer.⁹

Figure 12 provides the distribution of sexual orientation responses. Approximately six percent of respondents were considered sexual orientation minorities and 7.4 percent selected "Prefer not to answer" to this question.

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

⁹ There were less than 0.5 percent of respondents who selected "Other" to Sexual Orientation and who wrote in a response. The write-ins were mostly hostile with most responses questioning the relevance to the survey topic. If we were unable to deduce and categorize sexual orientation from the write-in response, then it was removed from analysis.



Figure 12: Sexual orientation minorities in the Bridge Panel

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

We can compare these results to the National Academies of Science findings for sexual orientation identity item nonresponse (Measuring Sex, Gender Identity, and Sexual Orientation, 2022). Page 80 of the report shows results from five national surveys: 2016 National Crime Victimization Survey (NCVS), 2018 General Social Survey (GSS), 2020 Behavioral Risk Factor Surveillance System (BRFSS), 2020 National Health Interview Survey (NHIS), and 2021 Census Pulse Survey. None of the questions these surveys use to collect information about sexual orientation provided a "Prefer not to answer" response option. Rather, all provided an option similar to "I don't know." The item nonresponse and unknown rates ranged from 1.9 to 2.8 percent. Compared to these other national surveys, we believe that 7.4 percent reported for "Prefer not to answer" is high.

Cross-distributions of the SOGI items with eight demographic characteristics (found in Appendix H)¹⁰ showed several significant differences in respondent makeup within Sex (production) and Birth Sex (Bridge Panel). In Table 6, we see that all demographic characteristics analyzed are significantly different between males and females for the Sex question on the production instrument. The Bridge Panel Birth Sex question also shows several significant differences between males and females. Sexual orientation and gender minorities showed significant differences for age group and marital status. Gender minorities also showed significant differences for their highest educational degree.

¹⁰ Cross-tabulations of gender minority by demographic characteristics were evaluated as part of this analysis. However, the cell sizes in the cross-tabulations create disclosure risk and are not included in this report.

	Production		Bridge Panel	
Characteristic	Sex (Male/Female)	Birth Sex (Male/Female)	Gender Minority (Yes/No)	Sexual Orientation Minority (Yes/No)
Respondents (n)	25,000	2,600 ⁺	2,600^	2,400^
Age Group	*	*	*	*
Citizenship	*			
Highest Degree	*	*	*	
Hispanic Origin	*	*		
Race	*	*		
Science & Engineering Degree	*	*		
Science & Engineering				
Occupation	*	*		
Marital Status	*		*	*

Table 6: Significant differences in response distributions across demographic characteristics

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment *Indicates significant difference with alpha 0.10

^Removed "Prefer not to answer" responses for this analysis.

[†]Removed "Don't know" responses from Birth Sex for this analysis (less than 0.1 percent of respondents answered "Don't know").

Note: Demographic characteristics are captured using responses to the American Community Survey. Highest degree, race, and marital status categories were collapsed to prevent small cell sizes.

The highest percent of sexual orientation minorities and gender minorities were concentrated in the youngest age group (29 or younger), while the opposite was true for non-minorities. The highest percent of non-minorities was in the oldest age group, the 60-75 age range.

Another significant difference for sexual orientation and gender minorities was marital status.¹¹ Sexual orientation and gender minorities were less likely to be married. We saw a smaller percent in the married categories for minorities than we do for the non-minorities. One other significant difference for gender minorities was their highest educational degree. Gender minorities have more bachelor's or professional degrees, and fewer master's or doctorate degrees, than non-minorities.

Breakoff rates

Next, we examine breakoff rates for the SOGI question series. We compared the production sex question to the Bridge Panel SOGI section to measure the expected impact on breakoffs from switching from one question about sex to three questions about birth sex, current gender, and sexual orientation, which are presented on individual screens. The only SOGI question with breakoffs on the Bridge Panel was Sexual Orientation. Two percent of all breakoffs from the Bridge Panel occurred on the Sexual Orientation screen, which was significantly higher than the

¹¹ Marital status measured whether the respondent was married or not married (i.e., widowed, divorced, separated, or never married) at the time of their completion of the American Community Survey.

production Sex question (0.1 percent; p-value <0.0001). For reference, the full 2021 new cohort paradata results showed that the 11th highest breakoff screen had 1.9 percent of all breakoffs.¹² There are screens in the instrument that fewer respondents visit; therefore, we also calculate breakoff rates as a percent of the number of respondents that visit a screen. Sexual Orientation had 0.2 percent of all respondents who saw the screen breakoff on that screen, while the screen with the Sex question had less than 0.1 percent of respondents breakoff (Table 8). While the difference in breakoff rates between the production and Bridge Panel instruments is notable, Sexual Orientation is fortunately near the end of the survey and limited data would be lost in the current cycle with a breakoff on this screen; however, breakoffs would not be eligible for future cycles unless they completed by some other mode.

Production	Bridge Panel			
Sex	Birth Sex	Current Gender	Sexual Orientation	
0.1% (0.1)	0.0% (N/A)	0.0% (N/A)	2.0% (1.6)	

Table 7: Percent of all breakoffs (standard errors)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Table of Breaken	races as a percer	ie of respondence the		
Production	Bridge Panel			
Sex	Birth Sex	Current Gender	Sexual	
			Orientation	
<0.1% (<0.1)	0.0% (N/A)	0.0% (N/A)	0.2% (0.2)	

Table 8: Breakoff rates as a percent of respondent visits (standard errors)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Changed answers

The percent of respondents who changed their answer was relatively low for the sex question on the production instrument and all three SOGI questions. The rates displayed in Table 9 for Sex and Birth Sex were not significantly different (p-value 0.9186). The lower changed answer rate for Sex and Birth Sex tells us that respondents were familiar with response options and/or they did not have difficulty finding a response option that fit their needs. The slightly higher changed answer rates for Current Gender and Sexual Orientation compared to Sex and Birth Sex indicate that respondents might have thought they found a response that fit them, but as they read the longer list of response options, found a response that better fit their identity.

¹² For comparison, the screens in the 2021 NSCG production new cohort instrument with the highest breakoff rates were as follows: EMINFO (principal employer information) – 10.3% (1.1), OCPRV (description of principal job) – 6.4% (1.1), VERIFYDOB (date of birth) – 4.2% (0.7), EARN (total earned income write-in) – 4.1% (0.8), WAINTRO (work activities) – 4.0% (0.7), CERT_LICENSE_ONE (most recent certification or license) – 3.1% (0.6), CONTACT (contact information) – 2.9% (0.6), MRD (most recent degree information) – 2.8% (0.4), WRKG (working status) – 2.8% (0.8), VERIFYNAME (confirm name) – 2.6% (0.5), and VERIFYACS (County and state of residence on ACS) – 1.9% (0.6) (Heimel, Reeves, & Varela, Forthcoming).

Production	Bridge Panel			
Sex	Birth Sex	Current	Sexual	
		Gender	Orientation	
1.0% (0.1)	1.0% (0.3)	2.5% (0.5)	3.4% (0.6)	

Table 9: Percent of respondent visits with a changed answer (standard errors)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Previous clicks

The percent of respondent visits with a previous click on these questions was also low for Sex and Birth Sex, displayed in Table 10. The rates for Sex and Birth Sex were not significantly different (p-value 0.6283). Similar to the changed answer rates, we notice that Current Gender and Sexual Orientation had higher previous click rates than Sex and Birth Sex. We attribute this to the newness of these questions. The previous clicks on these pages may be because respondents did not fully read the question before it and are confused why sex or sexual orientation are asked again. In cognitive interviews for a national survey of children's health, our team discovered that there is still confusion in the general population between gender identity and sexual orientation (Bottini, Newman Satisky, & Sloan, 2021). Misunderstanding gender identity and sexual orientation as the same might lead respondents to click previous to identify the differences between these questions.

Production	Bridge Panel		
Sex	Birth Sex	Current	Sexual
		Gender	Orientation
0.8% (0.1)	0.7% (0.3)	2.5% (0.5)	2.0% (0.4)

Table 10: Percent of respondent visits with a previous click (standard errors)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Completion time

The question stem for the production question Sex contains four words, and the question stem for the Bridge Panel question Birth Sex contains 12 words. Most people can read at an average rate of about four words per second, or 250 words per minute (Rayner, Slattery, & Belanger, 2010). Therefore, we would expect that it would take one second to read the Sex question, and Birth Sex would take three seconds, a two second difference. As expected, it took respondents significantly longer (1.7 seconds) to complete Birth Sex than Sex (p-value <0.0001), displayed in Table 11.

Table 11: Median com	pletion times in seconds	(standard errors)
	ipiction times in seconds	(Standard Criois)

Production	Bridge Panel			
Sex	Birth Sex	Current	Sexual Orientation	Mother or Female
		Genuer	Onentation	Guardian Euucation
2.6 (<0.0)	4.3 (0.1)	4.7 (0.1)	10.1 (0.3)	9.5 (0.2)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment Note: Sex (production) and Birth Sex (Bride Panel) are significantly different at alpha=0.1

To provide context to the completion time for Sexual Orientation, we calculated the completion time for an NSCG question about the mother's or female guardian's education level (EDMOM). A screenshot of EDMOM is provided in Figure 13. We selected EDMOM to compare to the Sexual Orientation completion time because it is similar in length and has a similar number of response options (8) as Sexual Orientation (9). Sexual Orientation took 0.6 seconds longer to complete than EDMOM. Considering Sexual Orientation has one more response option and some of the response options may be new for the general population to read, a median completion time of 10.1 seconds seemed reasonable and did not indicate respondent difficulties when responding.

Figure 13: NSCG question about mother or female guardian education (screenshot)



Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, EDMOM

4.2.2 SOGI research summary

Item nonresponse, response estimates, changed answer rates, and previous click rates were not statistically different between Sex on the production instrument and Birth Sex on the bridge panel. We can conclude that respondents understood the items to mean the same thing.

Breakoff rates on SOGI questions were significantly different between production and the Bridge Panel. The breakoff rate on the production instrument with one question, Sex, was 0.1 percent, while the breakoff rate for the Bridge Panel with three questions was 2.0 percent. Sexual Orientation was the only question with breakoffs in the SOGI series.

Changed answer rates, previous click rates, and median completion times were slightly higher for Current Gender and Sexual Orientation than Sex and Birth Sex, which was expected since they contain more response options, and response options with terms respondents may not be familiar with yet.

4.3 Coronavirus pandemic question analysis

In the 2021 NSCG, questions and response options related to the coronavirus pandemic were added to the production questionnaire. These items were not included on the Bridge Panel to

provide a controlled comparison to the production survey. For example, the production questionnaire asked follow-up questions to the Salary question:

"For the principal job you held during the week of February 1, 2021, has your basic annual salary been affected at any time by the coronavirus pandemic?" and

"How has your basic annual salary been affected by the coronavirus pandemic?"

In contrast, the Bridge Panel did not ask these coronavirus pandemic follow-up questions and only asked Salary, displayed in Figure 14.

Figure 14: Salary question on both production and Bridge Panel questionnaires (screenshot)

As of the week of February 1, 2021, what was your <u>basic annual salary</u> on your principal job, before deductions?
Do not include bonuses, overtime, or additional compensation for summertime teaching or research.
If you are not salaried, please estimate your earned income, excluding business expenses.
Annual salary or earned income \$00
< Previous Next >

Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, SALARY

Figure 15 provides an example of a coronavirus pandemic-related survey item on the production questionnaire but not on the Bridge Panel.

Figure 15: Example question related to the coronavirus pandemic (screenshot)



Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, SALCOV2

4.3.1 Coronavirus pandemic questions results

This section provides results for the comparison of questions with references to the coronavirus pandemic between the production and Bridge Panel surveys. It also contains results for questions with coronavirus pandemic-related response options only in NSCG production for all three modes: CATI, web, and paper.

Research Question 2.1.3.1: Does including questions about the coronavirus pandemic's effect on salary and income influence the final reported amount?

The 2021 NSCG production instrument included questions about whether salary or earned income were affected by the coronavirus pandemic. We start by comparing the salary and earned income questions between the two surveys to determine whether adding coronavirus pandemic follow-up questions in the production instrument affected reported income. Table 12 displays the mean and median of the salary and earned income questions for the production and Bridge Panel surveys. The Bridge Panel had nominally lower mean and median for salary, and nominally higher mean but lower median for earned income. Mean salary and earned income were not significantly different between the two surveys.

Survey Item	Estimate	Production	Bridge Panel	p-value
Colomi	Mean	92,860 (1,348)	89,390 (2,008)	0.1619
Salary	Median	72,920 (1,305)	70,000 (2,007)	
Earned	Mean	98,750 (2,295)	101,000 (8,602)	0.8011
Income	Median	69,990 (863.90)	67,740 (1,861)	

Table 12: Mean and median estimates for 2021 NSCG production and Bridge Panel surveys (standard errors)

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment Note: T-test compared means between production and Bridge Panel

Because different occupations may have been impacted by the pandemic in different ways, we also examined the difference in reported salary and earned income by broad occupation type of the principal job held. Table 13 displays the mean earned income and the differences between surveys. There are ten categories with a significantly different mean income between the two surveys (in bold). Seven of the ten categories with significant differences have a higher mean income reported for the production instrument. We found similar results by broad category for mean salary. See Appendix I for mean salary and standard errors for earned income.

Even though the overall mean income and salary are not different between surveys, it is possible that the reported salary and earned incomes for certain job categories were affected by discussing the pandemic throughout the survey. Additionally, respondents may have seen the salary follow-up questions regarding the effect of the pandemic on their salary and

backtracked to change their salary to its pre-pandemic value. Without further analysis, not in scope for this project, it's difficult to determine the true reason for the differences.

Broad Occupation			Difference in	
Category	Production	Bridge Panel	Mean Estimates	p-value
Biological/Life Scientists	86,460	89,340	(2,881)	0.8793
Clerical/Administrative Support				
Occupations	43,820	43,290	526.60	0.9139
Clergy/Other Religious Workers	55,210	47,400	7,806	0.2699
Computer Occupations	112,400	114,400	(2,059)	0.7728
Counselors	50,940	50,870	72.95	0.9952
Engineers/Architects	129,800	114,900	14,920	*0.0898
Engineering Technologists/				
Technicians/Surveyors	96,490	76,260	20,230	*0.0415
Farmers/Foresters/				
Fishermen	46,190	87,500	(41,300)	*0.0002
Health Occupations	100,400	127,000	(26,590)	*0.0348
Lawyers/Judges	249,000	187,500	61,510	0.3966
Librarians/Archivists/				
Curators	51,440	28,740	22,700	*0.0098
Managers, Top-level Executives/	250 200	402.200	75 000	*0.0000
Administrators	259,200	183,300	/5,890	*0.0060
Managers, Other	154,000	260,600	(106,600)	0.3433
Management-Related Occupations	109,500	112,200	(2,644)	0.7973
Mathematical Scientists	113,800	80,430	33,380	*0.0139
Physical Scientists	85,280	138,700	(53,390)	0.1456
Sales/Marketing Occupations	89,250	66,920	22,340	*0.0051
Service Occupations, Except Health	51,480	43,870	7,613	0.2204
Social Scientists	82,290	86,800	(4,510)	0.6794
Social Workers	53,230	50,500	2,723	0.6713
Teachers—Precollege	54,430	55,070	(645.70)	0.8580
Teachers/Professors—Postsecondary	80,510	81,910	(1,402)	0.8924
Teachers—Other	32,850	37,160	(4,301)	0.6481
Writers/Editors/Public Relations				
Specialists/Artists/				
Entertainers/Broadcasters	53,960	35,620	18,340	*0.0039
Other Professions	66,240	58,660	7,579	0.5064
Other Occupations	62,770	109,500	(46,700)	*0.0790
Respondents Not Working During the				
Reference Week	40,380	36,270	4,109	0.3741

Table 13: Mean earned income for 2021 NSCG production and Bridge Panel surveys

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment, EARN by N2OCPR-recoded to broad category

*Denotes statistical significance at alpha 0.10.

Note: T-test compared means between production and Bridge Panel

Research Question 2.1.3.2: Is there a change in the response distributions when the pandemic response options are added to grid or item-by-item questions?

Most questions were the same on both the production and Bridge Panel, but some of the production questions had additional response options related to the coronavirus pandemic. Figure 16 provides an example of these types of questions.

roduction (grid format)			Bridge Panel (item-by-item format
uring the week of February 1, 2021, what were your reasons for not working?			During the week of February 1, 2021, what were your reasons for not working?
	Yes	No	1. Retired O Yes
Retired	0	0	O No
		0	2. On tayoff from a job O Ves
On layoff from a job due to the coronavirus pandemic	0	0	O No
On layoff from a job for reasons unrelated to the coronavirus pandemic	0	0	3. Student O Yes
Student	0	0	O No 4. Family resoansibilities
Family responsibilities due to the coronavirus pandemic (e.g. childcare, eldercare)	0	0	O Yes O No
Family responsibilities unrelated to the coronavirus pandemic	0	0	5. Chronic illness or permanent disability
Chronic illness or permanent disability	0	0	O No
nite in the or permanent accurry	0	0	6. Suitable job not available
Suitable job not available	0	0	O Yes O No
Jid not need or want to work	0	0	7. Did not need or want to work
			O Yes
Other reason, specify	0	0	0.00
			8. Other reason, specify
			O No
< Previous Next >			
			(Predatis Next >

Figure 16: Example of confounded question, with coronavirus pandemic-related response options and grid format (screenshots)

Prior to analysis, we noted that this part of the research could be confounded if significant differences were found between the grid and item-by-item formats since all questions with additional pandemic-related response options were also formatted as grids. As we determined in Section 4.1, there were statistical differences in response distributions between the grid and item-by-item response format. Therefore, it is difficult to interpret differences in the questions with differing format in addition to differing response options; however, we still provide a summary of the response distributions for informational purposes. We note that of the 88 grid and item-by-item questions *without* coronavirus pandemic response options, 17 (about 19 percent) had a significantly different response distribution between surveys. Of the 44 grid and item-by-item questions *with* coronavirus pandemic response options, 11 (about 25 percent) had a significantly different response distribution between surveys. See Appendix F for the response distributions.

There was one question that was not a grid format, which contained slightly different wording around conference and meeting attendance in each survey (Figure 17). The percent of "Yes" responses on the production instrument for this question was 23.9 percent, and on Bridge Panel it was 20.3 percent. The difference of 3.6 percentage points is statistically significant (p-

Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, NWINTRO

value 0.0124). This suggests that including more detailed information in the response option influenced response.

Figure 17: Example of non-grid item with coronavirus pandemic-related response (screenshots)



Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021, PROMTGI

Research Question 2.1.3.3: Are questions that refer to the coronavirus pandemic reported differently across CATI, paper, and web modes?

We found that questions that referred to the pandemic had different response distributions depending on mode of completion (web, paper, or CATI). However, since respondents could choose their preferred mode to respond, we expect demographic differences by mode to contribute to the differences. Other research has shown that socio-demographic characteristics of respondents differ when they choose between different response modes (Datta, Walsh, & Terrell, 2002). Therefore, the differences we report are likely not solely due to a mode effect but also self-selection into preferred modes.

Table 14 provides new cohort response distributions for one of the 14 questions we examined. We see that the "Yes" responses vary depending on mode. For example, of paper respondents, 75.5 percent said they were retired, of CATI, 60.3 percent, and of web, 54.0 percent. This response distribution is one example of the underlying demographic differences among the different mode choices. It is possible retired respondents prefer paper and CATI modes and thus other differences observed in the other response options may be partially attributable to differences in the underlying sub-populations. See Appendix F for all pandemic-related questions' distributions by response mode.

		Percent "Yes" (Standard Errors)			
ltem	Response Options (Survey Item)	CATI	Paper	Web	Chi-square p-value
During the week of February 1, 2021, what	Retired	60.3 (4.0)	75.5 (2.8)	54.0 (1.1)	*<.0001
	On layoff from a job due to the coronavirus pandemic	15.8 (3.0)	4.2 (1.3)	10.0 (0.7)	*0.0008
	On layoff from a job for reasons unrelated to the coronavirus pandemic	10.4 (2.6)	2.4 (1.0)	3.4 (0.4)	*<.0001

Table 14: NSCG new cohort, reasons for not working question "Yes" responses by completion mode
		Pe	rcent "Yes"	(Standard Er	rors)
Itom	Response Ontions (Survey Item)	CATI	Paper	Web	Chi-square
were vour	Student	7 5 (2 0)	3 1 (1 1)	5 5 (0 5)	0 1265
reasons for not working?	Family responsibilities due to the coronavirus pandemic (e.g., childcare,	10 7 (2 3)	2 2 (1 0)	6.6 (0.7)	*0.0031
(NWINTRO)	Family responsibilities unrelated to the coronavirus pandemic	13.3 (2.7)	9.6 (1.9)	12.8 (0.9)	0.3613
	Chronic illness or permanent disability	18.8 (3.0)	9.7 (1.9)	6.3 (0.5)	*<.0001
	Suitable job not available	17.9 (3.3)	7.5 (1.7)	11.3 (0.8)	*0.0096
	Did not need or want to work	39.3 (3.5)	21.7 (3.4)	18.0 (0.9)	*<.0001
	Other reason, specify	4.8 (1.5)	3.1 (1.4)	6.7 (0.6)	0.1241

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment *Denotes statistical significance at alpha 0.10.

Note: Rao-Scott Chi-square test compared response distributions across modes

4.3.2 Coronavirus pandemic question summary

There were not significant differences in overall reported salary or income, but there may be a systematic pattern of over- or under-reporting salary of income by broad occupational category between the two surveys. Questions that had a grid format with coronavirus pandemic-related response options were difficult to analyze because the grid format alone showed statistically different estimates from the item-by-item format.

There are differences in estimates by respondent mode of completion. However, this is to be expected since their underlying populations are different.

5. Conclusions and Recommendations

The Bridge Panel provided the opportunity to measure the impact of new content and response formats. The results from this analysis will help inform future cycles of the NSCG as well as other Census Bureau surveys.

Grid and item-by-item formats

The item-by-item format had higher breakoffs, more changed answers, and slightly longer completion times than the grid format. While the item-by-item format had lower item nonresponse and more "Yes" and positive responses, most of the response distributions were not significantly different from the grid format. These findings are consistent with a meta-analysis conducted by Callegaro and colleagues (2015) comparing forced-choice to check-all that apply. They found that across several studies forced-choice, similar to item-by-item, increased endorsement rates substantially, and found a slightly higher breakoff rate. Because there are two opposing theories why item-by-item may be collecting more affirming responses, acquiescence bias and deeper cognitive processing, we cannot conclude with certainty that it is the superior format. Given the information we have, we see breakoffs as more of a concern

than item nonresponse and therefore recommend continuing to use the grid format for screens greater than or equal to 992-pixels wide (which includes most smartphones), but also conducting additional research to gain a better understanding of the response distribution differences.

Sexual Orientation and Gender Identity

While the analysis of SOGI questions was challenging due to not having comparative questions on both surveys, we can confirm that the response distributions for Sex (production) and Birth Sex (Bridge Panel) did not exhibit significant differences. Additionally, breakoffs in the SOGI series were low overall, with respondents only breaking off on Sexual Orientation. Based on these findings, the NSCG could use Birth Sex and Current Gender moving forward in production without concern about data quality. However, given the breakoff rate and the percentage of respondents that selected "Prefer not to answer," we recommend more testing on Sexual Orientation in focus groups and cognitive interviewing to gain insight into respondents' understanding of and reactions to this question. To improve the user experience and avoid previous clicks for respondents, federal workings groups and other surveys have recommended having the sex and gender questions on the same screen (Federal Interagency Working Group on Improving Measurement of Sexual Orientation and Gender Identity in Federal Surveys (SOGI IWG), 2016; Office of Management and Budget; Reeves, Bottini, & Horwitz, 2022). We recommend an NSCG experiment putting Birth Sex and Current Gender together on the same screen to reduce the rate of previous clicks between screens. We also recommend removing the "Prefer not to answer" option from the question about Current Gender. A recent report released by the National Academies of Sciences stated that, "For data collections where respondents can easily skip over items if they do not wish to answer, it is not necessary to provide an explicit "prefer not to answer" response." (National Academies of Sciences, Engineering, and Medicine, 2022). Other national surveys with questions about gender identity are testing questions that do not include this response option (National Center for Health Statistics (U.S.), 2022; Office of Management and Budget, 2022).

Lastly, as public opinion about the SOGI topic changes, respondent reactions and behaviors surrounding these questions may change. NCSES should continue to consult subject matter experts to keep abreast of the changing environment and consider continued testing and research to ensure the questions and response options change as appropriate.

Coronavirus pandemic questions and response options

Questions on the production instrument that mention the coronavirus pandemic may have increased the amount of salary and income that was reported by respondents in particular occupations in comparison to Bridge Panel questions which did not reference the pandemic.

As expected, questions that referred to the coronavirus pandemic had response distributions that differed by mode. We understand the populations that choose different response modes are different and, therefore, expect to see differences in their responses.

6. Bibliography

- Bottini, C., Newman Satisky, B., & Sloan, R. (2021). *Comparison of Crowdsourcing and In-Person Cognitive Interviews for the National Survey of Children's Health*. Available upon request: U.S. Census Bureau, Demographic Statistical Methods Division, Survey Methodology.
- Bradburn, N., Sudman, S., & Wansink, B. (2004). Asking Questions. The Definitive Guide to Questionnaire Design for Market Research, Political Research, Political Polls, and Social and Health Questionnaires, revised edn. San Francisco, CA: Jossey Bass.
- Callegaro, M., Murakami, M. H., Tepman, Z., & Henderson, V. (2015). Yes-no answers versus check-all in self-administered modes: a systematic review and analysis. *International Journal of Market Research*, 57(2), pp. 203-223. DOI: 10.2501/IJMR-2015-014
- Datta, P., Walsh, K. R., & Terrell, D. (2002). The Impact of Demographics on Choice of Survey Modes: Demographic Distinctiveness between Web-Based and Telephone-Based Survey Respondents. *Communications of the Association for Information Systems*, 9(13). Retrieved from https://doi.org/10.17705/1CAIS.00913
- Federal Interagency Working Group on Improving Measurement of Sexual Orientation and Gender Identity in Federal Surveys (SOGI IWG). (2016). Evaluations of Sexual Orientation and Gender Identity Survey Measures: What Have We Learned? Retrieved from https://nces.ed.gov/FCSM/pdf/Evaluations_of_SOGI_Questions_20160923.pdf
- Hall, D., Gilary, A., & Farber, J. (2021). *Replicate Variances for the 2019 National Survey of College Graduates.* Demographic Statistical Methods Division, U.S. Census, available upon request.
- Heimel, S., Reeves, R., & Varela, K. (Forthcoming). *Results from the Web Survey Paradata Analysis for the 2021 National Survey of College Graduates.* U.S. Census Bureau, available upon request.
- Holbrook, A. (2008). Acquiescence response bias, in Lavrakas, P.J. (ed.). Encyclopedia of Survey Research Methods, 1, 3-4.
- Horwitz, R., Brockhaus, S., Henninger, F., Kieslich, P., Schierholz, M., Keusch, F., & Kreuter, F. (2020). Learning from mouse movements: Improving questionnaires and respondents' user experience through passive data collection. *Advances in questionnaire design, development, evaluation, and testing*, pp. 403-425.
- Krosnick, J. (1999). Survey research. Annual Review of Psychology, 50(1), pp. 539-567.
- Krosnick, J., & Presser, S. (2010). Question and questionnaire design, in Marsden, P.V. & Wright, J.D. (eds). *Handbook of Survey Research, 2nd edn.*, pp. 263-313.
- National Academies of Sciences, Engineering, and Medicine. (2022). *Measuring Sex, Gender Identity, and Sexual Orientation*. Washington, DC: The National Academies Press. Retrieved from https://doi.org/10.17226/26424
- National Center for Health Statistics (U.S.). (2022). Update on SOGI question design & testing. Retrieved from https://stacks.cdc.gov/view/cdc/118787
- Nicolaas, G., Campanelli, P., Hope, S., Jackle, A., & Lynn, P. (2011). *Is it a good idea to optimize question format for mode of data collection? Results from a mixed modes experiment*.

ISER working paper 2011-31. Retrieved from https://www.iser.essex.ac.uk/wp-content/uploads/files/working-papers/iser/2011-31.pdf

- Office of Management and Budget. (2022). *Collecting Sexual Orientation and Gender Identity Data: Principles and Examples.* Federal Committee on Statistical Methodology. Washington, DC.
- Office of Management and Budget. (2021). Interagency Technical Working Group on Sexual Orientation and Gender Identity Items in the Household Pulse Survey: Report and Recommendations. Retrieved from https://omb.report/icr/202106-0607-003/doc/112605500
- Rayner, K., Slattery, T., & Belanger, N. (2010). Eye movements, the perceptual span, and reading speed. *Psychon Bull Rev*, 17, 834-839.
- Reeves, R., Bottini, C., & Horwitz, R. (2022). 2021-22 National Teacher and Principal Survey Teacher Questionnaire Sexual Orientation and Gender Identity Test Paradata Results. Available upon request.
- Revilla, M., Toninelli, D., & Ochoa, C. (2015). An experiment comparing grids and item-by-item formats in web surveys completed through PC and smartphones. *Research and Expertise Centre for Survey Methodology Working Paper Number 46*.
- Smyth, J. D., Christian, L. M., & Dillman, D. A. (2008). Does 'yes or no' on the telephone mean the same as 'check-all-that-apply' on the web? *Public Opinion Quarterly*, 72(1), pp. 103-113.
- Smyth, J., Dillman, D., Christian, L., & Stern, M. (2006). Comparing check-all and forced-choice question formats in web surveys. *Public Opinion Quarterly*, 70(1), pp. 66-77.
- Sudman, S., & Bradburn, N. (1982). Asking Questions: A Practical Guide to Questionnaire Design. San Francisco, CA: Jossey-Bass.
- Thomas, R., & Klein, J. (2006). Merely incidental? Effect on response format on self-reported behavior. *Journal of Official Statistics*, 22(2), pp. 221-244.
- U.S. Census Bureau. (2019). *National Survey of College Graduates Methodology*. Retrieved from https://www.census.gov/programs-surveys/nscg/techdocumentation/methodology.html
- U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations. (2021). *National Survey of College Graduates, Internet Data Collection Instrument Screenshot Guide*. Retrieved from https://uscensus.sharepoint.com/:w:/t/nscg/EVGPNe7JyxxFlvmbJZRwhmEB-ZTatwzJFJrhaG5HbLdCoQ?CID=813547eb-73da-7814-f753-895ca2507113

Appendix A Bridge Panel sample and respondent demographic characteristics

Table 15 provides a summary of the 2021 Bridge Panel sample and respondent demographic characteristics, using demographic information available on the sampling frame from the American Community Survey (ACS).

	(Ba	Sample ase weight)	Respondents (Final weight)			
				Std.			Std.
De	mographic Characteristic	Frequency	Percent	error	Frequency	Percent	error
	White	2,900	77.7	0.3	1,600	78.7	0.5
	Black	600	8.6	0.1	200	8.2	0.3
	Asian	1,300	10.4	0.2	700	10.3	0.2
	American Indian/Alaskan Native	100	1.0	0.1	50	1.0	0.1
	Some other race	150	2.4	0.2	60	1.8	0.3
Race	Total	5,000	100.0	-	2,600	100.0	-
	Hispanic	700	9.3	0.1	300	8.9	0.3
	Not Hispanic	4,400	90.7	0.1	2,300	91.1	0.3
Hispanic Origin	Total	5,000	100.0	-	2,600	100.0	-
	0 to 29	550	11.5	0.7	250	13.1	1.0
	30 to 39	1,300	22.3	0.7	650	22.2	1.3
	40 to 49	1,200	21.0	0.7	600	19.5	1.0
	50 to 59	1,000	19.2	0.8	550	18.5	1.1
	60 to 75	950	26.0	0.8	550	26.7	1.2
Age group	Total	5,000	100.0	-	2,600	100.0	-
	U.S. citizen at birth	3,400	84.1	0.3	1,800	85.5	0.6
Citizenship status at	Not a U.S. citizen at birth	1,700	15.9	0.3	900	14.5	0.6
birth .	Total	5,000	100.0	-	2,600	100.0	-
	Now married	3,200	61.9	1.1	1,800	61.8	1.5
Marital status	Widowed	70	2.0	0.3	30	1.0	0.3

Table 15: Bridge Panel sample and respondent demographic characteristics

	Bridge Panel	(Ba	Sample se weight)	Respondents (Final weight)			
_			- ·	Std.			Std.	
Den	nographic Characteristic	Frequency	Percent	error	Frequency	Percent	error	
	Divorced	450	9.2	0.6	200	7.9	0.8	
	Separated	60	1.4	0.2	30	0.9	0.3	
	Never married	1,300	25.5	0.9	600	28.4	1.2	
	Total	5,000	100.0	-	2,600	100.0	-	
	Bachelor or Professional degree	3,000	70.2	0.1	1,400	66.6	1.0	
	Masters	1,600	25.9	0.1	950	29.2	1.1	
	Doctorate	450	3.9	0.0	300	4.2	0.3	
Highest degree	Total	5,000	100.0	-	2,600	100.0	-	
	Science and engineering degree	3,000	46.5	1.2	1,700	47.5	1.3	
Science and	No science and engineering degrees	2,100	53.5	1.2	950	52.5	1.3	
engineering degree	Total	5,000	100.0	-	2,600	100.0	-	
	Science and engineering occupation	2,700	23.6	0.4	1,600	24.0	0.7	
	Non-science and engineering occupation or							
Science and	not working	2,400	76.4	0.4	1,100	76.0	0.7	
engineering occupation	Total	5,000	100.0	-	2,600	100.0	-	

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Appendix B Paradata estimate equations

Definitions

R = Number of Respondents # = Number of

Completion Time

[1] Median Completion Time:

Breakoffs

[2] Overall Breakoff Rate:

 $\frac{R \text{ with a break of } f}{R \text{ who successfully logged in}} \times 100$

[3] Percent of Breakoffs:

$$\frac{\# break offs on screen x}{R had a break off} \times 100$$

[4] Percent of Respondent Visits with a Breakoff:

$$\frac{\# break offs on screen x}{R that visited screen x} \times 100$$

Previous Clicks

[5] Percent of Previous Clicks (of all survey items): $\frac{\# \ previous \ button \ clicks \ on \ screen \ x}{\# \ previous \ button \ clicks} \times 100$

[6] Percent of Respondent Visits with a Previous Click:

$$\frac{R \text{ with previous button clicks on screen } x}{R \text{ that visited the screen}} \times 100$$

Changed Answers

Note: Changed answers are identified at the item level and occur when a respondent:

- Deselects a checkbox that was originally selected (multi-part questions and standalone checkboxes)
- Reselects a standalone checkbox after deselecting it
- Selects an additional checkbox after a previous click (multi-part questions)
- Chooses a different radio button than originally chosen
- Enters a different write-in answer than originally entered
- Chooses a different drop-down option than originally chosen
- Returns to a screen using the previous button and answers a question for the first time

[7] Percent of Changed Answers:

$$\frac{\# changed answers on each question}{\# changed answers throughout the survey} \times 100$$

[8] Percent of Respondent Visits with a Changed Answer:

$$\frac{R \ changed \ answers \ question \ x}{R \ visited \ question \ x} \times 100$$

[9] Item Nonresponse:

Paradata Variance Estimator

[10]

$$Var(y) = \frac{4}{k} \sum_{r=1}^{k} (y_r - y_0)^2,$$

Where:

- y = the survey estimate of interest
- k = the number of replicates
- r = the replicate number
- y_r = the survey estimate using the replicate weights from replicate r
- $y_o =$ the survey estimate using the full sample weights

Appendix C Statistical testing hypotheses

We used T and chi-square tests to compare estimates from the NSCG production new cohort to the Bridge Panel.

Below are the hypotheses tests for the analysis of SOGI questions, completion times, changed answers, item nonresponse, and breakoff rates, as well as analysis of response distributions. All tests used a significance level of 10 percent (α =0.10).

T-test hypothesis test for completion times, comparisons of salary and earned income

H₀: There is no difference between the estimates for the NSCG new cohort and the Bridge Panel. $(E_{new \ coh} - E_{bridge} = 0)$ H_A: There is a difference between the estimates for the NSCG new cohort and the Bridge Panel. $(E_{new \ cohor} - E_{bridge} \neq 0)$

Rao-Scott Chi-square hypothesis test for distribution comparisons, breakoff rates, changed answers, item nonresponse, SOGI questions

 H_0 : There is no difference in the distribution for the [NSCG item] between the new cohort and Bridge Panel.

H_A: There is a difference between the distribution for the [NSCG item] NSCG new cohort and Bridge Panel.

Appendix D Difference between Production and Bridge Panel Questionnaires

Table 16 through

Table 18 below provide screenshots of every item that was different between the NSCG production and Bridge Panel questionnaires (U.S. Census Bureau, NSCG, ADDP-SO, 2021). Screens in each table are listed in the order in which they appear in the web instrument.

Table 16: Screenshot comparison of grid to item-by-item format only (no pandemic-related questions or response options)

Screen	Production		Bridge Panel	Differences
MGINTRO	Did your duties on this job require the technical expertise of a bache Select Yes or No for each item.	lor's degree or higher in	Did your duties on this job require the technical expertise of a bachelor's degree or higher in Select Yes or No for each Item.	Grid format only
	Engineering, computer science, math, or the natural sciences	Yes No	 Engineering, computer science, math, or the natural sciences Yes No The social sciences 	
	The social sciences Some other field (e.g., health, business, or education), <i>specify</i>	0 0	 Ves No 3. Some other field (e.g., health, business, or education), <i>specify</i> 	
	< Previous Next >		Yes No Yes Yes Yes Yes Yes Yes Yes No No No No	
NRINTRO	To what extent was your work on your principal job related to your <u>highes</u> Please refer to the principal job you held during the week of February 1, 20 Closely related Somewhat related Not related Did any of the following factors influence your decision to work in an area	t degree? 127. 9 outside the field of your highest degree?	Did any of the following factors influence your decision to work in an area <u>outside the field of your highest degree</u> ? 1. Pay, promotion opportunities Ves No 2. Working conditions (e.g., hours, equipment, working environment) Ves No 0. No 0. No	Grid format only
	Pay promotion opportunities	Yes No	O Yes O No	
	Working conditions (e.g., hours, equipment, working environment)	0 0	4. Change in career or professional interests Ves O No	
	Job location	0 0	5. Family-related reasons (e.g., children, spouse's job moved) O Yes O No	
	Family-related reasons (e.g., children, spouse's job moved)	0 0	6. Job in highest degree field not available Vies No	
	Job in highest degree field not available	0 0	7. Some other factor, specify O Yes	
	Some other factor, specify C Previous Next >	· ·	O No C Previous Next >	

Screen	Production			Bridge Panel	Differences
WAINTRO	The next question is about your work activities on your principal job. Which of the following work activ during a <u>tryitical</u> work week on this job? Select Ves or No for each item. Please refer to your principal job held during the week of February 1, 2021.	ities occupied at I	east 10 percent of your time	The next question is about your work activities on your principal job. Which of the following work activities occupied at least 10 percent of your time during a typical work week on this job? Select Yes or No for each item. Please refer to your principal job held during the week of February 1, 2021.	Grid format only
	Presserverter to your principal job held during the neek of February 1, 2021. Accounting, finance, contracts Basic research-study directed toward gaining scientific knowledge primarily for its own sake Applied research-study directed toward gaining scientific knowledge primarily for its own sake Development-study directed toward gaining scientific knowledge primarily for its own sake Development-study directed toward gaining scientific knowledge to meet a recognized need Development-using knowledge gained from research for the production of materials, devices Design of equipment, processes, structures, models Computer programming, systems or applications development, training Managing or supervising people or projects Professional services (e.g., health care, counseling, financial services, legal services) Sales, purchasing, marketing, customer service, public relations Quality or productivity management Teaching Other activity, specify	Yes 0 0 0 0 0 0 0 0 0 0 0 0 0	No O O O O O O O O O O O O	Please refer to your principal/lob held during the week of February 1, 2021. 1. Accounting, finance, contracts Yes No 2. Basic researchstudy directed toward gaining scientific knowledge primarily for its own sake Yes No 3. Applied researchstudy directed toward gaining scientific knowledge to meet a recognized need Yes No 4. Development—using knowledge gained from research for the production of materials, devices Yes No 5. Design of equipment, processes, structures, models Yes No 6. Computer programming, systems or applications development. Yes No 6. Computer programming, systems or applications development, training Yes No 7. Human resources-including recruiting, personnel development, training Yes No 8. Managing or supervising people or projects Yes No 9. Production, operations, maintenance (e.g., chip production, operating lab equipment) Yes No 10. Professional services (e.g., health care, counseling, financial services, legal services)	
				0 Yes	

Screen	Production					Bridge Panel	Differences
SATINTRO	SATINTRO Thinking about the principal job you held during the week of February 1, 2021, how satisfied or dissatisfied were you with the following				ow satisfied or dissatisfied were you with the following	Thinking about the principal job you held during the week of February 1, 2021, how satisfied or dissatisfied were you with the following asp	Grid format
		Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	1. Salary Very Satisfied Somewhat Satisfied Somewhat Dissatisfied	only
	Salary Benefits	0	0	0	0	Very Crissatismed 2. Benefits Very Satisfied	
	Job security	0	0	0	0	Somewhat Satisfied Somewhat Dissatisfied Very Dissatisfied	
	Job location	0	0	0	0	3. Job security ○ Very Satisfied	
	Opportunities for advancement	0	0	0	0	Somewhat Satisfied Somewhat Dissatisfied User States of the second secon	
	Intellectual challenge	0	0	0	0	4. Job Josefond	
	Level of responsibility Degree of independence	0	0	0	0	Very satisfied Somewhat Distantified Menu Distantified	
	Contribution to society	0	0	0	0	Soportunities for advancement Very Statisfied	
	< Previous	Next	>			Somewhat Satisfied Somewhat Dissatisfied Very Dissatisfied	
						6. Intellectual challenge Very Satisfied Somewhat Satisfied Somewhat Dissatisfied Very Dissatisfied	
						7. Level of responsibility Very Satisfied Somewhat Satisfied Oracle Somewhat Dissatisfied Very Dissatisfied	
						8. Degree of Independence Very Satisfied Somewhat Satisfied Oracle Satisfied Very Dissatisfied	
						9. Contribution to society Very Satisfied Somewhat Dissatisfied Very Dissatisfied Very Dissatisfied	

Screen	Production		Bridge Panel	Differences
CLICINTRO	On February 1, 2021, why did you hold this certification or license?		On February 1, 2021, why did you hold this certification or license?	Grid format
	Select Yes or No for each item.		Select Yes or No for each Item.	only
			1. To improve skills or knowledge in my current occupational field Ves	
		Yes	O No	
	To improve skills or knowledge in my current occupational field	0	2. To increase opportunities for promotion or advancement in my current occupational field	
	To increase opportunities for promotion or advancement in my current occupational field	0	No To facilitate a change to a different occupational field	
	To facilitate a change to a different occupational field	0	O Yes O No	
	Required or expected by employer	0	4. Required or expected by employer O Yes O No	
	To start my own business	0	5. To start my own business	
	Other reason, <i>specify</i>	0	O Yes O No	
			6. Other reason, <i>specify</i>	
	< Previous Next >			
			< Previous Next >	
WTRINTRO	For which of the following reasons did you take work-related training during the past 12 months	3?	For which of the following reasons did you take work-related training during the past 12 months?	Grid format
	Select Yes or No for each item.		Select Yes or No for each item.	only
		Yes	1. To improve skills or knowledge in my current occupational field	
	To improve skills or knowledge in my current occupational field	0	O Yes	
	To increase opportunities for promotion or advancement in my current occupational field	0	C. To increase opportunities for promotion or advancement in my current occupational field Ves	
	For licensure or certification in my current occupational field	0	C No	
	To facilitate a change to a different occupational field	0	3. For licensure or certification in my current occupational field	
		0	O No	
	Requirea or expected by employer	0	4. To facilitate a change to a different occupational field Ves	
	For leisure or personal interest	0	(O №	
	Other reason, <i>specify</i>	0	5. Required or expected by employer O Yes	
			O No	
			6. For leisure or personal interest Ves	
	< Previous Next >		O No	
			7. Other reason, specify Ves	
			O No	
			Previous Next >	

Screen	Production					Bridge Panel	Differences
FACINTRO	When thinking about a job, how imp	ortant is each	of the followi	ng factors to you	1?	When thinking about a job, how important is each of the following factors to you? 1. Salary User important	Grid format only
		Very important	Somewhat important	Somewhat unimportant	Not importa at all	Somewhat important Somewhat unimportant Not important all	
	Salary	0	0	0	0	Somewhat important Not important Not important at all	
	Benefits	0	0	0	0	3. Job security O Very important Somewhat important	
	Job security	0	0	0	0	Somewhat unimportant Not important all	
	Job location	0	0	0	0	4. Job location Very important Somewhat important Somewhat unimportant	
	Opportunities for advancement	0	0	0	0	Not important at all	
	Intellectual challenge	0	0	0	0	Somewhat important Somewhat important Not important Not important	
	Level of responsibility	0	0	0	0	6. Intellectual challenge ⊖ Very important	
	Degree of independence	0	0	0	0	Somewhat important Somewhat unimportant Not important at all	
	Contribution to society	0	0	0	0	7. Level of responsibility Very important Somewhat important Somewhat unimportant Not important at all	
	Previous	Next 3				8. Degree of Independence Very important Somewhat important Not important all	
						Contribution to society Very important Somewhat iminportant Not important at all	
						Previous Next >	

Screen	Production			Bridge Panel	Differences
CSINTRO	During which of the following time periods did you take courses at a community colle	ege?		During which of the following time periods did you take courses at a community college?	Grid format
	Select Yes or No for each item.			Select Yes or No for each Item.	only
			Yes	1. Before graduating from high school or earning a high school equivalency certificate Ves	
	Before graduating from high school or earning a high school equivalency certificat	te	0	○ No	
			0	2. After high school and before ever enrolling in a 4-year college or university O Yes O No.	
	After high school and before ever enrolling in a 4-year college or university		0	NO NO S. While enrolled in a 4-year college or university and before receiving my first bachelor's degree	
	While enrolled in a 4-year college or university and before receiving my first bache	elor's degree	0	○ Yes ○ No	
	After leaving a 4-year college or university without receiving my first bachelor's de	egree	0	4. After leaving a 4-year college or university without receiving my first bachelor's degree ○ Yes	
	Any time after receiving my first bachelor's degree		0	⊖ No	
				5. Any time after receiving my first bachelor's degree O Yes	
	< Previous Next >			⊖ No	
				C Previous Next >	
CCINTRO	Thinking back to the time(s) you attended community college for which of the following rea	sons did you tak	e community colle	Thinking back to the time(s) you attended community college, for which of the following reasons did you take community college course	Grid format
	Select Yes or No for each item.	<u></u>)		Select Ves or No for each item.	only
				1. To earn college credits while still attending high school	
		Yes	No	O Yes O No	
	To earn college credits while still attending high school	0	0	2. To complete an associate degree O Yes	
	To complete an associate degree	0	0	O No 3. To prepare for college/increase chance of acceptance to a 4-year college or university	
	To prepare for college/increase chance of acceptance to a 4-year college or university	0	0	O Yes O No	
	To earn credits for a bachelor's degree	0	0	4. To earn credits for a bachelor's degree O Yes	
	For financial reasons (e.g., cost of a 4-year school)	0	0	O No	
	To gain further skills or knowledge in my academic or occupational field	0	0	S. For financial reasons (e.g., cost of a 4-year school) O Yes No	
	To facilitate a change in my academic or occupational field	0	0	6. To gain further skills or knowledge in my academic or occupational field yes	
	To increase opportunities for promotion, advancement, or higher salary	0	0	O No	
	For leisure or personal interest	0	0	 7. To facilitate a change in my academic or occupational field Ves O No 	
	Other reason, specify	0	0	 To increase opportunities for promotion, advancement, or higher salary Vec 	
			۲ ۲	O No	
				9. For lasure or personal interest O Ves O No	
	< Previous Next >			10. Other reason, specify	
				U Yes	
				O No	
				d Demicrose March 1	
				NEX 2	

Screen	Production			Bridge Panel	Differences
ACINTRO	For which of the following reasons were you taking courses or enrolled? Select Yes or No for each item.			For which of the following reasons were you taking courses or enrolled? Select Yes or No for each item.	Grid format only
		Yes	No	1. To gain further education before beginning a career Q Yes A si	
	To gain further education before beginning a career	0	0	No To prepare for graduate school or further education	
	To prepare for graduate school or further education	0	0	O Yes O No	
	To change my academic or occupational field	0	0	3. To change my academic or occupational field O Ves. No	
	To gain <u>further</u> skills or knowledge in my academic or occupational field	0	0	4. To gain <u>further</u> skills or knowledge in my academic or occupational field	
	For licensure or certification	0	0	O Yes O No	
	To increase opportunities for promotion, advancement, or higher salary	0	0	S. For licensure or certification O Vies. O No	
	Required or expected by employer	0	0	6. To increase opportunities for promotion, advancement, or higher salary	
	For leisure or personal interest	0	0	O No	
	Some other reason, specify	0	0	7. Required or expected by employer O Yes O to the temployee of temployee	
	C Previous Next >			a. For leasure or personal interest Ves Na Some other reason, specify. Ves No No	
SPINTRO	Did your spouse's or partner's duties on his or her job require the tec	hnical expe	ertise of a bac	helor's degree of Did your spouse's or partner's duties on his or her job require the technical expertise of a bachelor's degree or higher in.	Grid format
	Select Yes or No for each item.			Select Yes or No for each item.	oniy
		Yes	No	1. Engineering, computer science, math or the natural sciences Ves No	
	Engineering, computer science, math or the natural sciences	0	0	2. The social sciences	
	The social sciences	0	0	 No 3. Some other field (e.g., health, business, or education), specify 	
	Some other field (e.g., health, business, or education), <i>specify</i>	0	0	○ Yes ○ No	
	< Previous Next >			< Previous Next >	

Screen	Production			Bridge Panel	Differences
CMINTRO	Which factors were important in your decision to first come to the United States for six months or longer? Select Yes or No for each item.			Which factors were important in your decision to first come to the United States for six months or longer? Select Yes or No for each item.	Grid format only
		Yes	No	I. Family-related reasons Ves No	
	Family-related reasons	0	0	2. Educational opportunities in the United States	
	Educational opportunities in the United States	0	0	O No	
	Job or economic opportunities	0	0	3. Job or economic opportunities Ves No	
	Scientific or professional infrastructure in my field	0	0	4. Scientific or professional infrastructure in my field Ves	
	It was not my decision	0	0		
	Some other reason, <i>specify</i>	0	0	 It was not my decision Yes No 	
				6. Some other reason, <i>specify</i> Ves	
	<pre> Previous Next > </pre>			O. No	
				< Previous Next >	

Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021

Table 17: Screenshot comparisons of SOGI questions

Screen	Production	Bridge Panel	Differences
GENDER (i.e.,			Changed
Sex)	What is your sex? Help	What sex were you assigned at birth, on your original birth certificate?	question
(Production)	 Male Female 	 Male Female Don't know 	about sex and added
BIRTH_GENDER	Previous Next >	Previous Next >	question
(i.e., Birth Sex)			
NOW_GENDER			
(i.e., Current			
Gender)			
(Bridge Panel)			

Screen	Production	Bridge Panel	Differences
		What is your current gender identity? Select all that apply. Male Female Transgender Gender non-conforming Non-binary Genderfluid Genderqueer Other gender identity, specify Prefer not to answer Yerevious	
ORIENTATION (i.e., Sexual Orientation)	Not on production	Regardless of your sexual experience, what is your sexual identity or orientation? Select all that apply. Lesbian or gay Straight, that is, not gay Bisexual Pansexual Fluid Queer Other sexual orientation, specify Prefer not to answer K Previous	Added to Bridge Panel

Source: U.S. Census Bureau, National Survey of College Graduates, Associate Director for Demographic Programs – Survey Operations, 2021

	Table 18: Screenshot com	parison of coronavi	rus pandemic-related	questions
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Screen	Production		Bridge Panel	Differences
NWINTRO	During the week of February 1, 2021, what were your reasons for not working?		During the week of February 1, 2021, what were your reasons for not working?	Pandemic-related
		Yes No	1. Retired	items
	Retired	0 0	O No	
	On layoff from a job due to the coronavirus pandemic	0 0	2. On layoff from a job O Yes	Grid format
	On layoff from a job for reasons unrelated to the coronavirus pandemic	0 0	O No 3 Student	
	Student	0 0	O Yes O No	
	Family responsibilities due to the coronavirus pandemic (e.g. childcare, eldercare)	0 0	4. Family responsibilities	
	Family responsibilities unrelated to the coronavirus pandemic	0 0	O Yes O No	
	Chronic illness or permanent disability	0 0	5. Chronic illness or permanent disability	
	Suitable job not available	0 0	O No.	
	Did not need or want to work	0 0	6. Suitable job not available Ves	
	Other reason, specify	0 0	O No 7. Did not need or want to work	
			O Yes O No	
			8. Other reason, specify	
	< Previous Next >		O Yes	
			O Nu	
			K Previous Next >	
SALCOV1	For the principal job you held during the week of February 1, 2021, has your basic annual salary been	affected at any time by the coronavirus pandemic?	Not included in the Bridge Panel	Not included in
	○ Yes ○ No			the Bridge Panel
	C Pravious Next 5			
			Net included in the Duidee Denel	Not included in
SALEFF	Did the salary you provided reflect the effects of the coronavirus p	andemic?	Not included in the Bridge Panel	the Bridge Panel
	Yes, the salary I provided reflects changes due to the coronavirul	is pandemic		the bridge ranei
	O No, I provided my usual salary	2		
	Yerevious Next >			
SALCOV2			Not included in the Bridge Panel	Not included in
	How has your basic annual salary been affected by the coronavirus pandemic?		U U	the Bridge Panel
	 It is currently decreased It was increased temporarily but has returned to normal 			
	 It is currently increased It is currently increased 			
	O there specify			
	C Previous			

Screen	Production		Br	ridge Panel	Differences
SALDEC	By how much did your salary decrease due to the pandemic? Your best estimate is fine		No	ot included in the Bridge Panel	Not included in the Bridge Panel
	It decreased by \$00				
	Previous Next >				
SALINC	By how much did your salary increase due to the pandemic?		No	ot included in the Bridge Panel	Not included in the Bridge Panel
	Your best estimate is fine				
	It increased by \$00				
	< Previous Next >				
PJINTRO	Did you want to work 35 or more hours per week on your principal job? O Yes O No Why did you usually work fewer than 35 hours?			Did you want to work 35 or more hours per week on your principal job? Yes No	Pandemic-related items
	Select Yes or No for each item.		w	Why did you usually work fewer than 35 hours?	Grid format
		Yes No	S	Select Yes or No for each item.	
	Previously retired or semi-retired	0 0	1.	. Previously retired or semi-retired	
	Student	0 0	C) Yes) No	
	Family responsibilities due to the coronavirus pandemic (e.g. childcare, eldercare)	0 0	2	2 Student	
	Family responsibilities unrelated to the coronavirus pandemic	0 0) Yes) No	
	Full-time job not available unrelated to the coronavirus pandemic	0 0	3.	8. Family responsibilities	
	Hours or work reduced due to the coronavirus pandemic	0 0	C	No	
	Hours or work reduced unrelated to the coronavirus pandemic	0 0	4.	I. Full-time job not available	
	Held more than one job	0 0		⊃ No	
	Did not need or want to work more hours	0 0	5.	5. Held more than one job	
	Other reason, specify	0 0	C) Yes) No	
			6. C	 Did not need or want to work more hours Yes No 	
			7.	7. Other reason, <i>specify</i> > Yes	
			C) No	

Screen	Production	Bridge Panel	Differences
BFTINTRO	Thinking of your principal job during the week of February 1, 2021, which of the following benefits were available to you, even if you chose not to them?	Thinking of your principal job during the week of February 1, 2021, which of the following benefits were an them?	Pandemic-related items
	Select res to No no cautinem. Yes No	Select Yes or No for each item. 1. Health insurance that was at least partially paid by your employer Ves	Grid format
	Health insurance that was at least partially paid by your employer	○ No	
	A pension plan or a retirement plan to which your employer contributed	2. A pension plan or a retirement plan to which your employer contributed Ves No	
	A profit-sharing plan O	3. A profit-sharing plan Ves No	
	Paid vacation, sick, or personal days unrelated to the coronavirus pandemic	4. Paid vacation, sick, or personal days Ves No	
	< Previous Next >	< Previous Next >	
TELEW	Thinking of your principal job during the week of February 1, 2021, which of the following best describes whether you were allowed or retelecommute/work remotely? I was allowed or required to telecommute/work remotely due to the coronavirus pandemic I was allowed or required to telecommute/work remotely regardless of the coronavirus pandemic I was not allowed or required to telecommute/work remotely Telecommuting/working remotely did not make sense for my job	Not included in the Bridge Panel	Not included in the Bridge Panel
	<pre></pre>		
ERNCOV1	How was your total earned income for 2020 affected by the coronavirus pandemic? It increased It decreased It was not affected 	Not included in the Bridge Panel	Not included in the Bridge Panel
ERNDEC	By how much did your income for 2020 decrease due to the pandemic? Your best estimate is fine It decreased by \$00 < Previous Next >	Not included in the Bridge Panel	Not included in the Bridge Panel
ERNINC	By how much did your income for 2020 increase due to the pandemic? Your best estimate is fine It increased by \$00 < Previous Next >	Not included in the Bridge Panel	Not included in the Bridge Panel

Screen	Production			Bridge Panel	Differences
CHINTRO	Why did you change your employer or your job between the week of February 1, 2019 and the week of February 1, 2021? Select Yes or No for each item.			Why did you change your employer or your job between the week of February 1, 2019 and the week of Febr Select Yes or No for each item.	Pandemic-related items
	Pay, promotion opportunities	Ves O	No O	1. Pay, promotion opportunities Ves No	Grid format
	Working conditions (e.g., hours, equipment, working environment)	0	0	2. Working conditions (e.g., hours, equipment, working environment) Ves No	
	Job location Change in career or professional interests	0	0	3. Job location ○ Yes ○ No	
	Family-related reasons due to the coronavirus pandemic (e.g., childcare, eldercare) Family-related reasons unrelated to the coronavirus sandemic (e.g., childran, socuse's lob moved)	0	0	4. Change in career or professional interests	
	School-related reasons (e.g., returned to school, completed a degree)	0	0	5. Family-related reasons (e.g., children, spouse's job moved) O Yes	
	Laid off or job terminated due to the coronavirus pandemic Laid off or job terminated for reasons other than the coronavirus pandemic (includes company closings, mergers,	0	0	 No 6. School-related reasons (e.g., returned to school, completed a degree) Yes 	
	Refired	0	0	O No 7. Laid off or job terminated (includes company closings, mergers, buyouts, grant or contract ended) O Yes	
	Some date reason, spectry C Previous Next >	0	0	8. Retired Yes No 9. Some other reason, <i>specify</i> Yes No	
PROMTGI	During the past 12 months, did you attend any professional conferences or professional society or Include regional, national, or international meetings. Yes, I attended in person or virtually (i.e., online or by remote access) No To how many regional, national, or international professional societies or associations do you current if none, enter "0" <	association	neetings?		Response changed from "Yes, I attended in person or virtually" to "Yes"



Appendix E Item nonresponse rates for grid and item-by-item formats, and SOGI

Table 19 and Table 20 contain item nonresponse rates for the grid and SOGI analyses. Items within Table 17 are listed in the order they appear in the NSCG production or Bridge Panel survey.

			G (Prod	rid uction)	Item-l (Bridg	by-item e Panel)	
Question (Census question ID)	ltem	Value	Percent	Std. error	Percent	Std. Error	Chi-square p-value
	Factor and a second second second	Missing	13.5	0.5	5.7	0.8	
	or the natural sciences	Not missing	86.5	0.5	94.3	0.8	
Did vour duties on this iob		Total	100.0	-	100.0	-	*<.0001
require the technical		Missing	17.1	0.5	9.1	0.9	
expertise of a bachelor's	The social sciences	Not missing	82.9	0.5	90.9	0.9	
degree or higher in		Total	100.0	-	100.0	-	*<.0001
(MGINTKO)	Some other field (o.g. health	Missing	9.0	0.3	9.2	1.0	
	business, or education), specify	Not missing	91.0	0.3	90.8	1.0	
		Total	100.0	-	100.0	-	0.7988
	Pay, promotion opportunities	Missing	12.0	1.2	2.7	1.9	
		Not missing	88.0	1.2	97.3	1.9	
		Total	100.0	-	100.0		*0.0154
	Working conditions (e.g., hours, equipment, working environment)	Missing	15.3	1.3	3.3	1.8	
		Not missing	84.7	1.3	96.7	1.8	
		Total	100.0	-	100.0	-	*0.0015
Did any of the following		Missing	14.6	1.2	5.6	1.8	
factors influence your	Job location	Not missing	85.4	1.2	94.4	1.8	
outside the field of your highest degree? (NRINTRO)		Total	100.0	-	100.0	-	*0.0018
	Change in excess or professional	Missing	14.5	1.3	3.1	1.9	
	interests	Not missing	85.5	1.3	96.9	1.9	
		Total	100.0	-	100.0	-	*0.0041
	Eamily related reasons (o.g., children	Missing	19.5	1.6	5.0	1.8	
	spouse's job moved)	Not missing	80.5	1.6	95.0	1.8	
		Total	100.0	-	100.0	-	*<.0001
		Missing	18.6	1.5	4.9	2.3	*0.0011

			G (Prod	rid uction)	Item- (Bridg	by-item e Panel)	
Question (Census question ID)	ltem	Value	Percent	Std. error	Percent	Std. Error	Chi-square p-value
	Job in highest degree field not	Not missing	81.4	1.5	95.1	2.3	
	available	Total	100.0	-	100.0	-	
		Missing	28.8	1.6	23.9	3.8	
	Some other factor, specify	Not missing	71.2	1.6	76.1	3.8	
		Total	100.0	-	100.0	-	0.2820
		Missing	10.0	0.4	4.4	0.7	
	Accounting, finance, contracts	Not missing	90.0	0.4	95.6	0.7	
		Total	100.0	-	100.0	-	*<.0001
	Basic researchstudy directed toward	Missing	14.2	0.5	6.1	0.8	
	gaining scientific knowledge primarily	Not missing	85.8	0.5	93.9	0.8	
	for its own sake	Total	100.0	-	100.0	-	*<.0001
	Applied researchstudy directed toward gaining scientific knowledge to meet a recognized need	Missing	13.9	0.5	7.4	1.0	
		Not missing	86.1	0.5	92.6	1.0	
		Total	100.0	-	100.0	-	*<.0001
	Developmentusing knowledge gained from research for the production of materials, devices	Missing	13.4	0.5	6.3	0.9	
The next question is about		Not missing	86.6	0.5	93.7	0.9	
principal job. Which of the		Total	100.0	-	100.0	-	*<.0001
following work activities		Missing	13.7	0.5	6.6	0.9	
occupied at least 10 percent	Design of equipment, processes, structures, models	Not missing	86.3	0.5	93.4	0.9	
of your time during a typical		Total	100.0	-	100.0	-	*<.0001
(WAINTRO)		Missing	13.9	0.5	6.4	1.0	
(11/11/10)	Computer programming, systems or	Not missing	86.1	0.5	93.6	1.0	
	applications development	Total	100.0	-	100.0	-	*<.0001
	Human resourcesincluding	Missing	13.0	0.5	5.6	0.8	
	recruiting, personnel development,	Not missing	87.0	0.5	94.4	0.8	
	training	Total	100.0	-	100.0	-	*<.0001
		Missing	8.2	0.4	3.7	0.6	
	projects	Not missing	91.8	0.4	96.3	0.6	
	P. 5,5000	Total	100.0	-	100.0	-	*<.0001
		Missing	15.4	0.5	8.3	1.1	
		Not missing	84.6	0.5	91.7	1.1	*<.0001

			G (Prod	rid uction)	ltem-	by-item e Panel)	
Question			(FIOU		(Dridg	e raneij	Chi-square
(Census question ID)	Item	Value	Percent	Std. error	Percent	Std. Error	p-value
	Production, operations, maintenance (e.g., chip production, operating lab	Total	100.0	_	100.0	_	
	Drefessional services (e.g. health	Missing	12.0	0.5	4 7	0.7	
	care, counseling, financial services,	Not missing	88.0	0.5	95.3	0.7	
	legal services)	Total	100.0	-	100.0	-	*<.0001
	Salas nurchasing marketing	Missing	12.7	0.5	6.4	0.9	
	customer service, public relations	Not missing	87.3	0.5	93.6	0.9	
		Total	100.0	-	100.0	-	*<.0001
		Missing	14.2	0.5	6.8	0.9	
	Quality or productivity management	Not missing	85.8	0.5	93.2	0.9	
		Total	100.0	-	100.0	-	*<.0001
		Missing	14.0	0.5	6.3	0.9	
	Teaching	Not missing	86.0	0.5	93.7	0.9	
		Total	100.0	-	100.0	-	*<.0001
		Missing	33.0	0.7	29.9	1.7	
	Other activity, specify	Not missing	67.0	0.7	70.1	1.7	
		Total	100.0	-	100.0	-	0.1266
		Missing	0.5	0.1	0.3	0.1	
	Salary	Not missing	99.5	0.1	99.7	0.1	
		Total	100.0	-	100.0	-	0.1448
		Missing	1.2	0.2	0.5	0.2	
Thinking about the principal	Benefits	Not missing	98.8	0.2	99.5	0.2	
job you held during the week		Total	100.0	-	100.0	-	*0.0642
of February 1, 2021, how satisfied or dissatisfied were you with the following aspects of the job? (SATINTRO)		Missing	0.7	0.1	0.3	0.1	
	Job security	Not missing	99.3	0.1	99.7	0.1	
		Total	100.0	-	100.0	-	*0.0308
		Missing	0.5	0.1	0.4	0.2	
	Job location	Not missing	99.5	0.1	99.6	0.2	
		Total	100.0	-	100.0	-	0.5340
	Opportunities for advancement	Missing	1.2	0.1	0.6	0.2	
		Not missing	98.8	0.1	99.4	0.2	*0.0585

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			G (Prod	rid uction)	ltem-l	by-item e Panel)	
Question			(PIOU		(Driug	e Fallelj	Chi-square
(Census question ID)	Item	Value	Percent	Std. error	Percent	Std. Error	p-value
		Total	100.0	-	100.0	-	
		Missing	0.8	0.1	0.6	0.2	
	Intellectual challenge	Not missing	99.2	0.1	99.4	0.2	
		Total	100.0	-	100.0	-	0.3946
		Missing	0.6	0.1	0.3	0.1	
	Level of responsibility	Not missing	99.4	0.1	99.7	0.1	
		Total	100.0	-	100.0	-	*0.0606
		Missing	0.6	0.1	0.4	0.1	
	Degree of independence	Not missing	99.4	0.1	99.6	0.1	
		Total	100.0	-	100.0	-	0.2593
		Missing	0.8	0.1	0.6	0.2	
	Contributions to society	Not missing	99.2	0.1	99.4	0.2	
		Total	100.0	-	100.0	-	0.5844
	To improve skills or knowledge in my current occupational field	Missing	13.3	0.8	7.7	1.6	
		Not missing	86.7	0.8	92.3	1.6	
		Total	100.0	-	100.0	-	*0.0076
	To increase opportunities for promotion or advancement in my current occupational field	Missing	14.7	0.8	7.7	1.6	
		Not missing	85.3	0.8	92.3	1.6	
		Total	100.0	-	100.0	-	*0.0018
	To facilitate a change to a different	Missing	17.8	0.9	10.4	1.9	
On Fahrman 1, 2021 why did	occupational field	Not missing	82.2	0.9	89.6	1.9	
on February 1, 2021, why did		Total	100.0	-	100.0	-	*0.0023
license? (CLICINTRO)		Missing	8.4	0.6	6.5	1.3	
	Required or expected by employer	Not missing	91.6	0.6	93.5	1.3	
		Total	100.0	-	100.0	-	0.2262
		Missing	19.4	0.9	11.3	1.8	
	To start my own business	Not missing	80.6	0.9	88.7	1.8	
		Total	100.0	-	100.0	-	*0.0009
		Missing	34.6	1.2	35.5	2.7	
	Other reason, specify	Not missing	65.4	1.2	64.5	2.7	
		Total	100.0	-	100.0	-	0.7646

			G (Prod	rid uction)	ltem-l (Bridg	by-item e Panel)	
Question			(1100		(51145)		Chi-square
(Census question ID)	Item	Value	Percent	Std. error	Percent	Std. Error	p-value
		Missing	3.4	0.4	1.8	0.5	
	To improve skills or knowledge in my	Not missing	96.6	0.4	98.2	0.5	
		Total	100.0	-	100.0	-	*0.0397
	To increase opportunities for	Missing	10.5	0.6	4.6	1.1	
	promotion or advancement in my	Not missing	89.5	0.6	95.4	1.1	
	current occupational field	Total	100.0	-	100.0	-	*0.0003
	For linear an oratification in and	Missing	9.6	0.6	5.2	1.1	
	For licensure or certification in my	Not missing	90.4	0.6	94.8	1.1	
		Total	100.0	-	100.0	-	*0.0030
For which of the following		Missing	13.5	0.6	6.7	1.2	
reasons did you take work-	occupational field	Not missing	86.5	0.6	93.3	1.2	
past 12 months? (WTRINTRO)		Total	100.0	-	100.0	-	*<.0001
		Missing	7.9	0.5	3.2	0.8	
	Required or expected by employer	Not missing	92.1	0.5	96.8	0.8	
		Total	100.0	-	100.0	-	*0.0002
		Missing	12.3	0.7	5.1	1.0	
	For leisure or personal interest	Not missing	87.7	0.7	94.9	1.0	
		Total	100.0	-	100.0	-	*<.0001
		Missing	38.4	1.1	34.1	2.4	
	Other reason, specify	Not missing	61.6	1.1	65.9	2.4	
		Total	100.0	-	100.0		*0.0959
		Missing	1.3	0.2	0.7	0.2	
	Salary	Not missing	98.7	0.2	99.3	0.2	
		Total	100.0	-	100.0	-	*0.0263
When thinking about a job,		Missing	1.4	0.2	1.2	0.3	
how important is each of the	Benefits	Not missing	98.6	0.2	98.8	0.3	
following factors to you?		Total	100.0	-	100.0	-	0.7011
(FACINTRO)		Missing	1.7	0.2	1.5	0.4	
	Job security	Not missing	98.3	0.2	98.5	0.4	
		Total	100.0	-	100.0	-	0.7743
	Job location	Missing	1.7	0.2	1.2	0.3	0.1986

			Grid (Production)		Item-by-item (Bridge Panel)		
Question				,			Chi-square
(Census question ID)	Item	Value	Percent	Std. error	Percent	Std. Error	p-value
		Not missing	98.3	0.2	98.8	0.3	
		Total	100.0	-	100.0	-	
		Missing	2.1	0.2	1.3	0.3	
	Opportunities for advancement	Not missing	97.9	0.2	98.7	0.3	
		Total	100.0	-	100.0	-	*0.0496
		Missing	1.6	0.2	1.4	0.4	
	Intellectual challenge	Not missing	98.4	0.2	98.6	0.4	
		Total	100.0	-	100.0	-	0.6935
		Missing	1.8	0.2	1.0	0.2	
	Level of responsibility	Not missing	98.2	0.2	99.0	0.2	
		Total	100.0	-	100.0	-	*0.0361
	Degree of independence	Missing	1.6	0.2	1.0	0.2	
		Not missing	98.4	0.2	99.0	0.2	
		Total	100.0	-	100.0	-	*0.0825
	Contribution to society	Missing	1.7	0.2	0.9	0.3	
		Not missing	98.3	0.2	99.1	0.3	
		Total	100.0	-	100.0	-	*0.0390
	Before graduating from high school or	Missing	3.7	0.4	2.2	0.7	
	earning a high school equivalency	Not missing	96.3	0.4	97.8	0.7	
	certificate	Total	100.0	-	100.0	-	0.1203
	After high school and before ever	Missing	4.8	0.4	2.6	0.7	
	enrolling in a 4-year college or	Not missing	95.2	0.4	97.4	0.7	
During which of the following	university	Total	100.0	-	100.0	-	*0.0345
time periods did you take	While enrolled in a 4-year college or	Missing	6.4	0.5	3.7	0.9	
courses at a community	university and before receiving my	Not missing	93.6	0.5	96.3	0.9	
college? (CSINTRO)	first bachelor's degree	Total	100.0	-	100.0	-	*0.0184
	After leaving a 4-year college or	Missing	8.7	0.6	5.9	1.0	
	university without receiving my first	Not missing	91.3	0.6	94.1	1.0	
	bachelor's degree	Total	100.0	-	100.0	-	*0.0334
	Any time after receiving my first	Missing	6.5	0.5	3.6	1.0	
	bachelor's degree	Not missing	93.5	0.5	96.4	1.0	*0.0302

			G (Prod	rid uction)	Item- (Bridg	Item-by-item (Bridge Panel)		
Question (Census question ID)	ltem	Value	Percent	Std. error	Percent	Std. Error	Chi-square p-value	
		Total	100.0	-	100.0	-		
	To earn college credits while still	Missing	6.8	0.5	3.5	0.8		
		Not missing	93.2	0.5	96.5	0.8		
		Total	100.0	-	100.0	-	*0.0058	
	To complete an associate degree	Missing	6.8	0.5	3.8	0.9		
		Not missing	93.2	0.5	96.2	0.9		
		Total	100.0	-	100.0	-	*0.0155	
	To prepare for college/increase change of acceptance to a 4-year college or university	Missing	6.5	0.5	3.7	0.9		
		Not missing	93.5	0.5	96.3	0.9		
		Total	100.0	-	100.0	-	*0.0286	
	To earn credits for a bachelor's degree	Missing	5.1	0.4	1.8	0.4		
		Not missing	94.9	0.4	98.2	0.4	*<.0001	
		Total	100.0	-	100.0	-		
Thinking back to the time(s)	For financial reasons (e.g., cost of a 4- year school)	Missing	6.8	0.5	3.2	0.8		
you attended community		Not missing	93.2	0.5	96.8	0.8		
college, for which of the		Total	100.0	-	100.0	-	*0.0023	
following reasons did you	To gain further skills or knowledge in	Missing	6.7	0.5	3.9	1.0		
take community college		Not missing	93.3	0.5	96.1	1.0		
courses! (CCINTRO)		Total	100.0	-	100.0	-	*0.0315	
	To facilitate a change in my academia	Missing	8.0	0.5	4.3	0.8		
	or occupational field	Not missing	92.0	0.5	95.7	0.8		
		Total	100.0	-	100.0	-	*0.0021	
	To increase opportunities for	Missing	8.2	0.5	4.0	0.8		
	promotion, advancement, or higher	Not missing	91.8	0.5	96.0	0.8		
	salary	Total	100.0	-	100.0	-	*0.0010	
		Missing	7.7	0.5	4.0	0.9		
	For leisure or personal interest	Not missing	92.3	0.5	96.0	0.9		
		Total	100.0	-	100.0	-	*0.0042	
		Missing	29.1	0.9	30.0	2.1		
	Other reason, specify	Not missing	70.9	0.9	70.0	2.1		
		Total	100.0	-	100.0	-	0.6987	

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			G (Prod	rid uction)	ltem- (Bridg		
Question (Census question ID)	ltem	Value	Percent	Std. error	Percent	Std. Error	Chi-square p-value
	To gain further education before	Missing	7.5	1.5	5.3	3.0	
		Not missing	92.5	1.5	94.7	3.0	
		Total	100.0	-	100.0	-	0.5602
		Missing	10.5	1.7	5.5	3.2	
	To prepare for graduate school or further education	Not missing	89.5	1.7	94.5	3.2	
		Total	100.0	-	100.0	-	0.2763
	Ta alaman and an is an	Missing	10.7	1.9	4.3	2.8	
	To change my academic or	Not missing	89.3	1.9	95.7	2.8	
		Total	100.0	-	100.0	-	0.1646
	To pain further skills on languages in	Missing	9.7	1.9	4.6	3.1	
	my academic or occupational field	Not missing	90.3	1.9	95.4	3.1	
		Total	100.0	-	100.0	-	0.2865
For which of the following	For licensure or certification	Missing	11.8	2.1	4.9	2.8	
courses or enrolled? (ACINTRO)		Not missing	88.2	2.1	95.1	2.8	
		Total	100.0	-	100.0	-	0.1411
	To increase opportunities for promotion, advancement, or higher salary	Missing	8.0	1.8	4.6	3.1	
		Not missing	92.0	1.8	95.4	3.1	
		Total	100.0	-	100.0	-	0.4282
		Missing	14.7	2.2	5.1	3.1	
	Required or expected by employer	Not missing	85.3	2.2	94.9	3.1	
		Total	100.0	-	100.0	-	*0.0742
		Missing	11.8	1.8	5.7	3.2	
	For leisure or personal interest	Not missing	88.2	1.8	94.3	3.2	
		Total	100.0	-	100.0	-	0.1984
		Missing	37.4	2.8	43.9	6.0	
	Some other reason, specify	Not missing	62.6	2.8	56.1	6.0	
		Total	100.0	-	100.0	-	0.3095
Did your spouse's or	Engineering computer science math	Missing	15.5	0.6	12.3	1.4	
partner's duties on his or her	or the natural sciences	Not missing	84.5	0.6	87.7	1.4	
job require the technical		Total	100.0	-	100.0	-	*0.0480
expertise of a bachelor's	The social sciences	Missing	20.4	0.7	16.2	1.5	*0.0168

			Grid (Production)		Item-by-item (Bridge Panel)		
Question (Census question ID)	ltem	Value	Percent	Std. error	Percent	Std. Error	Chi-square p-value
degree or higher in		Not missing	79.6	0.7	83.8	1.5	
(SPINTRO)		Total	100.0	-	100.0	-	
		Missing	11.0	0.6	16.2	1.9	
	Some other field (e.g., health,	Not missing	89.0	0.6	83.8	1.9	
	business, or education, specify	Total	100.0	-	100.0	-	*0.0025
		Missing	26.8	1.9	13.0	3.1	
	Family-related reasons	Not missing	73.2	1.9	87.0	3.1	
		Total	100.0	-	100.0	-	*0.0015
	Educational opportunities in the United States	Missing	27.5	2.1	14.6	3.1	
		Not missing	72.5	2.1	85.4	3.1	
		Total	100.0	-	100.0	-	*0.0016
	Jobs or economic opportunities	Missing	27.2	2.0	14.8	3.1	
Which factors were		Not missing	72.8	2.0	85.2	3.1	
first come to the United		Total	100.0	-	100.0	-	*0.0039
States for six months or		Missing	37.7	2.4	18.8	3.4	
longer? (CMINTRO)	infrastructure in my field	Not missing	62.3	2.4	81.2	3.4	
		Total	100.0	-	100.0	-	*<.0001
		Missing	40.1	2.3	18.5	3.4	
	It was not my decision	Not missing	59.9	2.3	81.5	3.4	
		Total	100.0	-	100.0	-	*<.0001
		Missing	45.8	1.9	38.1	4.2	
	Some other reason, specify	Not missing	54.2	1.9	61.9	4.2	
		Total	100.0	-	100.0	-	*0.0878

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared item nonresponse distributions for grid (production) and item-by-item (Bridge Panel)

Table 20: Item nonresponse rates for SOGI

		Production		Bridg	e Panel
Question	Value	Percent	Std. error	Percent	Std. error
,	Missing	0.5	0.1	-	-
Sex	Not missing	99.5	0.1	-	-
	Total	100.0	-	-	-
Birth Sex	Missing	-	-	0.4	0.2
	Not missing	-	-	99.6	0.2
	Total	-	-	100.0	-
Current	Missing	-	-	0.6	0.2
Gender	Not missing	-	-	99.4	0.2
Gender	Total	-	-	100.0	-
Covuel	Missing	-	-	2.1	0.5
Orientation	Not missing	-	-	97.9	0.5
Unentation	Total	_	-	100.0	_

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

Appendix F Response distributions for grid and item-by-item, SOGI, and coronavirus questions, and coronavirus questions by mode

Table 21 to Table 30 provide response distributions and standard errors for the grid and item-by-item, SOGI, coronavirus, and coronavirus by mode analyses.

Grid and item-by-item

Table 21: Response distributions for grid and item-by-item

			Grid		Item-by-item		
			(Produ	ction)	(Bridge	Panel)	
Question (Census				Std.		Std.	Chi-square
question ID)	Item	Value	Percent	error	Percent	error	p-value
	Engineering, computer science, math, or the	Yes	32.2	0.7	32.6	1.5	
Did your duties on this	natural sciences	No	67.8	0.7	67.4	1.5	0.7774
job require the		Yes	18.1	0.5	19.1	1.5	
bachelor's degree or	The social sciences	No	81.9	0.5	80.9	1.5	0.5459
higher in (MGINTRO)	Some other field (e.g., health, business, or	Yes	46.5	0.7	47.0	1.9	
	education), specify	No	53.5	0.7	53.0	1.9	0.8108
		Yes	50.9	1.9	55.2	4.6	
	Pay, promotion opportunities	No	49.1	1.9	44.8	4.6	0.3814
	Working conditions (e.g., hours, equipment, working environment)	Yes	49.7	1.7	53.2	4.1	
		No	50.3	1.7	46.8	4.1	0.4532
Did any of the	Job location	Yes	46.7	1.7	57.8	3.9	
following factors		No	53.3	1.7	42.2	3.9	*0.0198
influence your decision	Change in career or professional interests	Yes	44.8	1.9	47.5	4.1	
outside the field of		No	55.2	1.9	52.5	4.1	0.5336
your highest degree? (NRINTRO)	Family-related reasons (e.g., children,	Yes	24.9	1.3	27.4	3.3	
	spouse's job moved)	No	75.1	1.3	72.6	3.3	0.4943
		Yes	31.1	1.5	32.4	3.9	
	Job in highest degree field not available	No	68.9	1.5	67.6	3.9	0.7499
		Yes	10.9	1.3	4.6	1.9	
	Some other factor, specify	No	89.1	1.3	95.4	1.9	*0.0208
The next question is		Yes	34.8	0.7	34.7	1.9	
about your work	Accounting, finance, contracts	No	65.2	0.7	65.3	1.9	0.9401

			Grid		Item-by-item		
			(Produ	ction)	(Bridge	Panel)	
Question (Census				Std.		Std.	Chi-square
question ID)	Item	Value	Percent	error	Percent	error	p-value
activities on your principal job. Which of	Basic researchstudy directed toward gaining scientific knowledge primarily for its	Yes	21.8	0.6	24.9	1.6	
the following work	own sake	No	78.2	0.6	75.1	1.6	*0.0642
activities occupied at least 10 percent of	Applied researchstudy directed toward gaining scientific knowledge to meet a	Yes	26.2	0.6	27.8	1.6	-
your time during a	recognized need	No	73.8	0.6	72.2	1.6	0.3548
typical work week on this job? (WAINTRO)	Developmentusing knowledge gained from research for the production of materials, devices	Yes	26.7	0.6	29.3	1.7	
		No	73.3	0.6	70.7	1.7	0.1563
	Design of equipment, processes, structures, models	Yes	21.2	0.6	23.6	1.7	
		No	78.8	0.6	76.4	1.7	0.1606
	Computer programming, systems, or applications development	Yes	17.5	0.5	20.4	1.4	_
		No	82.5	0.5	79.6	1.4	*0.0350
	Human resourcesincluding recruiting, personnel development, training Managing or supervising people or projects Production, operations, maintenance (e.g., chip production, operating lab equipment)	Yes	28.0	0.7	31.2	1.9	
		No	72.0	0.7	68.8	1.9	0.1106
		Yes	58.0	0.8	57.8	1.6	
		No	42.0	0.8	42.2	1.6	0.9014
		Yes	11.5	0.5	12.3	1.1	
		No	88.5	0.5	87.7	1.1	0.4534
	Professional services (e.g., health care, counseling, financial services, legal services)	Yes	37.0	0.8	43.1	1.6	
		No	63.0	0.8	56.9	1.6	*0.0004
	Sales, purchasing, marketing, customer	Yes	35.0	0.8	38.1	1.9	
	service, public relations	No	65.0	0.8	61.9	1.9	0.1280
		Yes	24.7	0.6	28.7	1.9	-
	Quality or productivity management	No	75.3	0.6	71.3	1.9	*0.0448
		Yes	32.2	0.6	32.8	1.8	
	Teaching	No	67.8	0.6	67.2	1.8	0.7309
		Yes	6.5	0.4	5.4	0.7	
	Other activity, specify	No	93.5	0.4	94.6	0.7	0.2757
Thinking about the		1 Very Satisfied	29.9	0.7	27.8	1.7	
principal job you held		2 Somewhat Satisfied	48.3	0.8	49.6	1.8	
during the week of	Salary	3 Somewhat Dissatisfied	15.0	0.6	16.7	1.3	0.4646

			Grid		Item-by-item		
Question (Consus			(Produ	ction)	(Bridge	Panel)	Chi anuara
question (Census	ltem	Value	Percent	error	Percent	error	p-value
February 1, 2021, how		4 Very Dissatisfied	6.7	0.4	6.0	0.9	
satisfied or dissatisfied		1 Very Satisfied	40.4	0.8	43.3	1.8	
were you with the following aspects of		2 Somewhat Satisfied	39.3	0.7	40.1	1.7	
the job?	Benefits	3 Somewhat Dissatisfied	12.5	0.5	10.2	1.0	
(SATINTRO)		4 Very Dissatisfied	7.8	0.4	6.5	0.9	0.1160
		1 Very Satisfied	53.6	0.8	55.2	1.7	
		2 Somewhat Satisfied	35.1	0.9	35.9	1.6	
		3 Somewhat Dissatisfied	7.5	0.4	6.9	0.9	
	Job security	4 Very Dissatisfied	3.9	0.3	2.0	0.5	*0.0172
		1 Very Satisfied	64.1	0.6	66.4	1.9	
		2 Somewhat Satisfied	27.2	0.6	27.3	1.7	
		3 Somewhat Dissatisfied	6.7	0.4	5.4	0.8	
	Job location	4 Very Dissatisfied	2.0	0.2	0.8	0.3	*0.0561
		1 Very Satisfied	26.7	0.7	28.1	1.7	
		2 Somewhat Satisfied	43.1	0.8	41.5	1.7	
		3 Somewhat Dissatisfied	21.5	0.6	21.5	1.5	
	Opportunities for advancement	4 Very Dissatisfied	8.7	0.4	8.9	1.0	0.8188
		1 Very Satisfied	44.4	0.7	45.9	1.8	
		2 Somewhat Satisfied	39.2	0.7	38.9	1.8	
		3 Somewhat Dissatisfied	11.9	0.5	11.7	1.4	
	Intellectual challenge	4 Very Dissatisfied	4.5	0.3	3.5	0.6	0.6149
		1 Very Satisfied	49.7	0.7	51.3	1.9	
		2 Somewhat Satisfied	39.8	0.7	37.8	2.1	
		3 Somewhat Dissatisfied	8.1	0.4	8.7	1.1	
	Level of responsibility	4 Very Dissatisfied	2.4	0.2	2.2	0.5	0.7250
		1 Very Satisfied	62.5	0.7	62.8	1.8	
		2 Somewhat Satisfied	30.1	0.6	28.5	1.7	
		3 Somewhat Dissatisfied	5.4	0.3	6.6	1.0	
	Degree of independence	4 Very Dissatisfied	2.1	0.2	2.1	0.6	0.6436
	Contributions to society	1 Very Satisfied	50.9	0.6	56.2	1.9	*0.0312
			Grid		Item-by-item		
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			(Produ	ction)	(Bridge	Panel)	
Question (Census			_	Std.		Std.	Chi-square
question ID)	Item	Value	Percent	error	Percent	error	p-value
		2 Somewhat Satisfied	35.4	0.7	33.6	1.7	
		3 Somewhat Dissatisfied	9.9	0.4	7.3	1.2	
		4 Very Dissatisfied	3.7	0.3	2.9	0.6	
	To improve skills or knowledge in my current	Yes	56.5	1.0	63.4	2.5	
	occupational field	No	43.5	1.0	36.6	2.5	*0.0097
	To increase opportunities for promotion or	Yes	47.4	1.1	54.7	2.8	
On February 1, 2021,	field	No	52.6	1.1	45.3	2.8	*0.0141
	To facilitate a chance to a different	Yes	14.4	0.8	16.8	2.2	
why did you hold this	occupational field	No	85.6	0.8	83.2	2.2	0.2381
certification or license? (CLICINTRO)		Yes	72.9	0.9	73.8	2.4	
	Required or expected by employer	No	27.1	0.9	26.2	2.4	0.7311
		Yes	6.4	0.6	8.3	1.3	
	To start my own business	No	93.6	0.6	91.7	1.3	0.1219
		Yes	11.9	0.7	10.3	1.5	
	Other reason, specify	No	88.1	0.7	89.7	1.5	0.3723
	To improve skills or knowledge in my current	Yes	91.5	0.6	92.6	1.2	
	occupational field	No	8.5	0.6	7.4	1.2	0.3894
	To increase opportunities for promotion or	Yes	44.0	0.9	45.7	2.2	
	advancement in my current occupational field	No	56.0	0.9	54.3	2.2	0.4371
For which of the	For licensure or certification in my current	Yes	45.9	1.3	43.4	2.7	
following reasons did	occupational field	No	54.1	1.3	56.6	2.7	0.3940
you take work-related	To facilitate a change to a difference	Yes	9.6	0.6	9.9	1.3	
training during the	occupational field	No	90.4	0.6	90.1	1.3	0.8705
(WTRINTRO)		Yes	66.3	1.1	65.7	2.5	
(Required or expected by employer	No	33.7	1.1	34.3	2.5	0.8024
		Yes	31.8	0.9	35.8	2.4	
	For leisure or personal interest	No	68.2	0.9	64.2	2.4	0.1218
		Yes	0.7	0.2	1.4	0.7	
	Other reason, specify	No	99.3	0.2	98.6	0.7	0.1908

			Grid		Item-by (Bridge			
Ouestion (Census			(FIGUU	Std.	(Bridge	Std.	Chi-square	
question ID)	Item	Value	Percent	error	Percent	error	p-value	
		1 Very Important	69.8	0.6	64.8	1.5		
		2 Somewhat Important	27.4	0.6	32.1	1.4		
		3 Somewhat Unimportant	1.7	0.2	2.0	0.5		
	Salary	4 Not Important At All	1.1	0.1	1.2	0.3	*0.0163	
		1 Very Important	70.8	0.7	74.2	1.3		
		2 Somewhat Important	22.9	0.6	21.2	1.2		
		3 Somewhat Unimportant	3.8	0.3	2.7	0.5		
	Benefits	4 Not Important At All	2.4	0.2	1.9	0.4	*0.0759	
		1 Very Important	68.2	0.5	72.0	1.5		
		2 Somewhat Important	26.1	0.5	23.6	1.4		
		3 Somewhat Unimportant	3.6	0.2	2.2	0.4		
	Job security	4 Not Important At All	2.0	0.2	2.3	0.5	*0.0117	
		1 Very Important	64.2	0.6	63.0	1.5		
When thinking about a		2 Somewhat Important	31.4	0.6	33.1	1.4		
job, how important is		3 Somewhat Unimportant	3.2	0.2	2.5	0.5		
factors to you?	Job location	4 Not Important At All	1.2	0.2	1.4	0.4	0.5537	
(FACINTRO)		1 Very Important	44.8	0.6	48.2	1.5		
		2 Somewhat Important	41.0	0.6	40.1	1.7		
		3 Somewhat Unimportant	9.9	0.4	7.8	0.8		
,	Opportunities for advancement	4 Not Important At All	4.3	0.3	3.8	0.7	0.1295	
		1 Very Important	58.3	0.7	59.9	1.7		
		2 Somewhat Important	36.4	0.7	35.7	1.8		
		3 Somewhat Unimportant	4.3	0.3	3.0	0.6		
	Intellectual challenge	4 Not Important At All	1.0	0.1	1.5	0.4	0.2267	
		1 Very Important	43.8	0.6	43.8	1.7		
		2 Somewhat Important	47.7	0.6	48.7	1.7		
		3 Somewhat Unimportant	7.0	0.3	5.2	0.8		
	Level of responsibility	4 Not Important At All	1.6	0.2	2.4	0.5	*0.0785	
		1 Very Important	63.0	0.6	62.8	1.6		
	Degree of independence	2 Somewhat Important	33.6	0.6	34.2	1.5	0.2334	

			Grid		Grid Item-by-item		
Question (Consus			(Produ	ction)	(Bridge	Panel)	Chi-square
question ID)	Item	Value	Percent	error	Percent	error	p-value
		3 Somewhat Unimportant	2.6	0.2	1.8	0.3	
		4 Not Important At All	0.8	0.1	1.2	0.3	
		1 Very Important	52.8	0.6	57.0	1.6	
		2 Somewhat Important	37.3	0.6	35.3	1.4	
		3 Somewhat Unimportant	7.9	0.4	5.4	0.7	
	Contribution to society	4 Not Important At All	2.1	0.2	2.4	0.5	*0.0094
	Before graduating from high school or	Yes	17.9	0.8	17.7	1.9	
	earning a high school equivalency certificate	No	82.1	0.8	82.3	1.9	0.9547
	After high school and before ever enrolling	Yes	46.0	1.0	48.7	2.3	
During which of the	in a 4-year college or university	No	54.0	1.0	51.3	2.3	0.3065
following time periods	While enrolled in a 4-year college or	Yes	34.9	1.0	36.8	2.2	
did you take courses at a community college?	university and before receiving my first bachelor's degree	No	65.1	1.0	63.2	2.2	0.4398
(CSINTRO)	After leaving a 4-year college or university	Yes	9.6	0.7	10.6	1.4	
	without receiving my first bachelor's degree	No	90.4	0.7	89.4	1.4	0.5242
	Any time after receiving my first bachelor's degree	Yes	30.4	0.9	31.2	2.0	
		No	69.6	0.9	68.8	2.0	0.7551
	To earn college credits while still attending	Yes	15.9	0.7	17.1	1.8	
	high school	No	84.1	0.7	82.9	1.8	0.5299
		Yes	33.1	1.1	33.9	2.1	
	To complete an associate degree	No	66.9	1.1	66.1	2.1	0.7526
Thinking back to the	To prepare for college/increase change of	Yes	40.3	1.2	44.2	2.4	
time(s) you attended	acceptance to a 4-year college or university	No	59.7	1.2	55.8	2.4	0.1605
community college, for which of the following		Yes	64.5	0.9	65.1	2.2	
reasons did you take	To earn credits for a bachelor's degree	No	35.5	0.9	34.9	2.2	0.8047
community college	For financial reasons (e.g., cost of a 4-year	Yes	43.0	0.9	43.6	2.4	
courses? (CCINTRO)	school)	No	57.0	0.9	56.4	2.4	0.8091
	To gain further skills or knowledge in my	Yes	42.3	1.0	47.4	2.4	
	academic or occupational field	No	57.7	1.0	52.6	2.4	*0.0705
	To facilitate a chance in my academic or	Yes	22.7	0.9	25.4	1.7	-
	occupational field	No	77.3	0.9	74.6	1.7	0.1879

			Grid		Item-by		
			(Produ	ction)	(Bridge	Panel)	
Question (Census	_		_	Std.	_	Std.	Chi-square
question ID)	Item	Value	Percent	error	Percent	error	p-value
	To increase opportunities for promotion,	Yes	24.6	1.0	27.6	2.2	
	advancement, or higher salary	No	75.4	1.0	72.4	2.2	0.2347
		Yes	24.2	0.8	25.3	2.2	
	For leisure or personal interest	No	75.8	0.8	74.7	2.2	0.6621
		Yes	2.8	0.3	3.6	1.1	
	Other reason, specify	No	97.2	0.3	96.4	1.1	0.4437
	To gain further education before beginning a	Yes	61.5	2.2	67.3	6.0	
	career	No	38.5	2.2	32.7	6.0	0.3895
	To prepare for graduate school or further	Yes	31.7	2.8	38.8	7.9	
	education	No	68.3	2.8	61.2	7.9	0.4076
	To change my academic or occupational	Yes	38.9	2.9	44.2	6.9	
	field	No	61.1	2.9	55.8	6.9	0.4989
	To gain further skills or knowledge in my	Yes	74.3	2.3	71.5	6.8	
For which of the	academic or occupational field	No	25.7	2.3	28.5	6.8	0.6920
following reasons were	For licensure or certification	Yes	43.5	2.8	36.5	7.3	
you taking courses or		No	56.5	2.8	63.5	7.3	0.3755
enrolled? (ACINTRO)	To increase opportunities for promotion	Yes	71.8	2.6	76.7	6.1	
	advancement, or higher salary	No	28.2	2.6	23.3	6.1	0.4740
		Yes	17.2	2.3	9.7	3.9	
	Required or expected by employer	No	82.8	2.3	90.3	3.9	0.1435
		Yes	43.5	2.8	44.2	6.5	
	For leisure or personal interest	No	56.5	2.8	55.8	6.5	0.9200
		Yes	1.3	0.5	D	D	
	Some other reason, specify	No	98.7	0.5	D	D	0.6732
	Engineering, computer science, math or the	Yes	24.3	0.7	24.6	2.1	
Did your spouse's or partner's duties on his or her job require the	natural sciences	No	75.7	0.7	75.4	2.1	0.9124
		Yes	10.1	0.6	9.0	1.3	
technical expertise of a	The social sciences	No	89.9	0.6	91.0	1.3	0.4945
bachelor's degree or	Some other field (e.g., health, business, or	Yes	40.0	0.9	38.7	2.6	
higher in (SPINTRO)	education), specify	No	60.0	0.9	61.3	2.6	0.6466

			Grid		Item-by		
			(Produc	ction)	(Bridge Panel)		
Question (Census				Std.		Std.	Chi-square
question ID)	Item	Value	Percent	error	Percent	error	p-value
		Yes	44.8	2.2	51.9	4.2	
	Family-related reasons	No	55.2	2.2	48.1	4.2	0.1181
	Educational opportunities in the United States	Yes	45.3	2.0	46.2	4.2	
		No	54.7	2.0	53.8	4.2	0.8476
important in your		Yes	49.8	2.4	55.5	4.3	
decision to first come	Jobs or economic opportunities	No	50.2	2.4	44.5	4.3	0.2225
to the United States	Scientific or professional infrastructure in my	Yes	17.6	1.2	20.4	3.5	
for six months or longer? (CMINTRO)	field	No	82.4	1.2	79.6	3.5	0.4273
		Yes	13.8	1.6	17.7	3.3	
	It was not my decision	No	86.2	1.6	82.3	3.3	0.2378
		Yes	6.9	1.2	5.2	1.5	
	Some other reason, specify	No	93.1	1.2	94.8	1.5	0.4085

*Denotes statistical significance at alpha 0.10

Note: "D" represents a suppressed cell due to disclosure avoidance. Rao-Scott Chi-square test compared item nonresponse distributions for grid (production) and item-by-item (Bridge Panel)

SOGI

Table 22: Response distributions for SOGI

			Std.
Question	Value	Percent	error
Carr	Male	45.9	0.2
Sex (Production)	Female	54.1	0.2
(i roduction)	Total	100.0	-
	Male	46.1	0.6
Birth Sex	Female	53.9	0.6
(Bridge Panel)	Don't Know	0.1	<0.1
	Total	100.0	-
	Unchecked	55.3	0.7
	Male	44.7	0.7
	Total	100.0	-
	Unchecked	46.3	0.6
	Female	53.7	0.6
	Total	100.0	-
	Unchecked	99.7	0.3
	Transgender	0.3	0.3
	Total	100.0	-
	Unchecked	99.8	0.1
	Gender non-conforming	0.2	0.1
	Total	100.0	-
Current	Unchecked	99.7	0.2
Gender	Non-binary	0.3	0.2
(Bridge Panel)	Total	100.0	-
	Unchecked	99.8	0.1
	Genderfluid	0.2	0.1
	Total	100.0	-
	Unchecked	D	D
	Genderqueer	D	D
	Total	D	-
	Unchecked	99.7	0.2
	Other gender identity, specify	0.3	0.2
	Total	100.0	-
	Unchecked	98.8	0.3
	Prefer not to answer	1.2	0.3
	Total	100.0	-
	Unchecked	96.5	0.7
	Lesbian or Gay	3.5	0.7
Sexual	Total	100.0	-
Orientation	Unchecked	13.2	1.2
(Bridge Panel)	Straight, that is, not gay	86.8	1.2
	Total	100.0	-
	Unchecked	98.6	0.4

			Std.
Question	Value	Percent	error
	Bisexual	1.4	0.4
	Total	100.0	-
	Unchecked	99.9	<0.1
	Asexual	0.1	<0.1
	Total	100.0	-
	Unchecked	99.3	0.3
	Pansexual	0.7	0.3
	Total	100.0	-
	Unchecked	99.4	0.3
	Fluid	0.6	0.3
	Total	100.0	-
	Unchecked	99.1	0.4
	Queer	0.9	0.4
	Total	100.0	-
	Unchecked	99.6	0.2
	Other sexual orientation - specify	0.4	0.2
	Total	100.0	-
	Unchecked	92.6	0.8
	Prefer not to answer	7.4	0.8
	Total	100.0	-

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment Note: "D" represents a suppressed cell due to disclosure avoidance.

Coronavirus-related questions

Tahla	22.	Rosnonso	distributions	for	coronavirus	aupstions
Iable	Z .J.	Response	uistributions	101	coronavirus	questions

			Production		Bridge Panel		
Question (Census							Chi-square
question ID)	Item	Value	Percent	Std. error	Percent	Std. error	p-value
		Yes	54.9	1.1	61.6	3.2	
	Retired	No	45.1	1.1	38.4	3.2	*0.0586
		Yes	9.9	0.7	-	-	
	On layoff from a job due to the coronavirus pandemic	No	90.1	0.7	-	-	N/A
	On layoff from a job for reasons unrelated to the coronavirus	Yes	3.4	0.4	6.5	1.4	
	pandemic	No	96.6	0.4	93.5	1.4	*0.0071
		Yes	12.8	0.8	6.5	1.4	
During the week of February 1, 2021, what were your reasons for not working? (NWINTRO)	^On layoff from a job for any reason	No	87.2	0.8	93.5	1.4	*0.0007
		Yes	5.0	0.6	5.3	1.4	
	Student	No	95.0	0.6	94.7	1.4	0.8454
	Family responsibilities due to the coronavirus pandemic (e.g.,	Yes	6.6	0.7	-	-	
	childcare, eldercare)	No	93.4	0.7	-	-	N/A
		Yes	12.9	0.9	14.5	2.4	
	Family responsibilities unrelated to the coronavirus pandemic	No	87.1	0.9	85.5	2.4	0.4785
		Yes	17.1	1.1	14.5	2.4	
	^Family responsibilities	No	82.9	1.1	85.5	2.4	0.3050
		Yes	6.4	0.5	6.7	1.4	
	Chronic illness or permanent disability	No	93.6	0.5	93.3	1.4	0.8232
		Yes	11.2	0.9	10.9	1.9	
	Suitable job not available	No	88.8	0.9	89.1	1.9	0.8908
		Yes	18.2	0.9	24.3	3.1	
	Did not need or want to work	No	81.8	0.9	75.7	3.1	*0.0520
		Yes	6.3	0.6	10.8	2.2	
	Other reason, specify	No	93.7	0.6	89.2	2.2	*0.0216
		Yes	20.3	1.3	14.4	3.2	
	Previously retired or semi-retired	No	79.7	1.3	85.6	3.2	0.1249
		Yes	8.9	1.0	6.1	1.9	
Why did you usually	Student	No	91.1	1.0	93.9	1.9	0.2124
work fewer than 35	Family responsibilities due to the coronavirus pandemic (e.g.,	Yes	18.8	1.5	-	-	
hours?	childcare, eldercare)	No	81.2	1.5	_	-	N/A
(PJINTKO)		Yes	27.2	1.3	45.2	5.4	
	Family responsibilities unrelated to the coronavirus pandemic	No	72.8	1.3	54.8	5.4	*0.0002
	^Family responsibilities	Yes	34.6	1.5	45.2	5.4	*0.0428

			Production		Bridg		
Question (Census question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Chi-square p-value
,		No	65.4	1.5	54.8	5.4	
		Yes	12.9	1.3	-	-	
	Full-time job not available due to the coronavirus pandemic	No	87.1	1.3	-	-	N/A
	Full-time job not available unrelated to the coronavirus	Yes	12.7	1.2	23.3	3.9	
	pandemic	No	87.3	1.2	76.7	3.9	*0.0027
		Yes	22.8	1.6	23.3	3.9	
	^Full-time job not available	No	77.2	1.6	76.7	3.9	0.9033
		Yes	24.6	1.7	-	-	
	Hours or work reduced due to the coronavirus pandemic	No	75.4	1.7	-	-	N/A
		Yes	9.1	1.0	-	-	
	Hours or work reduced unrelated to the coronavirus pandemic	No	90.9	1.0	-	-	N/A
		Yes	13.5	1.2	17.6	4.2	
	Held more than one job	No	86.5	1.2	82.4	4.2	0.3124
		Yes	45.8	1.7	46.5	4.5	
	Did not need or want to work more hours	No	54.2	1.7	53.5	4.5	0.8847
		Yes	11.7	1.1	15.0	3.0	
	Other reason, specify	No	88.3	1.1	85.0	3.0	0.2429
	Health insurance that was at least partially paid by your	Yes	80.2	0.5	83.2	1.3	
	employer	No	19.8	0.5	16.8	1.3	*0.0489
Thinking of your	A pension plan or a retirement plant to which your employer	Yes	72.9	0.6	75.3	1.4	
principal job during	contributed	No	27.1	0.6	24.7	1.4	0.1140
the week of February		Yes	22.1	0.5	25.8	1.7	
1, 2021, which of the	A profit-sharing plan	No	77.9	0.5	74.2	1.7	*0.0345
were available to you		Yes	34.6	0.6	-	-	
even if you chose not	New or additional paid leave due to the coronavirus pandemic	No	65.4	0.6	-	-	N/A
to take them?	Paid vacation, sick or personal days unrelated to the	Yes	77.7	0.5	84.2	1.1	
(BFTINTRO)	coronavirus pandemic	No	22.3	0.5	15.8	1.1	*<.0001
		Yes	79.0	0.5	84.2	1.1	
	^Any paid leave	No	21.0	0.5	15.8	1.1	*<.0001
		Yes	58.0	1.4	63.3	4.6	
Why did you change	Pay, promotion opportunities	No	42.0	1.4	36.7	4.6	0.2911
your employer or	Working conditions (e.g., hours, equipment, working	Yes	45.5	1.8	51.4	4.1	
your job between the	environment)	No	54.5	1.8	48.6	4.1	0.2043
2019 and the week of		Yes	30.9	1.5	29.3	4.0	
February 1 20212	Job location	No	69.1	1.5	70.7	4.0	0.6984
(CHINTRO)		Yes	31.5	1.5	31.2	3.7	
()	Change in career or professional interests	No	68.5	1.5	68.8	3.7	0.9542

			Production		Bridg		
Question (Census							Chi-square
question ID)	Item	Value	Percent	Std. error	Percent	Std. error	p-value
	Family-related reasons due to the coronavirus pandemic (e.g.,	Yes	4.3	0.6	-	-	
	childcare, eldercare)	No	95.7	0.6	-	-	N/A
	Family-related reasons unrelated to the coronavirus pandemic	Yes	9.0	0.8	10.5	2.4	
	(e.g., children, spouse's job moved)	No	91.0	0.8	89.5	2.4	0.5460
		Yes	11.5	0.9	10.5	2.4	
	^Family related	No	88.5	0.9	89.5	2.4	0.6864
	School-related reasons (e.g., returned to school, completed a	Yes	9.7	0.9	10.0	2.0	
	degree)	No	90.3	0.9	90.0	2.0	0.8851
		Yes	10.1	1.0	-	-	
	Laid off or job terminated due to the coronavirus pandemic	No	89.9	1.0	-	-	N/A
	Laid off or job terminated for reasons other than the	Yes	12.0	1.0	24.5	3.6	
	coronavirus pandemic (includes company closings, mergers,						
	buyouts, grant or contract ended)	No	88.0	1.0	75.5	3.6	*<.0001
		Yes	20.3	1.3	24.5	3.6	
	^Laid off	No	79.7	1.3	75.5	3.6	0.2570
		Yes	2.5	0.4	5.1	1.8	
	Retired	No	97.5	0.4	94.9	1.8	*0.0360
		Yes	7.9	0.8	2.8	1.0	
	Some other reason, specify	No	92.1	0.8	97.2	1.0	*0.0023
During the past 12		Bridge					
months, did you attend	Production: Yes, I attended in person or virtually, i.e., online	Panel:					
any professional	or by remote access	Yes	23.9	0.5	20.3	1.3	
professional society or		Bridge					
association meetings?		Panel:					
(PROMTGI)	Production: No	No	76.1	0.5	79.7	1.3	*0.0124

*Denotes statistical significance at alpha 0.10

^Denotes a recoded item, which combines the response option that references the coronavirus pandemic and the matching response option that does not Note: Rao-Scott Chi-square test compared distributions for production and Bridge Panel

Survey item	, , ,	Mean	Std. error
By how much did your income for 202	20 decrease due to the pandemic? (ERNDEC)	22,670	1,076
By how much did your income for 202	20 increase due to the pandemic? (ERNINC)	24,050	3,951
By how much did your salary decrease	e due to the pandemic? (SALDEC)	18,210	1,052
By how much did your salary increase	due to the pandemic? (SALINC)	16,940	4,578
Survey item	Response option	Percent	Std. error
11	It increased	7.7	0.4
How was your total earned income	It decreased	26.7	0.6
for 2020 affected by the coronavirus	It was not affected	65.5	0.7
	Total	100.0	
For the principal job you held during	No	74.6	0.7
the week of February 1, 2021, has	Yes	25.4	0.7
your basic annual salary been			
affected at any time by the			
coronavirus pandemic? (SALCOV1)	Total	100.0	
Did the salary you provided reflect	No	51.3	1.3
the effects of the coronavirus	Yes	48.7	1.3
pandemic? (SALEFF)	Total	100.0	
	It was decreased temporarily but has returned to		
	normal	44.6	1.3
	It is currently decreased	29.1	1.2
How has your basic appual salary	It was increased temporarily but has returned to		
heen affected by the coronavirus	normal	3.6	0.5
nandemic? (SALCOV2)	It is currently increased	4.6	0.7
	I did not receive an expected raise or cost of living		
	increase	14.5	0.9
	Other, specify	3.6	0.5
	Total	100.0	
Thinking of your principal job during	I was allowed or required to telecommute/work		
the week of February 1, 2021, which	remotely due to the coronavirus pandemic	53.4	0.6
of the following best describes	I was allowed or required to telecommute/work		
whether you were allowed or	14.6	0.4	

Table 24: Response distributions for coronavirus salary and telework questions

required to telecommute/work remotely? (TELEW)	I was not allowed or required to telecommute/work remotely	9.6	0.4
	Telecommuting/working remotely did not make		
	sense for my job	22.4	0.6
	Total	100.0	

Coronavirus-related questions by mode (new and old cohort)

Table 25: New cohort mean and median salary and income increase or decrease by mode of response

Survey Item		CATI	Paper	Web	p-value
					0.1492 (CATI/Paper)
As of the week of February 1, 2021,	Mean	77,320	85,450	92,360	*0.0002 (CATI/Web)
what was your basic annual salary on	(Std. error)	(3,376)	(4,830)	(1,275)	0.1661 (Paper/Web)
(SALARY)	Median	64,560	64,990	72,920	
	(Std. error)	(3,203)	(2,716)	(1,251)	N/A
					*0.0349 (CATI/Paper)
Counting all jobs held in 2020, what	Mean	74,740	88,530	97,910	*<.0001 (CATI/Web)
was your total earned income for	(Std. error)	(4,002)	(5,129)	(2,080)	*0.0981 (Paper/Web)
2020, before deductions? (EARN)	Median	57,990	64,980	69,990	
	(Std. error)	(2,408)	(3,072)	(681.70)	N/A
					0.3068 (CATI/Paper)
By how much did your income for	Mean	22,320	49,000	22,420	0.9722 (CATI/Web)
By how much did your income for 2020 decrease due to the pandemic? (ERNDEC)	(Std. error)	(2,837)	(25,830)	(1,035)	0.3084 (Paper/Web)
(ERNDEC)	Median	9,859	9,902	9,973	
	(Std. error)	(1,530)	(2,957)	(802.80)	N/A
					0.7671 (CATI/Paper)
By how much did your income for	Mean	12,950	14,090	23,130	*0.0223 (CATI/Web)
2020 increase due to the pandemic?	(Std. error)	(2,491)	(3,074)	(3,492)	*0.0526 (Paper/Web)
(ERNINC)	Median	9,875	5,889	7,634	
	(Std. error)	(1,909)	(2,157)	(871.60)	N/A
					0.6203 (CATI/Paper)
due to the pandemic? (SALDEC)	Mean	23,690	29,400	18,020	0.1467 (CATI/Web)
	(Std. error)	(3,664)	11,150	(1,020)	0.3136 (Paper/Web)

Survey Item		CATI	Paper	Web	p-value
	Median	9,964	9,838	9,472	
	(Std. error)	(4,788)	(1,142)	(909.00)	N/A
					*0.0226 (CATI/Paper)
	Mean	18,470	6,588	16,890	0.8041 (CATI/Web)
By now much did your salary increase	(Std. error)	(4,747)	(2 <i>,</i> 058)	(4,524)	*0.0407 (Paper/Web)
	Median	9,758	2,828	4,848	
	(Std. error)	(5,154)	(1 <i>,</i> 055)	(687.20)	N/A

*Denotes statistical significance at alpha 0.10

Note: T-test compared means across respective response modes

Table 26, Old sahart maan	and madian calar	vand incomo incroacy	or doorooco b	made of records
Table 26: Old conort mean	i and median salar	y and income increase	e or decrease b	y mode of response

Survey Item		CATI	Paper	Web	p-values
					*0.0693 (CATI/Paper)
As of the week of February 1, 2021,	Mean	88,180	79,760	92,260	0.3359 (CATI/Web)
what was your basic annual salary on	(Std. error)	(4,114)	(1,955)	(860.10)	*<.0001 (Paper/Web)
(SALARY)	Median	69,250	63,380	75,000	
	(Std. error)	(2,741)	(2,074)	(1,120)	N/A
					0.3660 (CATI/Paper)
Counting all jobs held in 2020, what	Mean	103,100	89,610	98,310	0.7499 (CATI/Web)
was your total earned income for	(Std. error)	(14,900)	(3,665)	(1,187)	*0.0261 (Paper/Web)
2020, before deductions? (EARN)	Median	69,510	59,980	69 <i>,</i> 990	
	(Std. error)	(2,387)	(2,629)	(596.40)	N/A
					*0.0574 (CATI/Paper)
By how much did your income for	Mean	27,890	55,620	25,630	0.5639 (CATI/Web)
2020 decrease due to the pandemic?	(Std. error)	(3,737)	(14,200)	(1,192)	*0.0368 (Paper/Web)
(ERNDEC)	Median	13,800	11,830	9,988	
	(Std. error)	(2,104)	(1,758)	(489.70)	N/A
					0.6966 (CATI/Paper)
By how much did your income for	Mean	23,280	19,350	24,180	0.9106 (CATI/Web)
2020 increase due to the pandemic?	(Std. error)	(7,828)	(6,580)	(2,841)	0.5040 (Paper/Web)
(ERNINC)	Median	3,929	4,187	5,867	
	(Std. error)	(3,169)	(858.60)	(690.30)	N/A

Survey Item		CATI	Paper	Web	p-values
					*0.0001 (CATI/Paper)
	Mean	21,410	147,900	18,950	0.3603 (CATI/Web)
By now much did your salary decrease	(Std. error)	(2,575)	(32,750)	(669.80)	*0.0001 (Paper/Web)
	Median	9,940	9,961	9,911	
	(Std. error)	(2,318)	(1,218)	(466.60)	N/A
					0.1225 (CATI/Paper)
	Mean	3,970	6,130	15,540	*<.0001 (CATI/Web)
By now much did your salary increase	(Std. error)	(656.50)	(1,222)	(2,110)	*0.0001 (Paper/Web)
due to the pandemic! (SALINC)	Median	1,916	3,788	3,990	
	(Std. error)	(1,084)	(2,168)	(833.20)	N/A

*Denotes statistical significance at alpha 0.10

Note: T-test compared means across respective response modes

Table 27: New cohort response distributions of coronavirus questions by mode of response

			C	ΑΤΙ	Pa	aper	v	Veb	
Question (Census question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	Chi-square p-value
		Yes	60.3	4.0	75.5	2.8	54.0	1.1	
	Retired	No	39.7	4.0	24.5	2.8	46.0	1.1	
		Total	100.0		100.0		100.0		*<.0001
	On layoff from a job due to the coronavirus pandemic	Yes	15.8	3.0	4.2	1.3	10.0	0.7	
During the week of		No	84.2	3.0	95.8	1.3	90.0	0.7	
February 1. 2021.		Total	100.0		100.0		100.0		*0.0008
what were your	On loveff from a job for reasons	Yes	10.4	2.6	2.4	1.0	3.4	0.4	
reasons for not	unrelated to the coronavirus	No	89.6	2.6	97.6	1.0	96.6	0.4	
Working?	pandemic	Total	100.0		100.0		100.0		*<.0001
		Yes	7.5	2.0	3.1	1.1	5.5	0.5	
		No	92.5	2.0	96.9	1.1	94.5	0.5	
	Student	Total	100.0		100.0		100.0		0.1265
	Family responsibilities unrelated	Yes	13.3	2.7	9.6	1.9	12.8	0.9	
	to the coronavirus pandemic	No	86.7	2.7	90.4	1.9	87.2	0.9	0.3613

			C	ΑΤΙ	Pa	aper	V	Veb	
Question (Census									Chi-square
question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	p-value
		Total	100.0		100.0		100.0		
	Family responsibilities due to	Yes	10.7	2.3	2.2	1.0	6.6	0.7	
	the coronavirus pandemic (e.g.,	No	89.3	2.3	97.8	1.0	93.4	0.7	
	childcare, eldercare)	Total	100.0		100.0		100.0		*0.0031
		Yes	18.8	3.0	9.7	1.9	6.3	0.5	
	Chronic illness or permanent	No	81.2	3.0	90.3	1.9	93.7	0.5	
	disability	Total	100.0		100.0		100.0		*<.0001
		Yes	17.9	3.3	7.5	1.7	11.3	0.8	
		No	82.1	3.3	92.5	1.7	88.7	0.8	
	Suitable job not available	Total	100.0		100.0		100.0		*0.0096
		Yes	39.3	3.5	21.7	3.4	18.0	0.9	
		No	60.7	3.5	78.3	3.4	82.0	0.9	
	Did not need or want to work	Total	100.0		100.0		100.0		*<.0001
		Yes	4.8	1.5	3.1	1.4	6.7	0.6	
		No	95.2	1.5	96.9	1.4	93.3	0.6	
	Other reason, specify	Total	100.0		100.0		100.0		0.1241
		Yes	15.9	7.0	30.2	4.8	19.6	1.2	
	Previously retired or semi-	No	84.1	7.0	69.8	4.8	80.4	1.2	
	retired	Total	100.0		100.0		100.0		*0.0602
		Yes	18.2	5.8	4.5	2.0	10.6	1.0	
		No	81.8	5.8	95.5	2.0	89.4	1.0	
	Student	Total	100.0		100.0		100.0		*0.0297
Why did you usually	Family responsibilities due to	Yes	14.6	5.3	13.5	3.5	18.8	1.4	
work fewer than 35	the coronavirus pandemic (e.g.,	No	85.4	5.3	86.5	3.5	81.2	1.4	
(PJINTRO)	childcare, eldercare)	Total	100.0		100.0		100.0		0.3468
		Yes	29.8	9.0	19.3	4.2	26.8	1.3	
	Family responsibilities unrelated	No	70.2	9.0	80.7	4.2	73.2	1.3	
	to the coronavirus pandemic	Total	100.0		100.0		100.0		0.3206
		Yes	13.7	5.3	4.7	1.9	12.8	1.2	
	Full-time job not available due	No	86.3	5.3	95.3	1.9	87.2	1.2	
	to the coronavirus pandemic	Total	100.0		100.0		100.0		*0.0424

			C	ATI	Pa	aper	v	Veb	
Question (Census									Chi-square
question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	p-value
	Full-time job not available	Yes	30.1	10.2	13.2	3.2	13.1	1.1	
	unrelated to the coronavirus	No	69.9	10.2	86.8	3.2	86.9	1.1	
	pandemic	Total	100.0		100.0		100.0		*0.0290
		Yes	23.8	6.8	12.9	3.4	24.3	1.6	
Hours or work reduced due to	No	76.2	6.8	87.1	3.4	75.7	1.6		
	the coronavirus pandemic	Total	100.0		100.0		100.0		*0.0417
	Hours or work reduced	Yes	13.4	5.6	55.2	5.3	9.2	1.0	
	unrelated to the coronavirus	No	86.6	5.6	44.8	5.3	90.8	1.0	
	pandemic	Total	100.0		100.0		100.0		*<.0001
		Yes	31.8	7.6	15.9	4.6	13.2	1.1	
	Held more than one job	No	68.2	7.6	84.1	4.6	86.8	1.1	
		Total	100.0		100.0		100.0		*0.0126
		Yes	47.4	6.5	6.5	2.3	44.8	1.7	
	Did not need or want to work more hours	No	52.6	6.5	93.5	2.3	55.2	1.7	
		Total	100.0		100.0		100.0		*<.0001
		Yes	22.4	6.6	24.2	5.2	11.6	1.1	
	Other reason, specify	No	77.6	6.6	75.8	5.2	88.4	1.1	
		Total	100.0		100.0		100.0		*0.0013
		Yes	79.7	1.9	79.7	1.7	80.5	0.5	
	Health insurance that was at	No	20.3	1.9	20.3	1.7	19.5	0.5	
Thinking of your	employer	Total	100.0		100.0		100.0		0.8399
principal job during		Yes	67.8	2.5	71.8	2.1	72.9	0.6	
the week of	A pension plan or a retirement	No	32.2	2.5	28.2	2.1	27.1	0.6	
February 1, 2021, which of the	contributed	Total	100.0		100.0		100.0		*0.1150
which of the continue following benefits		Yes	22.2	2.2	20.2	2	22.1	0.5	
were available to		No	77.8	2.2	79.8	2	77.9	0.5	
you, even if you	A profit-sharing plan	Total	100.0		100.0		100.0	5.5	0.6588
chose not to take		Yes	31.3	2.8	33.9	23	34.6	0.5	0.0000
(BFTINTRO)	New or additional paid leave	No	68.7	2.8	66 1	2.3	65.4	0.5	
/	aue to the coronavirus	Total	100.0	2.0	100.0	2.5	100.0	0.5	0 501/
		Yes	73.1	2	74.3	2.1	77.8	0.5	*0.0339

			C	CATI		Paper		Web	
Question (Census									Chi-square
question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	p-value
	Paid vacation, sick or personal	No	26.9	2	25.7	2.1	22.2	0.5	
	coronavirus pandemic	Total	100.0		100.0		100.0		
		Yes	60.1	5.5	54.1	5.6	58.7	1.2	
		No	39.9	5.5	45.9	5.6	41.3	1.2	
	Pay, promotion opportunities	Total	100.0		100.0		100.0		0.6713
	Monting anditions (a.g. hours	Yes	40.3	5.3	47.6	4.8	45.5	1.6	
	equipment, working	No	59.7	5.3	52.4	4.8	54.5	1.6	
	environment)	Total	100.0		100.0		100.0		0.5738
	Job location	Yes	28.1	4.9	38.8	5.9	31.0	1.4	
		No	71.9	4.9	61.2	5.9	69.0	1.4	
		Total	100.0		100.0		100.0		0.2554
	Change in career or professional interests	Yes	44.4	4.8	32.4	5.3	32.3	1.3	
		No	55.6	4.8	67.6	5.3	67.7	1.3	
Why did you change		Total	100.0		100.0		100.0		0.1034
your employer or	Family-related reasons due to the coronavirus pandemic (e.g., childcare, eldercare)	Yes	9.9	3.9	2.0	1.0	4.3	0.6	
your job between		No	90.1	3.9	98.0	1.0	95.7	0.6	
the week of		Total	100.0		100.0		100.0		*0.0135
the week of	Family-related reasons	Yes	20.9	4.7	10.1	3.0	9.0	0.7	
February 1, 2021?	unrelated to the coronavirus	No	79.1	4.7	89.9	3.0	91.0	0.7	
(CHINTRO)	spouse's job moved)	Total	100.0		100.0		100.0		*0.0027
	School related reasons (a.g.	Yes	19.7	4.7	15.6	4.8	10.1	0.8	
	returned to school, completed a	No	80.3	4.7	84.4	4.8	89.9	0.8	
	degree)	Total	100.0		100.0		100.0		*0.0276
		Yes	9.9	2.7	3.4	1.7	9.9	0.9	
	Laid off or job terminated due to	No	90.1	2.7	96.6	1.7	90.1	0.9	
	the coronavirus pandemic	Total	100.0		100.0		100.0		*0.0526
	Laid off or job terminated for	Yes	12.1	2.6	12.4	3.7	11.8	0.9	
	reasons other than the	No	87.9	2.6	87.6	3.7	88.2	0.9	
	coronavirus pandemic (includes company closings, mergers, buyouts, grant or contract								
	ended)	Total	100.0		100.0		100.0		0.9785

			C	CATI	Pa	aper	v	Veb	
Question (Census question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	Chi-square p-value
		Yes	8.6	3.5	3.3	1.6	2.4	0.4	
		No	91.4	3.5	96.7	1.6	97.6	0.4	
	Retired	Total	100.0		100.0		100.0		*0.0079
		Yes	3.7	1.3	6.1	2.6	7.5	0.7	
		No	96.3	1.3	93.9	2.6	92.5	0.7	
	Some other reason, specify	Total	100.0		100.0		100.0		0.2902
During the past 12	Production: Yes, I attended in								
months, did you	person or virtually, i.e., online or	Bridge							
attend any	by remote access	Panel: Yes	20.8	2.0	19.3	1.2	24.2	0.4	
professional		Bridge							
conferences or	Production: No	Panel: No	79.2	2.0	80.7	1.2	75.8	0.4	
professional society									
or association									
meetings?									
(PROMTGI)		Total	100.0		100.0		100.0		*0.0024

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared distributions across mode of response

Table 28: Old cohort response distributions of coronavirus questions by mode of response

			C	ATI	Pa	aper	V	Veb	
Question (Census									Chi-square
question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	p-value
		Yes	59.8	3.8	76.3	2.1	58.5	1.0	
		No	40.2	3.8	23.7	2.1	41.5	1.0	
	Retired	Total	100.0		100.0		100.0		*<.0001
	On layoff from a job due to the coronavirus pandemic	Yes	11.8	2.3	6.1	1.4	9.1	0.6	
During the week of		No	88.2	2.3	93.9	1.4	90.9	0.6	
February 1, 2021,		Total	100.0		100.0		100.0		*0.0973
what were your	On layoff from a job for reasons	Yes	6.3	1.7	2.9	0.7	4.3	0.4	
reasons for not	unrelated to the coronavirus	No	93.7	1.7	97.1	0.7	95.7	0.4	
working?	pandemic	Total	100.0		100.0		100.0		0.1070
(NWINTRO)		Yes	2.9	0.8	1.6	0.5	3.0	0.4	
		No	97.1	0.8	98.4	0.5	97.0	0.4	
	Student	Total	100.0		100.0		100.0		*0.0984
	Family responsibilities unrelated	Yes	25.9	3.6	9.6	1.5	13.0	0.7	
	to the coronavirus pandemic	No	74.1	3.6	90.4	1.5	87.0	0.7	*<.0001

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			C	CATI	Pa	aper	V	Veb	
Question (Census									Chi-square
question ID)	Item	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	p-value
		Total	100.0		100.0		100.0		
	Family responsibilities due to	Yes	9.7	2.4	3.5	0.8	7.4	0.6	
	the coronavirus pandemic (e.g.,	No	90.3	2.4	96.5	0.8	92.6	0.6	
	childcare, eldercare)	Total	100.0		100.0		100.0		*0.0038
		Yes	19.8	3.3	7.2	1.2	6.3	0.5	
	Chronic illness or permanent	No	80.2	3.3	92.8	1.2	93.7	0.5	
	disability	Total	100.0		100.0		100.0		*<.0001
		Yes	19.4	3.1	5.1	1.5	9.8	0.7	
		No	80.6	3.1	94.9	1.5	90.2	0.7	
	Suitable job not available	Total	100.0		100.0		100.0		*<.0001
		Yes	47.5	4.0	21.2	1.9	19.6	0.8	
		No	52.5	4.0	78.8	1.9	80.4	0.8	
	Did not need or want to work	Total	100.0		100.0		100.0		*<.0001
		Yes	1.7	0.9	3.0	0.8	6.1	0.5	
		No	98.3	0.9	97.0	0.8	93.9	0.5	
	Other reason, specify	Total	100.0		100.0		100.0		*0.0016
		Yes	21.4	4.6	30.9	3.0	27.0	1.2	
	Previously retired or semi-	No	78.6	4.6	69.1	3.0	73.0	1.2	
	retired	Total	100.0		100.0		100.0		0.2168
		Yes	15.5	5.7	2.7	0.8	6.6	0.6	
		No	84.5	5.7	97.3	0.8	93.4	0.6	
	Student	Total	100.0		100.0		100.0		*0.0013
	Family responsibilities due to	Yes	14.5	4.8	13.7	2.2	17.5	1.1	
	the coronavirus pandemic (e.g.,	No	85.5	4.8	86.3	2.2	82.5	1.1	
	childcare, eldercare)	Total	100.0		100.0		100.0		0.3857
Why did you		Yes	31.2	7.0	24.2	3.0	28.2	1.2	
usually work fewer	Family responsibilities unrelated	No	68.8	7.0	75.8	3.0	71.8	1.2	
than 35 hours?	to the coronavirus pandemic	Total	100.0		100.0		100.0		0.4972
(PJINTRO)		Yes	24.1	5.9	5.7	1.7	9.8	0.9	
	Full-time job not available due	No	75.9	5.9	94.3	1.7	90.2	0.9	
	to the coronavirus pandemic	Total	100.0		100.0		100.0		*0.0003
	Full-time job not available	Yes	14.3	5.3	7.9	1.5	13.6	1.0	
	unrelated to the coronavirus	No	85.7	5.3	92.1	1.5	86.4	1.0	
	pandemic	Total	100.0		100.0		100.0		*0.0713
		Yes	34.1	6.7	10.4	1.9	21.3	1.3	
	Hours or work reduced due to	No	65.9	6.7	89.6	1.9	78.7	1.3	
	the coronavirus pandemic	Total	100.0		100.0		100.0		*<.0001
		Yes	25.3	6.6	52.2	3.8	9.0	0.8	*<.0001

			C	ATI	P	aper	V	Veb	
Question (Census									Chi-square
question ID)	ltem	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	p-value
	Hours or work reduced	No	74.7	6.6	47.8	3.8	91.0	0.8	
	unrelated to the coronavirus								
	pandemic	Total	100.0		100.0		100.0		
		Yes	11.6	4.6	16.1	2.5	11.3	0.9	
		No	88.4	4.6	83.9	2.5	88.7	0.9	
	Held more than one job	Total	100.0		100.0		100.0		0.1685
		Yes	43.3	6.9	5.1	1.3	52.5	1.4	
	Did not need or want to work	No	56.7	6.9	94.9	1.3	47.5	1.4	
	more hours	Total	100.0		100.0		100.0		*<.0001
		Yes	10.7	4.3	18.5	2.6	12.1	1.1	
		No	89.3	4.3	81.5	2.6	87.9	1.1	
	Other reason, specify	Total	100.0		100.0		100.0		*0.0383
	Health insurance that was at	Yes	78.7	2.3	75.9	1.4	81.3	0.4	
	least partially paid by your	No	21.3	2.3	24.1	1.4	18.7	0.4	
Thinking of your	employer	Total	100.0		100.0		100.0		*0.0008
principal job during	A pension plan or a retirement	Yes	69.7	2.4	69.2	1.5	73.6	0.5	
the week of	plant to which your employer	No	30.3	2.4	30.8	1.5	26.4	0.5	
February 1, 2021,	contributed	Total	100.0		100.0		100.0		*0.0067
which of the		Yes	23.7	2.1	18.1	1.3	21.1	0.4	
following benefits		No	76.3	2.1	81.9	1.3	78.9	0.4	
were available to	A profit-sharing plan	Total	100.0		100.0		100.0		*0.0407
you, even if you	New or additional paid leave	Yes	31.0	2.7	32.1	1.6	35.3	0.5	
chose not to take	due to the coronavirus	No	69.0	2.7	67.9	1.6	64.7	0.5	
them?	pandemic	Total	100.0		100.0		100.0		*0.0659
(BFTINTRO)	Paid vacation, sick or personal	Yes	77.1	2.1	71.9	1.5	78.0	0.4	
	days unrelated to the	No	22.9	2.1	28.1	1.5	22.0	0.4	
	coronavirus pandemic	Total	100.0		100.0		100		*0.0003
		Yes	53.9	7.2	50.0	4.3	60.8	1.0	
Why did you		No	46.1	7.2	50.0	4.3	39.2	1.0	
change your	Pay, promotion opportunities	Total	100.0		100.0		100.0		*0.0502
employer or your	Working conditions (e.g., hours,	Yes	41.0	7.5	35.6	4.1	43.9	1.2	
job between the	equipment, working	No	59.0	7.5	64.4	4.1	56.1	1.2	
week of February 1,	environment)	Total	100.0		100.0		100.0		0.2430
2019 and the week		Yes	41.3	7.1	23.3	3.1	29.7	1.0	
of February 1,		No	58.7	7.1	76.7	3.1	70.3	1.0	
2021?	Job location	Total	100.0		100.0		100.0		*0.0306
(CHINTRO)	Change in career or professional	Yes	34.7	5.7	26.5	3.3	34.0	1.0	
	interests	No	65.3	5.7	73.5	3.3	66.0	1.0	0.1594

			0	CATI	Pa	aper	V	Veb	
Question (Census									Chi-square
question ID)	ltem	Value	Percent	Std. error	Percent	Std. error	Percent	Std. error	p-value
		Total	100.0		100.0		100.0		
	Family-related reasons due to	Yes	18.5	6.9	4.3	1.3	4.7	0.4	
	the coronavirus pandemic (e.g.,	No	81.5	6.9	95.7	1.3	95.3	0.4	
	childcare, eldercare)	Total	100.0		100.0		100.0		*<.0001
	Family-related reasons	Yes	20.4	6	10.1	2.5	9.2	0.6	
	unrelated to the coronavirus	No	79.6	6	89.9	2.5	90.8	0.6	
	pandemic (e.g., children,								
	spouse's job moved)	Total	100.0		100.0		100.0		*0.0153
	School-related reasons (e.g.,	Yes	13.5	3.7	2.8	0.8	6.7	0.6	
	returned to school, completed a	No	86.5	3.7	97.2	0.8	93.3	0.6	
	degree)	Total	100.0		100.0		100.0		*0.0011
		Yes	11.4	4.3	11.5	2.6	9.2	0.6	
	Laid off or job terminated due to	No	88.6	4.3	88.5	2.6	90.8	0.6	
	the coronavirus pandemic	Total	100.0		100.0		100.0		0.6006
	Laid off or job terminated for	Yes	14.3	3.4	8.8	2	12.1	0.8	
	reasons other than the	No	85.7	3.4	91.2	2	87.9	0.8	
	coronavirus pandemic (includes								
	company closings, mergers,								
	buyouts, grant or contract								
	ended)	Total	100.0		100.0		100.0		0.3085
		Yes	5.4	2.2	7.6	2.3	2.8	0.3	
		No	94.6	2.2	92.4	2.3	97.2	0.3	
	Retired	Total	100.0		100.0		100.0		*0.0024
		Yes	6.8	2.8	13.1	2.6	6.6	0.6	
		No	93.2	2.8	86.9	2.6	93.4	0.6	
	Some other reason, specify	Total	100.0		100.0		100.0		*0.0076
During the past 12	Production: Yes, I attended in								
months, did you	person or virtually, i.e., online or	Bridge							
attend any	by remote access	Panel: Yes	18.1	1.5	18.7	0.9	24.1	0.4	
professional		Bridge							
conferences or	Production: No	Panel: No	81.9	1.5	81.3	0.9	75.9	0.4	
professional society]
or association									
meetings?									
(PROMTGI)		Total	100.0		100.0		100.0		*<.0001

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared distributions across mode of response

Table 29: New cohort response	distributions for coronav	rirus affected salary ar	nd telework questions v	vith standard errors	by mode of	response
					,	

		CA	ΓΙ	Pape	er	Wel	b	ļ
			Std.		Std.		Std.	Chi-square
Survey item	Response option	Percent	error	Percent	error	Percent	error	p-value
How was your total earned	It increased	5.5	0.9	6.2	0.9	7.7	0.3	
income for 2020 affected by the	It decreased	32.8	2.6	20.4	1.7	26.4	0.6	
coronavirus pandemic?	It was not affected	61.6	2.8	73.4	1.9	65.9	0.7	
(ERNCOV1)	Total	100.0		100.0				*<.0001
For the principal job you held	No	71.9	2.6	79.8	1.6	75.0	0.7	
during the week of February 1,	Yes	28.1	2.6	20.2	1.6	25.0	0.7	
salary been affected at any time by the coronavirus pandemic?								
(SALCOV1)	Total	100.0		100.0		100.0		*0.0210
Did the salary you provided	No	33.1	4.8	51.9	4.9	51.4	1.2	
reflect the effects of the	Yes	66.9	4.8	48.1	4.9	48.6	1.2	
coronavirus pandemic? (SALEFF)	Total	100.0		100.0		100.0		*0.0016
	It was decreased temporarily but							
	has returned to normal	49.3	5.7	58.1	5.4	44.3	1.2	
	It is currently decreased	25.4	3.4	20.0	4.4	28.8	1.1	
How bas your basis appual salary	It was increased temporarily but							
heen affected by the coronavirus	has returned to normal	3.9	1.9	8.7	3.0	3.7	0.5	
pandemic? (SALCOV2)	It is currently increased	9.1	2.8	5.8	2.4	4.5	0.6	
	I did not receive an expected raise	10.2	25	6.0	2.0	15.0	0.0	
	or cost of living increase	10.2	2.5	6.9	2.6	15.0	0.8	
	Other, specify	2.1	1.2	0.5	0.3	3.6	0.5	
	Total	100.0		100.0	-	100.0		*0.0008
	I was allowed or required to							
Thinking of your principal job	to the coronavirus nandemic	46.8	2.6	45 A	2.1	54 1	0.6	
during the week of February 1	L was allowed or required to	+0.0	2.0	+J.+	2.1	54.1	0.0	
2021, which of the following best	telecommute/work remotely							
describes whether you were	regardless of the coronavirus							
allowed or required to	pandemic	15.7	1.9	11.1	1.4	14.4	0.4	
telecommute/work remotely?	I was not allowed or required to							
(TELEW)	telecommute/work remotely	12.1	1.7	13.2	1.7	9.5	0.3	
	Telecommuting/working remotely	25.4	2.4	20.2	1.0	22.0	0.0	* - 0004
	ald not make sense for my job	25.4	2.4	30.3	1.8	22.0	0.6	*<.0001

		CATI		Paper		Web		
			Std.		Std.		Std.	Chi-square
Survey item	Response option	Percent	error	Percent	error	Percent	error	p-value
	Total	100.0		100.0		100.0		

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared distributions across mode of response

Table 30: Old cohort response distributions for coronavirus affected salary and telework questions by mode of response

		CAT	1	Раре	er	We	b	
			Std.		Std.		Std.	Chi-square
Survey item	Response option	Percent	error	Percent	error	Percent	error	p-value
How was your total earned	It increased	7.2	1.3	7.5	0.9	7.6	0.3	
income for 2020 affected by the	It decreased	30.2	2.4	25.7	1.4	26.3	0.5	
coronavirus pandemic?	It was not affected	62.6	2.4	66.8	1.6	66.2	0.5	
(ERNCOV1)	Total	100.0		100.0		100.0		0.4894
For the principal job you held	No	73.5	2.3	77.3	1.3	75.8	0.5	
during the week of February 1,	Yes	26.5	2.3	22.7	1.3	24.2	0.5	
salary been affected at any time								
by the coronavirus pandemic?								
(SALCOV1)	Total	100.0		100.0		100.0		0.3142
Did the salary you provided	No	24.8	4.3	41.6	3.1	49.2	1.0	
reflect the effects of the	Yes	75.2	4.3	58.4	3.1	50.8	1.0	
coronavirus pandemic? (SALEFF)	Total	100.0		100.0		100.0		*<.0001
	It was decreased temporarily but							
	has returned to normal	44.2	5.5	53.9	3.2	45.8	1.0	
	It is currently decreased	34.1	4.9	26.1	2.8	25.5	0.9	
	It was increased temporarily but							
How has your basic annual salary	has returned to normal	7.5	3.5	5.7	1.8	3.7	0.4	
been affected by the coronavirus	It is currently increased	6.8	2.0	4.6	1.3	5.1	0.5	
partuerine (SALCOVZ)	I did not receive an expected raise							
	or cost of living increase	6.0	1.5	7.1	1.2	15.5	0.7	
	Other, specify	1.4	0.7	2.5	1.0	4.5	0.6	
	Total	100.0		100.0		100.0		*0.0002
Thinking of your principal job	I was allowed or required to							
during the week of February 1,	telecommute/work remotely due to							
2021, which of the following best	the coronavirus pandemic	53.3	2.6	44.1	1.6	54.7	0.5	*<.0001

		CAT	1	Раре	er	We	b	
			Std.		Std.		Std.	Chi-square
Survey item	Response option	Percent	error	Percent	error	Percent	error	p-value
describes whether you were	I was allowed or required to							
allowed or required to	telecommute/work remotely							
telecommute/work remotely?	regardless of the coronavirus							
(TELEW)	pandemic	14.5	1.6	12.1	1.1	14.4	0.4	
	I was not allowed or required to							
	telecommute/work remotely	9.7	1.4	11.6	1.3	10.1	0.3	
	Telecommuting/working remotely							
	did not make sense for my job	22.6	2.2	32.2	1.6	20.8	0.4	
	Total	100.0		100.0		100.0		

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared distributions across mode of response

Table 31 to Table 34 provide paradata estimates from the grid and item-by-item analysis.

Table 31: Breakoff rates as a percent of respondent visits for the grid and item-by-item questions

	G	Grid	Item-b	Item-by-item	
	(Prod	luction)	(Bridge	e Panel)	Chi-square
Screen (Census question ID)	Estimate	Std. error	Estimate	Std. error	p-value
Did your duties on this job require the technical expertise of a bachelor's degree or higher in					
(MGINTRO)	0.1	<0.1	0.5	0.3	*0.0019
Did any of the following factors influence your decision to work in an area outside the field of your					
highest degree? (NRINTRO)	<0.1	<0.1	0.0	N/A	N/A
The next question is about your work activities on your principal job. Which of the following work					
activities occupied at least 10 percent of your time during a typical work week on this job? (WAINTRO)	0.5	0.1	0.9	0.4	0.2507
Thinking about the principal job you held during the week of February 1, 2021, how satisfied or					
dissatisfied were you with the following aspects of the job? (SATINTRO)	0.2	0.1	0.6	0.3	*0.0364
On Echrupry 1, 2021, why did you hold this sortification or lisonso2 (CLICINITRO)	0.2	0.1	0.1	0.1	0 2026
	0.5	0.1	0.1	0.1	0.5620
For which of the following reasons did you take work-related training during the past 12 months?					
(WTRINTRO)	0.1	<0.1	0.4	0.4	*0.0847
When thinking about a job, how important is each of the following factors to you? (EACINTRO)	0.2	0.1	0.1	-01	0 1 4 5 0
when thinking about a job, now important is each of the following factors to you? (FACINTRO)	0.2	0.1	0.1	<0.1	0.1450
During which of the following time periods did you take courses at a community college? (CSINTRO)	0.1	0.1	0.1	0.1	0.9628
Thinking back to the time(s) you attended community college, for which of the following reasons did					
you take community college courses? (CCINTRO)	0.2	0.1	0.2	0.2	0.7494
For which of the following reasons were you taking courses or annolled? (ACINITRO)	0.0	NI/A	0.7	0.7	NI / A
For which of the following reasons were you taking courses of enrolled? (ACINTRO)	0.0	N/A	0.7	0.7	N/A
Did your spouse's or partner's duties on his or her job require the technical expertise of a bachelor's	0.2	0.1	0.4		0.2245
degree or nigner in (SPINTRU)	0.2	0.1	0.4	0.3	0.3345
Which factors were important in your decision to first come to the United States for six months or	0.2		0.1	0.1	0.5633
Ionger ? (UMINTRO)	0.2	0.1	0.1	0.1	0.5623

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared breakoff rates for the screen by survey

	G (Prod	rid uction)	ltem-	by-item	
Screen (Census question ID)	Estimate	Std. error	Estimate	Std. error	Chi-square
Did your duties on this job require the technical expertise of a bachelor's degree or higher in					praie
(MGINTRO)	16.3	0.5	18.7	1.4	*0.0751
Did any of the following factors influence your decision to work in an area outside the field of your highest degree? (NRINTRO)	19.1	1.5	21.1	3.0	0.5086
The next question is about your work activities on your principal job. Which of the following work activities occupied at least 10 percent of your time during a typical work week on this job? (WAINTRO)	26.6	0.6	33.2	1.6	*<0.0001
Thinking about the principal job you held during the week of February 1, 2021, how satisfied or dissatisfied were you with the following aspects of the job? (SATINTRO)	25.8	0.5	31.6	1.7	*0.0009
On February 1, 2021, why did you hold this certification or license? (CLICINTRO)	13.9	0.8	14.0	1.6	0.9592
For which of the following reasons did you take work-related training during the past 12 months? (WTRINTRO)	11.8	0.6	14.3	1.6	*0.0999
When thinking about a job, how important is each of the following factors to you? (FACINTRO)	18.6	0.4	25.2	1.4	*<0.0001
During which of the following time periods did you take courses at a community college? (CSINTRO)	13.0	0.6	14.0	1.5	0.5249
Thinking back to the time(s) you attended community college, for which of the following reasons did you take community college courses? (CCINTRO)	16.9	0.7	23.6	1.9	*0.0003
For which of the following reasons were you taking courses or enrolled? (ACINTRO)	22.5	2.4	29.9	6.2	0.2486
Did your spouse's or partner's duties on his or her job require the technical expertise of a bachelor's degree or higher in (SPINTRO)	11.0	0.5	12.3	1.7	0.4458
Which factors were important in your decision to first come to the United States for six months or longer? (CMINTRO)	17.3	1.7	19.6	3.1	0.5051
Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment					

Table 32: Changed answers by question as a percent of respondent screen visits for the grid and item-by-item questions

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared changed answer rates for the question by survey

Grid Item-by-iter (Production) (Bridge Pane	Item-by-item (Bridge Panel)		
Question (Census question ID)ItemEstimateStd. errorEstimateStd.	error	p-value	
Did your duties on this jobEngineering, computer science, math, or the natural sciences4.80.36.9	0.7	*0.0026	
require the technical expertise The social sciences 4.3 0.3 5.2	0.7	0.2207	
of a bachelor's degree or higher in (MGINTRO)Some other field (e.g., health, business, or education), specify9.60.48.0	0.9	*0.0975	
Pay, promotion opportunities 4.2 0.7 4.3	1.7	0.9251	
Working conditions (e.g., hours, equipment, working environment)4.20.73.0	1.1	0.4290	
Job location 4.2 0.8 4.2	1.5	0.9578	
Did any of the following factorsChange in career or professional interests2.90.61.8	0.9	0.3337	
influence your decision to work Family-related reasons (e.g., children, spouse's job moved) 2.4 0.5 2.3	1.0	0.9077	
In an area outside the field of your highest degree? Job in highest degree field not available 3.8 0.6 5.4	2.0	0.3838	
(NRINTRO) Some other factor, specify 6.6 0.8 6.4	1.7	0.9271	
Accounting, finance, contracts 2.3 0.2 2.6	0.6	0.6632	
Basic researchstudy directed toward gaining scientific knowledge primarily for its own sake4.70.37.1	0.9	*0.0031	
Applied researchstudy directed toward gaining scientificknowledge to meet a recognized need2.80.23.6	0.7	0.2126	
Developmentusing knowledge gained from research for the production of materials, devices3.80.33.6	0.6	0.8431	
Design of equipment, processes, structures, models 2.5 0.2 2.7	0.5	0.6831	
Computer programming, systems or applications development2.00.22.6	0.6	0.2502	
Human resourcesincluding recruiting, personnel development, training3.60.3	0.7	0.9925	
Managing or supervising people or projects4.20.34.5	0.6	0.6875	
Production, operations, maintenance (e.g., chip production, operating lab equipment)1.90.22.6	0.5	0.1336	
The next question is about your work activities on yourProfessional services (e.g., health care, counseling, financial services, legal services)2.90.24.8	0.7	*0.0025	
principal job. Which of the following work activities occupied at least 10 percent of relations 2.4 0.2 4.6	0.8	*0.0010	
vour time during a typical work Quality or productivity management 1.9 0.2 3.4	0.5	*0.0011	
week on this job? (WAINTRO) Teaching 2.9 0.3 3.3	0.6	0.5480	

Table 33: Changed answers by item as a percent of respondent screen visits for the grid and item-by-item questions

		G (Produ	rid uction)	Item-b (Bridge	Chi-square	
Question (Census question ID)	Item	Estimate	Std. error	Estimate	Std. error	p-value
	Other activity, specify	3.4	0.3	1.9	0.4	*0.0201
	Salary	6.0	0.4	6.7	0.9	0.4800
	Benefits	4.0	0.2	4.1	0.7	0.8571
	Job security	4.3	0.3	4.5	0.6	0.6869
	Job location	4.8	0.3	4.6	0.7	0.8093
Thinking about the principal	Opportunities for advancement	5.5	0.3	5.8	0.8	0.6994
job you held during the week	Intellectual challenge	4.4	0.3	5.6	0.9	0.1539
of February 1, 2021, now satisfied or dissatisfied were	Level of responsibility	3.8	0.2	5.8	0.9	*0.0081
you with the following aspects	Degree of independence	4.1	0.3	5.8	0.8	*0.0205
of the job? (SATINTRO)	Contributions to society	4.7	0.3	4.5	0.7	0.8542
	To improve skills or knowledge in my current occupational					
	field	3.8	0.5	4.8	1.2	0.3857
	To increase opportunities for promotion or advancement in my current occupational field	3.0	0.4	3.6	0.9	0.5032
	To facilitate a chance to a different occupational field	3.0	0.3	4.6	1.1	*0.0851
On February 1, 2021, why did	Required or expected by employer	3.3	0.5	2.3	0.8	0.3347
you hold this certification or	To start my own business	1.7	0.3	0.8	0.2	*0.0204
license? (CLICINTRO)	Other reason, specify	2.7	0.3	2.7	0.9	0.9515
	To improve skills or knowledge in my current occupational field	1.0	0.2	1.5	0.4	0.2069
	To increase opportunities for promotion or advancement in my current occupational field	2.0	0.3	2.3	0.7	0.6193
	For licensure or certification in my current occupational field	2.3	0.3	2.5	0.6	0.7469
	To facilitate a change to a difference occupational field	1.8	0.3	2.1	0.7	0.7126
For which of the following	Required or expected by employer	2.9	0.3	2.5	0.6	0.6183
related training during the past	For leisure or personal interest	3.1	0.4	4.1	1.0	0.3095
12 months? (WTRINTRO)	Other reason, specify	1.2	0.2	1.1	0.4	0.6936
	Salary	3.3	0.2	3.6	0.6	0.6082
When thinking about a job	Benefits	2.7	0.2	2.5	0.5	0.7980
how important is each of the	Job security	2.5	0.2	3.3	0.5	0.1201

			rid uction)	Item-l (Bridge	Chi-square	
Question (Census question ID)	Item	Estimate	Std. error	Estimate	Std. error	p-value
following factors to you?	Job location	3.5	0.2	3.3	0.6	0.6664
(FACINTRO)	Opportunities for advancement	3.4	0.2	5.0	0.7	*0.0076
	Intellectual challenge	2.6	0.2	3.8	0.7	*0.0540
	Level of responsibility	2.8	0.2	4.8	0.7	*0.0010
	Degree of independence	2.8	0.2	3.5	0.6	0.2137
	Contribution to society	3.9	0.3	5.9	0.8	*0.0070
	Before graduating from high school or earning a high school equivalency certificate	1.2	0.2	2.1	0.7	0.1183
	After high school and before ever enrolling in a 4-year college or university	4.1	0.3	4.5	1.0	0.6774
During which of the following	While enrolled in a 4-year college or university and before receiving my first bachelor's degree	3.7	0.4	3.0	0.8	0.4092
time periods did you take courses at a community	After leaving a 4-year college or university without receiving my first bachelor's degree	5.1	0.4	4.5	0.9	0.5835
college? (CSINTRO)	Any time after receiving my first bachelor's degree	2.2	0.2	1.5	0.5	0.2778
	To earn college credits while still attending high school	1.0	0.2	2.1	0.7	*0.0543
	To complete an associate degree	1.5	0.2	2.9	0.6	*0.0088
	To prepare for college/increase change of acceptance to a 4-year college or university	2.6	0.3	4.2	1.1	*0.0822
	To earn credits for a bachelor's degree	2.1	0.3	2.8	0.8	0.3029
	For financial reasons (e.g., cost of a 4-year school)	2.4	0.3	4.0	0.9	*0.0433
	To gain further skills or knowledge in my academic or occupational field	4.2	0.3	5.6	1.0	0.1109
Thinking back to the time(s)	To facilitate a chance in my academic or occupational field	2.3	0.3	1.9	0.5	0.4591
college, for which of the	To increase opportunities for promotion, advancement, or higher salary	2.0	0.3	2.8	0.8	0.2266
community college courses?	For leisure or personal interest	1.7	0.2	2.9	0.9	0.1123
(CCINTRO)	Other reason, specify	1.4	0.2	0.9	0.3	0.2065
	To gain further education before beginning a career	3.6	0.8	3.8	1.8	0.9068
	To prepare for graduate school or further education	5.8	1.4	8.1	3.5	0.5159
	To change my academic or occupational field	4.8	1.2	4.2	2.1	0.7990
For which of the following reasons were you taking	To gain further skills or knowledge in my academic or occupational field	1.9	0.7	12.2	5.5	*<0.0001
courses or enrolled? (ACINTRO)	For licensure or certification	4.0	1.2	0.7	0.4	*0.0033

		Grid Item-by-item (Production) (Bridge Panel)			by-item e Panel)	Chi-square
Question (Census question ID)	Item	Estimate	Std. error	Estimate	Std. error	p-value
	To increase opportunities for promotion, advancement, or higher salary	2.0	0.7	1.8	0.9	0.8837
	Required or expected by employer	4.6	1.2	4.0	2.1	0.7571
	For leisure or personal interest	4.2	1.0	4.5	2.1	0.9208
	Some other reason, specify	2.6	0.8	0.0	N/A	N/A
Did your spouse's or partner's	Engineering, computer science, math or the natural sciences	3.3	0.3	4.9	1.0	*0.0757
duties on his or her job require	The social sciences	3.0	0.3	2.4	0.6	0.4370
bachelor's degree or higher	Some other field (e.g., health, business, or education),					
in (SPINTRO)	specify	6.4	0.5	5.6	1.2	0.5758
	Family-related reasons	5.4	1.1	7.0	2.3	0.5203
	Educational opportunities in the United States	4.3	0.8	6.3	2.0	0.3328
	Jobs or economic opportunities	4.9	1.1	7.1	2.6	0.3865
Which factors were important	Scientific or professional infrastructure in my field	3.2	0.8	3.8	1.8	0.7567
to the United States for six	It was not my decision	3.5	0.7	4.1	1.0	0.6093
months or longer? (CMINTRO)	Some other reason, specify	4.9	1.3	2.2	1.0	0.1320

*Denotes statistical significance at alpha 0.10 Note: Rao-Scott Chi-square test compared changed answer rates for each item by survey

	Grid (Production)		Item-by-item (Bridge Panel)		
Screen (Census question ID)	Estimate	Std. error	Estimate	Std. error	p-value
Did your duties on this job require the technical expertise of a bachelor's degree or higher in (MGINTRO)	21.7	0.3	21.8	0.6	0.8679
The next question is about your work activities on your principal job. Which of the following work activities occupied at least 10 percent of your time during a typical					
work week on this job? (WAINTRO)	57.7	0.5	56.7	1.3	0.4535
Thinking about the principal job you held during the week of February 1, 2021, how satisfied or dissatisfied were you with the following aspects of the job? (SATINTRO)	29.8	0.3	32.1	0.6	*0.0004
On February 1, 2021, why did you hold this certification or license? (CLICINTRO)	21.7	0.3	22.5	0.7	0.2812
For which of the following reasons did you take work-related training during the past 12 months? (WTRINTRO)	19.5	0.2	19.4	0.7	0.9701
When thinking about a job, how important is each of the following factors to you? (FACINTRO)	24.1	0.2	27.1	0.4	*<0.0001
During which of the following time periods did you take courses at a community college? (CSINTRO)	25.3	0.3	24.9	0.8	0.5766
Thinking back to the time(s) you attended community college, for which of the following reasons did you take community college courses? (CCINTRO)	32.6	0.4	33.3	0.6	0.3431
For which of the following reasons were you taking courses or enrolled? (ACINTRO)	25.1	0.7	28.2	1.9	0.2938
Did your spouse's or partner's duties on his or her job require the technical expertise of a bachelor's degree or higher in (SPINTRO)	15.9	0.2	15.1	0.9	0.4695
Which factors were important in your decision to first come to the United States for six months or longer? (CMINTRO)	18.3	0.5	22.0	0.8	*0.0001

Table 34: Median completion time in seconds for the grid and item-by-item questions

*Denotes statistical significance at alpha 0.10

Note: T-test compared medians between production and Bridge Panel

Cross-tabulations of Sex, Birth Sex, and Sexual Orientation minorities by demographic characteristics are provided in Table 35 to Table 37. The number of gender minority respondents was less than 25, which made division into demographic characteristics too small to report for our disclosure standards.

			Male		Female	
Demographic Charact	eristic	Percent	Std. error	Percent	Std. error	p-value
	0 to 29	11.0	0.5	13.7	0.5	
	30 to 39	23.8	0.6	25.3	0.5	-
A = = = = = = = =	40 to 49	20.2	0.6	22.2	0.6	-
Age group	50 to 59	18.9	0.6	17.4	0.5	-
	60 to 75	26.1	0.8	21.4	0.5	-
	Total	100.0	-	100.0	nale Chi-se Std. error p-va 0.5 0.5 0.5 0.5 0.5	*<.0001
Citizenship status at birth Highest degree level collapsed	U.S. citizen at birth	84.3	0.5	85.7	0.5	
	Not a U.S. citizen at birth	15.7	0.5	14.3	0.5	-
DILLI	Total	100.0	-	100.0	-	*0.0355
Highest degree level	Bachelors or professional degree	68.8	0.5	66.5	0.6	
	Masters or doctorate degrees	31.2	0.5	33.5	0.6	
conapseu	Total	100.0	-	100.0	-	*0.0007
Hispanic Origin	Hispanic	7.8	0.3	9.4	0.3	
	Non-Hispanic	92.2	0.3	90.6	0.3	-
	Total	100.0	-	100.0	-	*<.0001
Marital status	Married	65.9	0.8	59.0	0.6	
	Not married	34.1	0.8	41.0	0.6	
conapseu	Total	100.0	-	100.0	-	*<.0001
	White	80.4	0.4	77.2	0.4	
Race collapsed	Not White	19.6	0.4	22.8	0.4	
	Total	100.0	-	100.0	-	*<.0001
	Science and engineering	16.1	0.3	4.5	0.1	
Science and	Non-science and engineering	72.2	0.4	79.5	0.4	
occupation	Science and engineering related	11.7	0.3	16.0	0.4	
	Total	100.0	-	100.0	-	*<.0001
	Science and engineering degree	53.2	0.6	44.1	0.4	*<.0001

Table 35: Sex (production) by ACS demographic characteristics

		ſ	Male	Female		Chi-square
Demographic Characteristic		Percent	Std. error	Percent	Std. error	p-value
Science and	Non-science and engineering degree	46.8	0.6	55.9	0.4	
engineering degree	Total	100.0	-	100.0	-	

*Denotes statistical significance at alpha $0.10\,$

Note: Rao-Scott Chi-square test compared male and female distributions

Table 36: Birth sex (Bridge Panel) by ACS demographic characteristics

		Male Female		Chi-square		
Demographic C	haracteristic	Percent	Std. error	Percent	Std. error	p-value
	0 to 29	13.2	1.6	13.1	1.4	
	30 to 39	21.5	1.7	22.8	1.8	
	40 to 49	16.3	1.5	22.3	1.5	
Age group	50 to 59	18.6	1.5	18.4	1.7	
	60 to 75	30.4	2.0	23.5	1.7	
	Total	100.0	-	100.0	-	*0.0402
Citizonahin	U.S. citizen at birth	84.4	0.8	86.5	0.9	
status at hirth	Not a U.S. citizen at birth	15.6	0.8	13.5	0.9	
Status at birth	Total	100.0	-	100.0	-	0.1014
Highest	Bachelors or professional degree	70.4	1.3	63.4	1.7	
degree level	Masters or doctorate degrees	29.6	1.3	36.6	1.7	
collapsed	Total	100.0	-	100.0	-	*0.0014
Llionomia	Hispanic	7.5	0.4	10.0	0.3	
Alspanic	Non-Hispanic	92.5	0.4	90.0	0.3	
Ongin	Total	100.0	-	100.0	-	*<.0001
Marital status	Married	62.9	2.3	60.9	2.6	
ividrital status	Not married	37.1	2.3	39.1	2.6	
conapsed	Total	100.0	-	100.0	-	0.6138
Daga	White	79.8	0.7	77.8	0.7	
collansed	Not White	20.2	0.7	22.2	0.7	
conapsed	Total	100.0	-	100.0	-	*0.0305
Science and	Science and engineering	14.9	0.6	4.5	0.2	
engineering	Non-science and engineering	74.3	1.0	80.2	0.9	
occupation	Science and engineering related	10.7	0.7	15.3	0.9	*<.0001

		М	ale	Fe	Chi-square	
Demographic C	haracteristic	Percent	Std. error	Percent	Std. error	p-value
	Total	100.0	-	100.0	-	
Science and	Science and engineering degree	52.8	2.0	42.9	1.8	
engineering	Non-science and engineering degree	47.2	2.0	57.1	1.8	
degree	Total	100.0	-	100.0	-	*0.0007

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared male and female distributions

Table 37: Sexual orientation minority (Bridge Panel) by ACS demographic characteristics

		Sexual (Mi	Drientation nority	Not N	Ainority	Chi-square
Demographic C	Characteristic	Percent	Std. error	Percent	Std. error	p-value
	0 to 29	31.0	6.0	12.2	1.1	
Age group	30 to 39	20.5	6.8	21.9	1.5	-
Ago group	40 to 49	14.7	5.0	20.2	1.0	
Age group	50 to 59	27.4	6.2	18.2	1.1	
Citizenship	60 to 75	6.4	1.8	27.5	1.4	
	Total	100.0	-	100.0	-	*<.0001
Citizenskin	U.S. citizen at birth	89.0	3.6	85.4	0.7	
Citizenship status at birth	Not a U.S. citizen at birth	11.0	3.6	14.6	0.7	
	Total	100.0	-	100.0	-	0.3898
Highest	Bachelors or professional degree	75.3	5.7	65.8	1.2	
degree level	Masters or doctorate degrees	24.7	5.7	34.2	1.2	
Demographic ChaAge group3Age group5G7Citizenship status at birth1Highest degree level collapsedNHispanic Origin1Marital status collapsedNRace collapsed1Race collapsed1Race collapsedN	Total	100.0	-	100.0	-	0.1360
l lienen in	Hispanic	11.4	3.7	9.0	0.4	
Hispanic	Non-Hispanic	88.6	3.7	91.0	0.4	
Origin	Total	100.0	-	100.0	-	0.5002
	Married	26.8	5.7	64.6	1.6	
iviarital status	Not married	73.2	5.7	35.4	1.6	
conapseu	Total	100.0	-	100.0	-	*<.0001
Dese	White	80.8	4.2	78.7	0.6	
KaCe	Not White	19.2	4.2	21.3	0.6	
conapseu	Total	100.0	-	100.0	-	0.6229

		Sexual C Mii	rientation nority	Not N	Chi-square	
Demographic Characteristic		Percent	Std. error	Percent	Std. error	p-value
Colonea and	Science and engineering	8.3	1.6	9.4	0.3	
Science and	Non-science and engineering	73.1	5.0	77.5	0.7	
engineering	Science and engineering related	18.6	4.8	13.1	0.6	
occupation	Total	73.1 ed 18.6 100.0	-	100.0	-	0.2513
Science and	Science and engineering degree	52.2	7.0	47.1	1.4	
engineering	Non-science and engineering degree	47.8	7.0	52.9	1.4	
degree	Total	100.0	-	100.0	-	0.4770

*Denotes statistical significance at alpha 0.10

Note: Rao-Scott Chi-square test compared minority and not minority distributions

Appendix I Salary and Earned Income by Broad Occupation Category

Table 38: Mean salary by broad occupation category for 2021 NSCG production and bridge panel surveys

	Prod	uction Bridge Panel		Difference			
Broad Occupation Category	Mean	Std. error	Mean	Std. error	Difference	Std. error	p-value
Biological/Life Scientists	83,180	3,931	85,020	12,960	-1,845	13,700	0.8932
Clerical/Administrative Support Occupations	42,970	1,442	39,510	2,960	3,456	3,092	0.2669
Clergy/Other Religious Workers	48,820	5,334	45,080	5,428	3,741	7,516	0.6200
Computer Occupations	105,800	1,335	107,600	4,747	-1,759	4,951	0.7233
Counselors	52,760	1,810	50,330	11,890	2,434	11,990	0.8397
Engineers/Architects	115,100	1,766	110,200	6,091	4,967	6,332	0.4351
Engineering Technologists/Technicians/Surveyors	88,340	2,984	72,670	7,326	15,670	8,043	*0.0548
Farmers/Foresters/Fishermen	46,110	5,484	96,930	13,440	-50,820	15,360	*0.0014
Health Occupations	102,600	3,755	112,500	7,184	-9,910	8,380	0.2405
Lawyers/Judges	175,100	26,550	174,600	34,200	514.40	41,950	0.9902
Librarians/Archivists/Curators	51,280	8,006	21,790	6,643	29,490	10,210	*0.0050
Managers, Top-level Executives/Administrators	182,500	9,433	151,200	17,770	31,280	20,060	0.1228
Managers, Other	137,000	4,718	136,500	9,037	453.60	10,250	0.9648
Management-Related Occupations	97,550	2,801	97,730	5,259	-185.00	5,762	0.9745
Mathematical Scientists	105,400	5,067	78,100	8,589	27,330	10,920	*0.0144
Physical Scientists	86,780	3,045	105,000	22,050	-18,250	21,450	0.3974
Sales/Marketing Occupations	82,740	5,038	62,400	4,471	20,340	6,484	*0.0024
Service Occupations, Except Health	48,330	2,608	42,140	4,531	6,195	5,537	0.2666
Social Scientists	81,930	5,067	84,970	10,310	-3,036	11,130	0.7856
Social Workers	54,110	1,953	51,370	7,142	2,744	7,407	0.7121
Teachers—Precollege	57,240	2,110	56,330	2,669	913.00	3,454	0.7922
Teachers/Professors—Postsecondary	74,400	2,995	70,720	8,253	3,684	8,427	0.6632
Teachers—Other	32,790	6,293	38,380	6,527	-5,592	9,311	0.5498
Writers/Editors/Public Relations Specialists/Artists/Entertainers/Broadcasters	56,620	4,839	35,330	6,141	21,290	6,576	*0.0018
Other Professions	65,920	6,009	65,350	9,685	573.20	12,110	0.9624
Other Occupations	64,050	4,640	132,000	41,980	-67,940	42,070	0.1103

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment, SALARY by N2OCPR-recoded to broad category

*Denotes statistical significance at alpha 0.10.

Note: T-test compared means between production and Bridge Panel
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	Production		Bridge Panel		Difference			
Broad Occupation Category	Mean	Std. error	Mean	Std. error	Difference	Std. error	p-value	
Biological/Life Scientists	86,460	5,592	89,340	17,730	(2,881)	18,910	0.8793	
Clerical/Administrative Support Occupations	43,820	1,688	43,290	4,672	526.60	4,854	0.9139	
Clergy/Other Religious Workers	55,210	5,197	47,400	4,369	7,806	7,026	0.2699	
Computer Occupations	112,400	2,091	114,400	6,527	(2,059)	7,108	0.7728	
Counselors	50,940	2,454	50,870	12,050	72.95	12,180	0.9952	
Engineers/Architects	129,800	5,655	114,900	6,365	14,920	8,687	*0.0898	
Engineering Technologists/Technicians/Surveyors	96,490	4,142	76,260	8,483	20,230	9,761	*0.0415	
Farmers/Foresters/Fishermen	46,190	6,034	87,500	8,356	(41,300)	10,490	*0.0002	
Health Occupations	100,400	3,992	127,000	11,220	(26,590)	12,380	*0.0348	
Lawyers/Judges	249,000	55,490	187,500	46,800	61,510	72,170	0.3966	
Librarians/Archivists/Curators	51,440	8,039	28,740	3,219	22,700	8,585	*0.0098	
Managers, Top-level Executives/Administrators	259,200	20,400	183,300	19,580	75,890	26,880	*0.0060	
Managers, Other	154,000	6,293	260,600	111,800	(106,600)	111,800	0.3433	
Management-Related Occupations	109,500	4,668	112,200	8,630	(2,644)	10,260	0.7973	
Mathematical Scientists	113,800	8,317	80,430	9,027	33,380	13,280	*0.0139	
Physical Scientists	85,280	2,995	138,700	36,610	(53,390)	36,330	0.1456	
Sales/Marketing Occupations	89,250	5,922	66,920	4,909	22,340	7,749	*0.0051	
Service Occupations, Except Health	51,480	3,653	43,870	4,563	7,613	6,164	0.2204	
Social Scientists	82,290	5,855	86,800	9,620	(4,510)	10,870	0.6794	
Social Workers	53,230	1,858	50,500	6,216	2,723	6,392	0.6713	
Teachers—Precollege	54,430	1,259	55,070	3,225	(645.70)	3,597	0.8580	
Teachers/Professors—Postsecondary	80,510	3,386	81,910	10,130	(1,402)	10,330	0.8924	
Teachers—Other	32,850	6,882	37,160	6,157	(4,301)	9,389	0.6481	
Writers/Editors/Public Relations Specialists/Artists/Entertainers/Broadcasters	53,960	4,581	35,620	5,201	18,340	6,167	*0.0039	
Other Professions	66,240	5,986	58,660	9,002	7,579	11,350	0.5064	
Other Occupations	62,770	4,729	109,500	26,040	(46,700)	26,240	*0.0790	
Respondents Not Working During the Reference Week	40,380	2,201	36,270	4,271	4,109	4,596	0.3741	

Table 39: Mean earned income by broad occupation category for 2021 NSCG production and bridge panel surveys

Source: U.S. Census Bureau, 2021 National Survey of College Graduates Bridge Panel Experiment, EARN by N2OCPR-recoded to broad category *Denotes statistical significance at alpha 0.10.

Note: T-test compared means between production and Bridge Panel