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**Mailing Package, Digital Video Advertisement, and the Census Landing Page:
Evaluation of a Household Survey Respondent Experience**

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Abstract

Many government surveys now offer an online response option. Survey invitations, including those for online surveys, are still sent via the U.S. Postal Service, with the link to the online survey in the body of the mail piece. It is important to determine whether promoting surveys online could increase response to an online survey. The purpose of this respondent experience evaluation was to gather feedback about whether digital video advertisements and a redesigned landing webpage prominently featuring links to U.S. Census Bureau surveys might increase online survey response rates. For the purposes of this study, we applied these strategies to a simulation of the American Community Survey respondent experience. We found that recruited participants already had a very good impression of the Census Bureau and were willing to participate in government surveys at the start. Therefore, we did not find evidence that the addition of the video advertisement and landing webpage would necessarily improve response rates. Nonetheless, participants gave very positive feedback about their impressions of the video advertisement, though most indicated they would skip the advertisement and very few would have navigated to the landing page from the advertisement. Finally, while we identified minor usability issues with the redesigned landing page, it was still very effective in getting participants to the survey they were tasked with finding.

Keywords: eye tracking, facial expression recognition, user experience, user story

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1. Introduction

Many government surveys now offer an online response option. Survey invitations, including those for online surveys, are typically sent via the U.S. Postal Service, with the link to the online survey in the body of the mail piece. To access the online survey, the respondent has to locate the URL in the mailing materials and type the link into a computer or mobile device. The Census Bureau is investigating using online methods to connect the respondent to the survey, removing the need to locate and type in the URL.

Relying on a hard-copy printout of the URL could pose barriers for respondents. To the extent the mailings were successful at motivating a respondent to dedicate some time to log on to their PC or mobile device and complete the survey, some respondents may misplace their mailing materials; others may not have their materials handy when they get onto their computer/device; and still others may mistype the URL and quit out of frustration.

The purpose of this study was to explore whether two methods used in combination would improve online survey response rates for current Census Bureau household surveys. The first method was the presentation of a digital video advertisement that was developed to promote the Census Bureau mission and encourage selected households to respond to Census surveys. The second method was a redesign of the Census Bureau's landing page, which prominently featured a link to a page listing all Census Bureau surveys. To test the practical efficacy of these methods we inserted them into a simulated respondent experience of an American Community Survey (ACS) respondent. To this end, we provided ACS recruitment mailing materials to the study participants to allow them to have the perspective and knowledge of an individual from a sampled household before they saw the video advertisement and redesigned Census landing page.

In practice, online digital advertisements could be directed towards sampled households which, if clicked, would take the potential respondent to a website such as YouTube where they would see the Census promotional video. The respondent could then navigate from a link in the video to the redesigned Census Bureau landing page to see more information about the Census Bureau and its surveys. From this point, if the potential respondents were in a sampled household they could also click on the appropriate links to respond online. This report documents the findings from the evaluation of these methods which could affect the likelihood of a survey response. While this study used the ACS respondent experience as an example, we believe the results of this study could be used to inform marketing and design strategies for improving household survey response rates for other Census household surveys.

2. Background

In every month since January 2005, the U.S. Census Bureau has mailed notification letters to housing units across the United States inviting sampled households to respond to the American Community Survey (ACS) (U.S. Census Bureau, 2009). Between 2005 and 2010, the Census Bureau contacted approximately 2.0 million addresses per year; in 2011, 3.2 million addresses were contacted, and since 2012, we have contacted approximately 3.5 million addresses each year. We allow three months to collect data for each ACS monthly sample. In the first month, the initial survey invitation includes a URL for the online version of the ACS; a second reminder mailing is

sent. If the survey is not completed online, a third mailing including the paper ACS questionnaire arrives about three weeks after the first mailing. Instructions in the mailings ask respondents to complete the form and mail it back to the Census Bureau. After the first month of data collection, non-responding addresses are contacted by interviewers.

3. Research Questions

The testing objectives were to:

- Determine whether a digital advertisement encourages potential respondents to participate in Census Bureau surveys.
- Determine whether a Census Bureau landing page redesigned with easy navigation to Census Bureau surveys would improve survey response rates.
- Identify aspects of the landing page that decrease or increase the likelihood of someone answering the ACS after interacting with the landing page.
- Gather impressions of the digital advertisement and landing page when an ACS mailing package had been delivered.

To address these objectives, specific research questions were formulated:

- How likely are respondents to watch the digital advertisement and navigate to the landing page?
- What are respondents going to do on the redesigned landing page?
- What do respondents think the purpose of the landing page is?
- What aspects of the landing page grab the most attention?
- What are the viewer's feelings when watching the advertisement or seeing the landing page?
- Do the advertisement and landing page design improve the viewer's opinion of the Census Bureau and their self-reported willingness to complete the ACS?
- What is the self-reported likelihood of trying to complete the survey from the landing page?
- Can they navigate to the survey from the landing page? If so, are they using the large green link prominently displayed on the redesigned landing page?

4. Methods

4.1 Study Overview

One-on-one sessions were conducted with a participant and a test administrator (TA). In each session, the participant was shown the ACS mailing materials, followed by the digital advertisement, and then the landing page. Qualitative data were collected, including verbal reports, behavior data, self-reported opinion data, eye-tracking data, and facial expression data. All interviews were conducted in-person at Census Bureau headquarters.

4.2 Participants

Nine participants were recruited from the Washington DC metropolitan area to participate in this study. See Table 1 for participant demographics. Each respondent received a \$40 honorarium for participation.

Table 1. Participant Demographics

Participant Demographics	n=9
Sex	
Female	6
Male	3
Age in years: Mean (Range) (St.Dev.)	46.6 (26-63) (12.9)
Race	
White non-Hispanic	4
Black	5
Education	
Completed High School	1
Some College, No Degree	4
Associate's Degree	1
Bachelor's Degree	2
Post Bachelor's Degree	1

4.3. ACS Mailing Materials

The mailing materials provided to participants were the same as those that are initially sent out to individuals selected for the 2017 ACS. The envelope contained a letter from the Director of the Census Bureau, an internet instruction card with login information, and two brochures. The letter from the Director informs the recipient that they have been randomly selected to participate in the ACS, explains what the ACS is and how the data are used, states that the recipient is required by law to participate, and provides the website URL where they can go to complete the survey online. The internet instruction card contained the website URL but more importantly, the login ID needed to get into the survey. Of the two brochures providing general Census information, one was a list of frequently asked questions (FAQs) and the other was a multi-lingual brochure. The latter presented a small amount of text in several foreign languages that explained to the reader that completing the ACS is required by law, what the ACS is, that responses will be kept confidential, and that a paper questionnaire will arrive in a subsequent mailing.

4.4. Digital Video Advertisement

A 30-second video was created and shown to participants on YouTube, a popular website used to upload and share streaming videos. The purpose of this video advertisement was to promote the Census Bureau's mission by informing the viewer about what the Census Bureau does and to encourage them to respond to surveys from the Census Bureau. This video advertisement was

produced by Reingold, Inc. with oversight and input from the Census Bureau’s Communications Directorate.¹

4.5. Census Landing Page

A redesigned Census landing page was developed to direct people to Census surveys and the design facilitated this by including a main link that routed the participant to a Census webpage which helps the respondent determine if they are in a survey sample and that provides a list of household surveys. This link was presented as a large green button in the center of the landing page with the text “Respond to a Survey.” This button was set just beneath a large and interactive image of a family, which, if clicked, would also route the respondent to the same webpage. Other content, which was located beneath the fold (area of the screen not visible without scrolling), were links to YouTube videos about the Census Bureau and links to webpages where respondents can learn about Census data.²

4.6. Opinion and Willingness Questionnaire

A paper questionnaire was created to assess self-reported changes in opinion or willingness to participate in Census Bureau surveys after encountering the mailing materials, digital video advertisement, and the landing page. This questionnaire was a 5-point Likert scale that allowed participants to rate their opinion of the Census Bureau from “Very Favorable” to “Very Unfavorable,” and rate their willingness to complete a survey from the U.S. Census Bureau from “Very Willing” to “Very Unwilling.” This participant completed the same questionnaire several times throughout the session in order to assess changing attitudes from the different materials presented. The procedures are explained in detail in section 2.9 Procedure. The questionnaire is available in Appendix B.

4.7. Eye Tracking

Eye tracking data were collected using a Tobii X2-60 eye tracker and a T120 eye tracking monitor. Eight participants completed the study on a laptop using the X2-60 eye tracker and one participant completed the study on a desktop computer using the T120 eye tracking monitor. The Tobii software was programmed to automatically load the URL in Internet Explorer and to present the Census landing page to the participant. Once the website was brought up, the eye tracking data were recorded. Due to technical difficulties resulting from running the Tobii and Camtasia software simultaneously, data for six participants was lost, therefore eye tracking data from only three participants was used in the analysis.

¹ The advertisement can be viewed at the following URL: <https://www.youtube.com/watch?v=x-hh5-ic-sQ&list=PLhLB6X1ybZTSei5-DCgvsPsonAb7MCUu5&index=4>.

² Images of the landing page that was tested can be found in Appendix A or the actual webpage can be accessed at the URL: <http://author-publish.cms.asd.census.gov/programs-surveys/respond/promo.html>.

4.8. Facial Expression Recognition

Facial expression recognition software is a relatively new method and has recently been utilized in marketing and advertisement research (Lewinski, Fransen, & Tan, 2014; Chavaglia & Filipe, 2015; Loijens, et al., 2012; Van Kuilenburg, Wiering, & Den Uyl, 2005). We chose to use this as an additional objective measure to assess a participant's impressions of the digital video advertisement. Noldus FaceReader facial expression recognition software was used to analyze the faces of each participant from video recordings taken via a webcam attached to the testing computer. The purpose of collecting the facial expression data was to attempt to objectively assess each individual's emotional reaction to the digital video advertisement and determine whether he or she had a positive or negative impression of the video content. This software sampled facial expressions from the webcam face recordings at a rate of 30 Hz (i.e. facial expressions are assessed at a rate of 30 times per second).

4.9. Audio and Video Recording

Audio and video recordings of the session were collected in order to analyze qualitative data from the sessions and to be used for facial expression recognition. Audio was captured through a peripheral microphone set up on the desk near the participant and interviewer. Videos of the participant's faces for facial expression recognition were collected via a Microsoft LifeCam Studio webcam. For six participants, video of the laptop screen was also captured using Camtasia Studio screen recorder. However, not all sessions were recorded using Camtasia because this software corrupted the eye tracking data that was being collected simultaneously. For the other sessions Microsoft LifeCam Studio and Tobii software were used instead to record audio and video data.

4.10. Procedure

A study protocol was developed and used by the TA to ensure that each session was conducted using the same dialogue and followed a specific set of procedures (See Appendix C). After a brief introduction and obtaining consent from the participant to conduct the testing, audio and video recordings were started. Next, the participant was asked to complete a short demographic questionnaire that collected basic information such as age, sex, race, and education, results of which are presented in Table 1. Following the demographic questionnaire, the main portion of the study began where the ACS mailing materials, the digital video advertisement, and the redesigned Census landing page were presented in that specific order to the participant. The order of presentation mimicked the way a respondent might encounter these materials in the real world. We gathered the participant's opinion and willingness data between each material presentation.

The first opinion and willingness questionnaire was administered just before the ACS mailing materials were given to participants. These data were our baseline ratings. After this, participants were asked to pretend as if they received the ACS mailing materials at their home and to interact with them how they normally would interact with mail they received. For this part of the session, a think-aloud protocol was utilized, which requires that the participant continually verbalizes everything that they are thinking or feeling at the time. These spontaneous comments enabled us to identify any issues or areas of confusion during their interaction with the mailing materials that may not have been apparent through observation of their behavior alone. After participants finished interacting with the materials, they were asked a battery of probing questions found in

Appendix D and then they completed another opinion and willingness questionnaire. The probe questions were more deliberate, designed to elicit comments about particular aspects of interest to the research.

Next, eye tracking was started and the 30-second Census video advertisement was shown to participants. Participants were told not to think aloud during this part of the session and to only passively observe the video. Once the video finished playing, they answered a series of probe questions and then completed another questionnaire to assess changes in opinion and willingness to participate in a Census survey.

Finally, they were brought to the redesigned Census landing page while eye-tracking data continued to be collected. They were asked to resume thinking aloud during this part of the session and to pretend as if they had just arrived at this website by their own accord. Participants were allowed to navigate freely meaning that they did not have to stay on the landing page. If the participant did not begin interacting with the website on their own, then they were explicitly asked to do so by the TA. The TA stopped the participant either when it was clear that he or she had finished exploring the website or if he or she successfully navigated to the ACS. Following this task, participants were asked a set of probing questions and again completed the opinion and willingness questionnaire. At this point, if the participant had not previously searched and found the ACS on their own, eye tracking resumed and they were explicitly asked to find the ACS from the landing page.

4.11. Analysis

Qualitative and quantitative data were collected to address the various research questions. Qualitative data included verbal data shared during think-aloud periods, responses to question probes, and observed behavior. Only unique or high frequency issues are reported in the results section.

4.11.1 Opinion and Willingness

Opinion and willingness ratings were analyzed using a Friedman's Chi Square analysis. This non-parametric alternative to the repeated measure ANOVA was used due to the small sample size and the ordinal nature of Likert-scale data. This analysis determines if any differences between ratings assessed at baseline, post-mail materials, post-digital video advertisement, and post-landing page were statistically significant.

4.11.2 Facial Expression Recognition

The Noldus FaceReader algorithm (Kuilenburg, Wiering, & Uyl, 2005) processed the video recordings of participant faces and outputted an intensity value that ranges from 0 to 1 for seven different emotions. The emotions included neutral, happy, sad, angry, surprised, scared, and disgusted. Using these intensity values, we calculated a metric referred to as "valence." Valence simply determines if someone is in a happy or an unhappy state by taking the happiness intensity value and subtracting it by the greatest unhappy state intensity value: angry, sad, scared, or disgusted. The resulting valence value ranges from -1 to 1. If the happiness intensity value is greater than all of the unhappy state intensity values then the valence value will be positive and if

it is less than the unhappy state values, it will be negative. In short, a positive valence value (0 to 1) indicates that the individual is happy and a negative value (-1 to 0) indicates that they are unhappy. The closer this number is to 1 or -1, the stronger the positive or negative emotion. The valence value was calculated for each person for the 30-second digital advertisement video and then a group mean was calculated from the individual values. This overall group mean was used to represent the overall emotional state of our sample of participants.

4.11.3 Eye Tracking

Eye-tracking data were used to create a fixation count heat map for the first five seconds of viewing the Census landing page. The heat map showed the accumulated number of fixation points collapsed across all participants where each fixation point on an area added a value to the heat map. Color indicates that a fixation was made over an area and brighter red represents more fixation points. Fixation count was used to indirectly measure where most attention is paid to determine what features of the landing page are the most engaging.

5. Results

5.1 Mailing Materials

The think aloud and general question probes revealed both positive and negative findings towards the mailing materials. While, none of the participants made negative comments about the availability of the online option, three participants spontaneously said that they liked the option of completing the survey online.

“It looks like I go to the internet first, then complete the survey. I would just go online to complete the survey instead of doing it by mail.”

“That’s awesome because I like doing things online instead of paper and pencil.”

“I like that this web address is bolded and put in the middle and set off so I know that it’s gonna be online. It’s gonna be a lot quicker and easier.”

The probe, “Does anything stand out to you in the materials?” produced a few themes surrounding the required by law mandate and the amount of materials. Some participants did not know that response to a Census survey is required by law and two reacted negatively to the “required by law” statements throughout the materials

“‘Your response is required by law.’ I may or may not answer because I don’t like answering questions required by law if I have to put certain information.”

“I was going to do it anyway; you didn’t have to threaten me.” (When looking at the brochure and seeing a law requirement with penalty after already seeing a law requirement statement on the front of the envelope)

Three participants complained the envelope included far too much paper and information.

“There are 4 pieces of paper, seems like a lot. I don’t know why you have two of these things that are kind of the same thing.” (Referring to card and letter that both have URL)

“Nothing that important in terms of completing the survey. I would throw everything but the card away and put it in my pile of things to do.”

“Daunting”

5.2 Digital Video Advertisement

5.2.1 *Question probes*

Specific question probes were asked following the presentation of the digital video advertisement. Findings from these probe questions indicate that even though participants were positive or neutral toward the video, most of them would skip it. The other finding was that there was a disconnect between the tone of the mailing materials and the tone of the video, with the video being more friendly.

Responses to the probe, “What is your impression of this video advertisement?” which was asked immediately following video indicate that the first impressions of the digital video advertisement were generally very positive. Six participants responded positively while the remaining three participants made neutral remarks.

“I like the slickness of it because it’s important for a lot of people that might not be as willing to participate to sell it. You’ve got to sell it in the way that a product is sold. It’s short, it’s brief, and it’s to the point and attractively produced. It sells.”

“Good! It looks like a nice Hollywood ad! Lots of people. I think the message was to respond right away, which I would do. And you’re constantly evaluating change and I think that’s a good thing. It’s a nice upbeat, happy, and positive ad, which we need more of. Positive!”

“Caring”

“Seems Pleasant”

“That it’s very user friendly and that it’s important.”

“I think it was good. It’s telling me what the Census Bureau does and should I receive something from the Census Bureau, I should participate. It’s telling specifics, what they might give you a survey on like education or health or whatever. It was informative.”

Responses to the probe, “Do you have any additional comments or opinions about this advertisement?” resulted in some participants commenting on the uniqueness of the video on YouTube, suggesting that it drew their attention.

“For me, it’s unusual to see government videos on YouTube. I would probably give it a second or two longer than most videos that don’t interest me very much.”

“That it’s very slick. The fact that it’s a YouTube video, I don’t know why that matters to me but I notice it. I’m thinking that it sort of looks like, the slickness, it reminds me of a commercial that I would see on TV. But it’s informative.”

That probe also generated one comment about the perceived disparity between tone of mailing materials and digital advertisement.

“Seems pleasant that they are asking and not that people are required to respond to the survey. Seems voluntary.” (Mailing materials said required by law)

When asked, “If you saw this advertisement while going about your typical online activities, what would you do?” most participants reported that they would continue what they were doing after the video. Specifically, five reported that they would just skip the video after a few seconds and two participants responded that they would watch but immediately continue what they were already doing after it. However, two participants did say that they would click on the advertisement and go to the Census website.

Finally, when asked, “Do you or would you skip YouTube advertisements given the opportunity?” six participants said that they always skip video advertisements on YouTube when able. Only three reported that they sometimes watch the full advertisements.

5.2.2 Facial Expression Recognition

Valence values which indicate the nature of facial expressions (happy or unhappy) as well as the intensity of the facial expression varied significantly across individuals. Of the nine participants, five individuals had mean valence values that were negative, indicating an overall unhappy experience. The intensity of these values ranged from slightly negative to moderately negative, however, two participants in particular were displaying extremely negative intensity values of -0.96 and -0.89. The remaining four participants had positive valence intensity values ranging from slightly positive to moderately positive. The overall mean valence value for the entire group was

-0.18 indicating a somewhat unhappy state was present on average during the digital video advertisement.

Table 2. FaceReader Valence Intensity Values

Participant	Observations	Mean	SD	Min	Max
P1	900	0.03006	0.01989	-0.0205	0.08653
P2	722	-0.2122	0.16424	-0.7174	-0.0151
P3	891	-0.1168	0.2336	-0.8732	0.55343
P4	859	0.25813	0.38059	-0.3505	0.93089
P5	900	-0.897	0.16633	-0.9989	-0.2393
P6	877	0.03022	0.03305	-0.0029	0.21047
P7	733	0.22208	0.29966	-0.2811	0.73034
P8	357	-0.9689	0.02992	-0.9941	-0.7507
P9	900	-0.0428	0.0718	-0.3549	0.11459
Overall Mean		-0.1886			

Observations = Number of samples successfully recorded over the 30 second video at 30 Hz. A total of 900 observations was possible during the video. Mean = values for each participant are the mean of successfully recorded observations for that individual. SD = standard deviation of valence intensity values for each individual. Min = minimum intensity value observed out of total observations for that participant. Max = maximum intensity value observed out of total observations for that participant.

5.3 Census Landing Page

5.3.1 *Initial Behavioral Interactions*

The first action taken by participants upon visiting the landing page varied. Figure 1 displays the landing page, labeled with various components. Table 3 lists the different website elements that were clicked first and the number of participants that clicked them. Table 3 also includes a “Numeric Identifier” that can be used to find the element in the website image found in Figure 1. Only four participants scrolled down and scanned the entire webpage before clicking anything. It became apparent during testing that the screen resolution being tested prevented the green “Respond to Survey” button to be above the fold so it was only visible to participants who scrolled down and to one participant who completed the session using the Tobii T120 eye-tracking monitor, which had a larger visible area. Actions after the initial clicks varied but perhaps the most important finding was the three participants navigated to the ACS survey page.

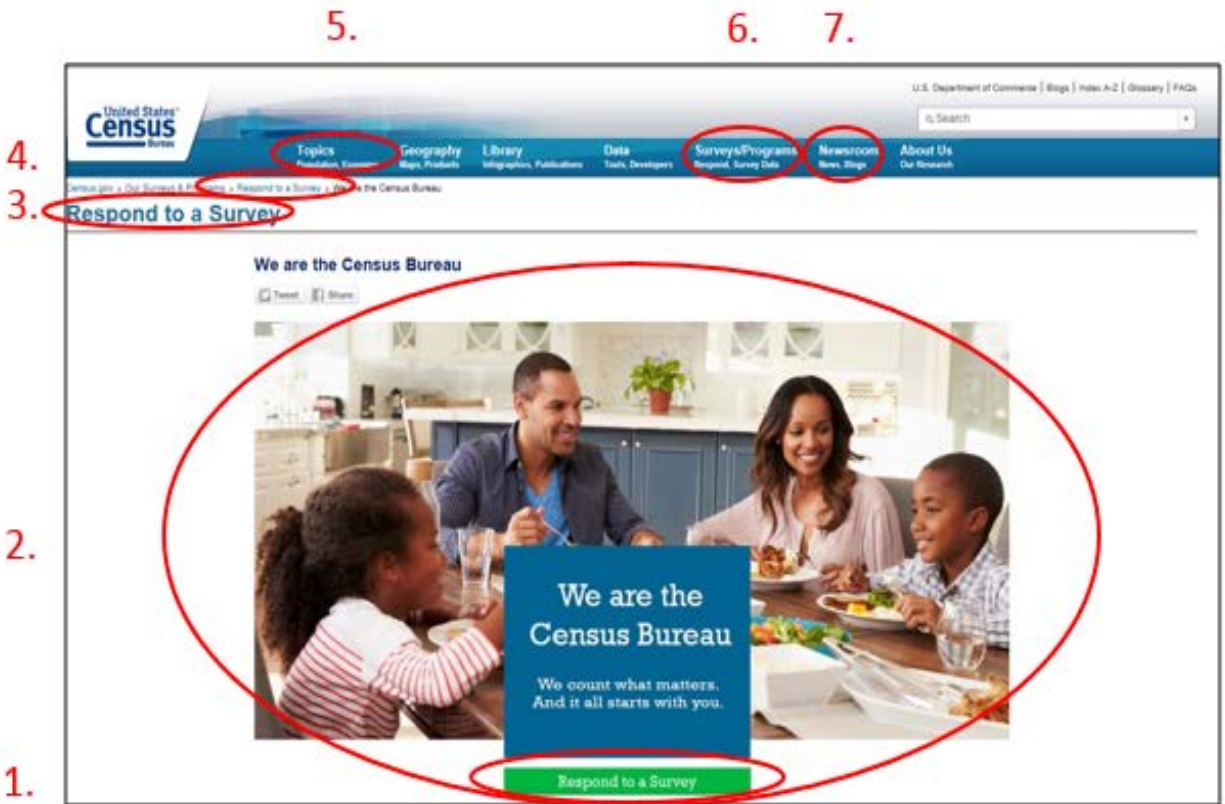


Figure 1. Image of Landing Page First Clicked Elements

Table 3. Landing Page First Clicked Elements

Numeric Identifier	Element	# Participants
1.	Green “Respond to a Survey” button	2
2.	Family Image	2
3.	Large “Respond to a Survey” Link	1
4.	The “Respond to Survey” navigational links in the breadcrumb trail	1
5.	Topics	1
6.	Surveys/Programs	1
7.	Newsroom	1

5.3.2 Eye Tracking and Initial Visual Engagement

Results of the fixation count heat map show that the most visually engaging feature of the landing page is the image of the family, followed by the “We are the Census Bureau” logo, the drop down topics, and the large “Respond to a Survey” link as shown in Figure 2.

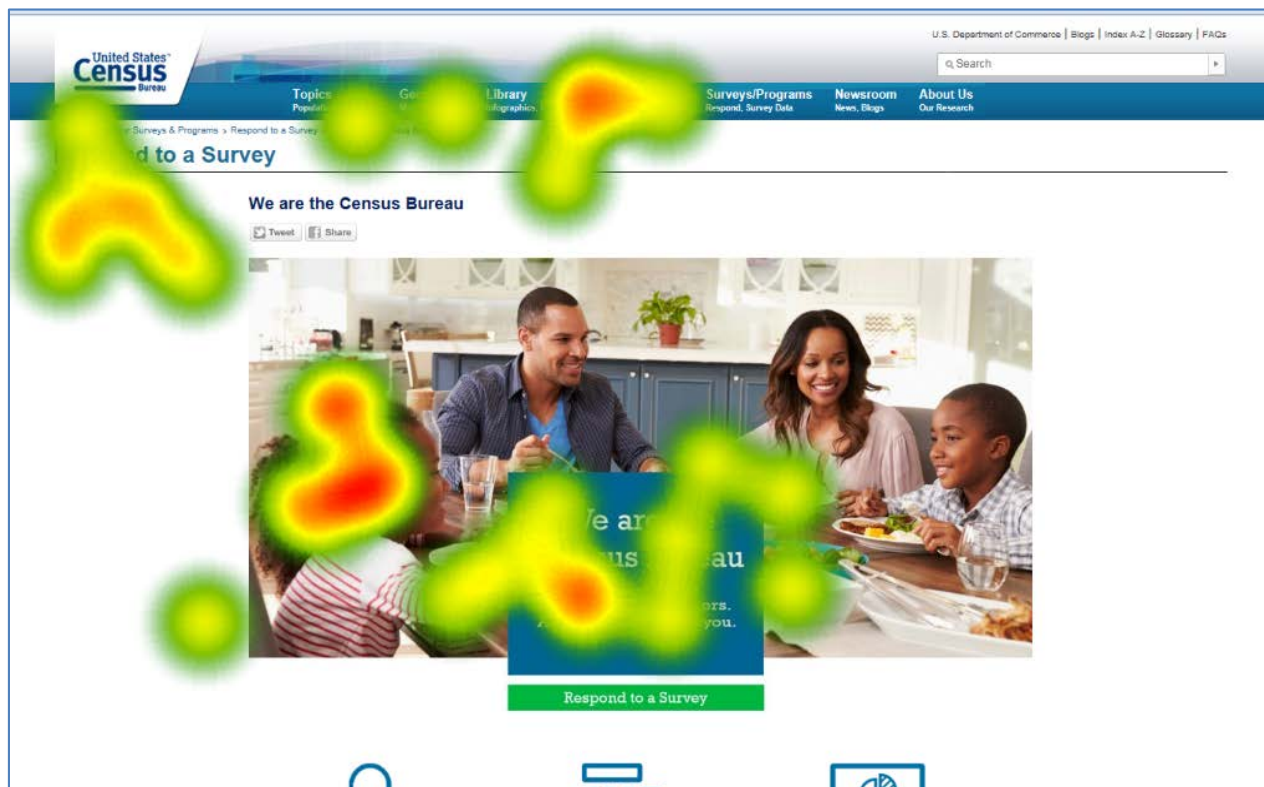


Figure 2. Eye Tracking Heat Map - 5 seconds on Census Landing Page (n=4)

5.3.3 Think Aloud

The think-aloud protocol supported the observed actions of the three participants who navigated to the ACS survey without being prompted. Each verbalized their intention to seek out the ACS survey while interacting with the landing page. One participant, after seeing the ACS listed among other surveys when clicking on Surveys/Programs link, said “I remember the ACS from the letter” before navigating to try and complete the survey. Another said “This is what would come up [referring to the website] after I try to do the survey that was just mailed to me” and “Mostly, I’m here to just respond to the survey so I’m going to hit that green button to get it all started.” The third participant said that they would not be here unless it was to fill out the survey. The think-aloud feedback from the other participants consisted of describing their experience while exploring the landing page and other pages they arrived at through links on the landing page.

5.3.4 Question Probes

Specific question probes were asked immediately after participants had finished interacting with the Census landing page. Findings from these probe questions based on the participant comments were very positive.

When asked, “What is your first impression of this webpage?” four participants in particular made positive comments. The remaining participants did not express an opinion or they were not asked because they gave their impression during the think aloud.

“I don’t know. It just looks really friendly”

“I liked that it’s clean and not cluttered. I liked the fact that respond to a survey is right at the top left to knock it out and do my duty.”

“I like the opening graphic, the photo of the family. Kind of giving you an identity of who they are addressing. I don’t see any menu options on the side, everything is at the top. Usually when I go to a website I look for a quick link on the side.”

“It’s an attractive page. It’s well set out. The picture’s a little kitschy.”

When asked, “What do you think the purpose of this landing page is?” responses could be broadly classified into three categories: that it was the Census Bureau homepage; that it was advertising surveys to complete; or both. One participant did not provide an answer that was relevant to the question.

(1) The Census Bureau homepage (4 participants):

“If I typed “Census Bureau” I figured this is what would come up.”

“To tell about the Census Bureau”

“I would consider that this was their website and they added the family to promote diversity. It’s in blue and white which indicates government. Those are usually the colors for those websites”

“I think it’s kind of to give you a feel good, what you are doing matters. And, keep it really simple. I think sometimes on a **home site**...”

(2) Advertise or respond to Census surveys (3 participants):

“This would be the opening page for when you have to fill out a survey.”

“To let people know that the Census Bureau is just looking for information about you, your family”

“To probably see how many people would respond to the Census Bureau”

(3) Both (1 participant):

“It seems all purpose. It seems like the purpose is to respond to the survey but it’s also all-purpose as being a landing page for the census bureau.”

When asked, “Do you have any other comments or opinions about this webpage?” one participant mentioned that it was interesting that there were links to twitter and other social media to share it if surveys are by invitation only.

“I thought it was interesting that it said tweet or share. I was under the impression that usually the Census surveys are by invitation only and I would be curious if I shared it, does that mean that I’m sharing the website like “hey, look what I did today, I filled out a survey for the census bureau” or check out this cool website and look at this information you can get. I don’t know that I would tweet or share that unless I wanted someone to participate. Other people might, I wouldn’t.”

5.3.5 ACS Survey Search Task

Three of the nine participants searched for and found the ACS survey upon arrival at the landing page during their very first interaction. The remaining six participants were explicitly asked to perform this task following the probing questions. Of these six participants, only one participant was unable to navigate to take the ACS survey online from the landing page. Table 4 describes the starting points used by the eight participants (including the three that found it before being directed) that found the ACS survey, the number of participants that followed the same path, and the numeric identifier to locate it on Figure 1. Four participants tried to use the large “Respond to a Survey” link in the top left (See Number 3 on Figure 1) but this link was broken during testing.

Table 4. Starting Point from Landing Page to Online ACS

Path Used	Number of Participants	Figure 1 Numeric Identifier
“Our Surveys & Programs” breadcrumb link.	1	4
“Surveys/Program” Dropdown	4	6
Green “Respond to Survey” button	3	1

5.4 Opinion and Willingness Ratings

Baseline ratings for overall opinion of the U.S. Census Bureau was overwhelmingly positive. Seven of nine participants rated their opinion as being “Very Favorable” (See Figure 3). Similarly, the baseline ratings of willingness to respond to Census surveys showed that most participants were already willing before seeing any paper or digital materials. Specifically, six of nine participants rated that they would be “Very Willing” to do so (See Figure 4). The results of the Friedman’s Chi Square found that opinion ($Q = 5.28$) and willingness ($Q = 1.00$) ratings of the Census Bureau did not significantly change following experiences with the mailing materials, the

digital video advertisement, or the Census landing page. Figures 5 and 6 show the mean ratings for opinion and willingness at each time point, respectively. There was a possible “ceiling effect” preventing improvements or increases in opinion and willingness from being detected (See Discussion section).

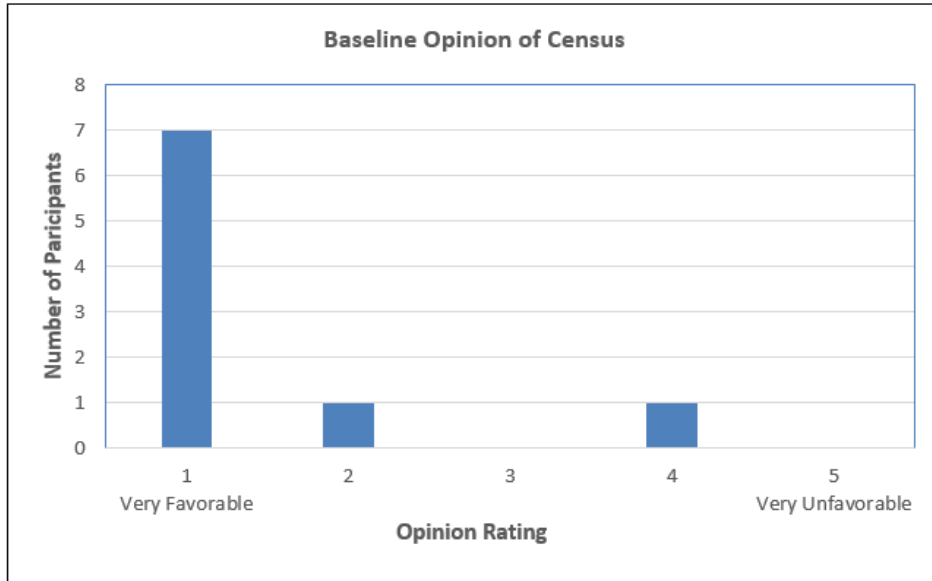


Figure 3. Baseline Opinion of the Census Bureau (n=9)

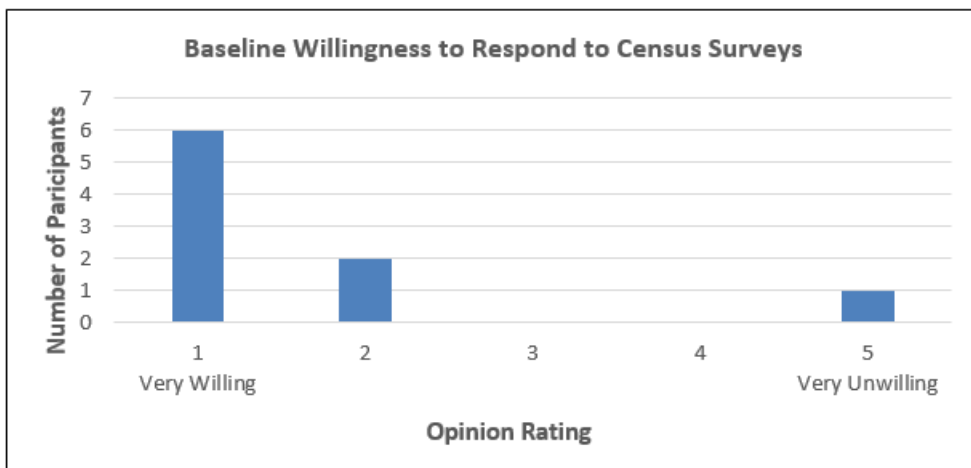


Figure 4. Baseline Willingness to Respond to Census Bureau Surveys (n=9)

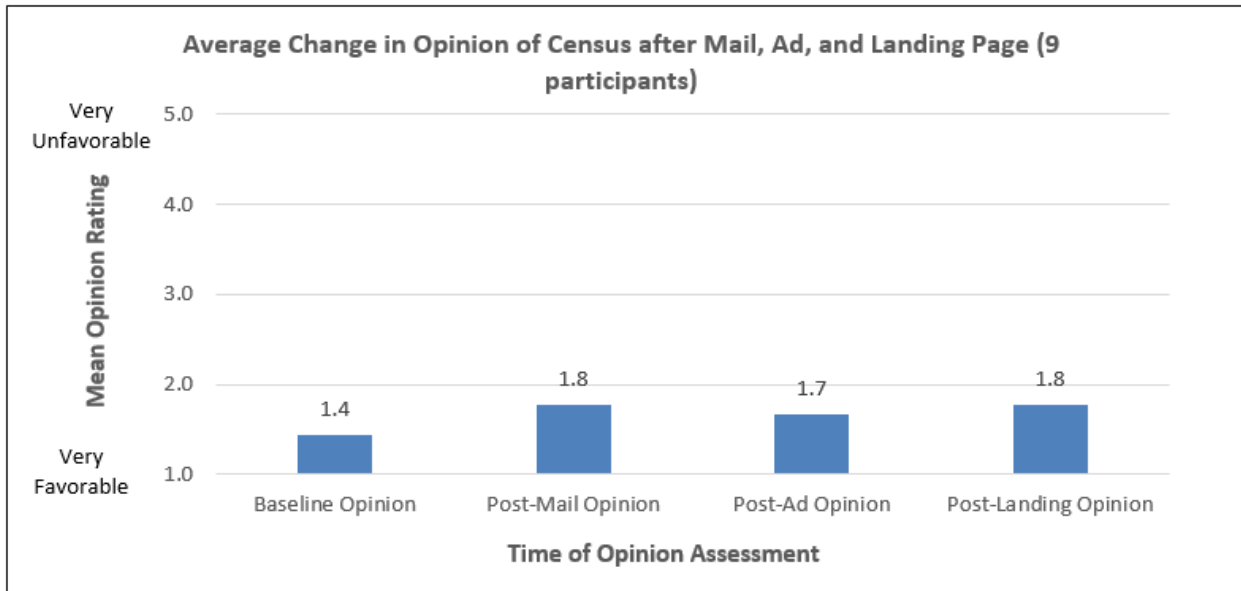


Figure 5. Average change in Opinion of Census Bureau after Mailing Materials, Digital Advertisement, and Website (n=9)

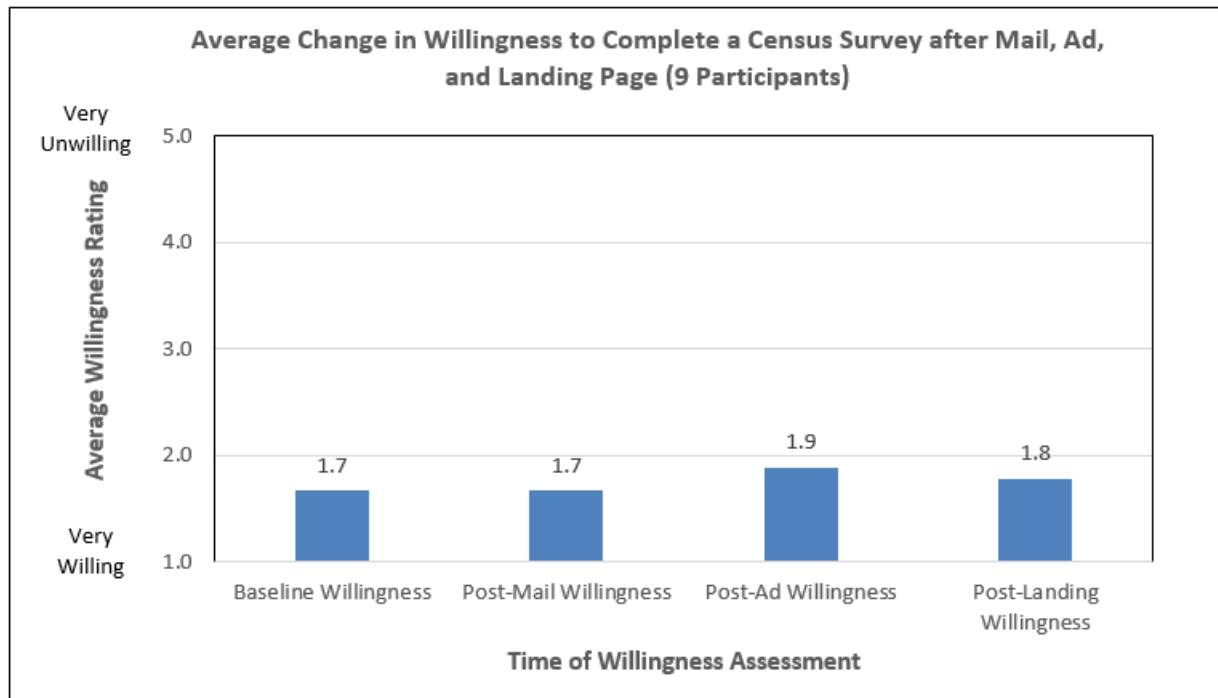


Figure 6. Average Change in Willingness to Complete a Census Bureau survey after Mailing Materials, Digital Advertisement, and Website (n=9)

6 Discussion

The purpose of this study was to evaluate a typical Census household survey respondent experience using the ACS, starting with the respondent receiving ACS survey mailing materials, then encountering a digital video advertisement for the Census Bureau on YouTube, and ending with an arrival to the Census landing page. In addition, there was a usability test component to identify any design or navigation issues with the redesigned Census landing page. There were two

primary objectives addressed by this study. The first objective was to gather impressions of the digital advertisement and the Census landing page when an ACS mail package has been delivered to mimic the full respondent experience. The other objective was to identify any aspects of the landing page that improve the likelihood of someone answering the ACS survey after interacting with the landing page. As this was a user experience study, or more specifically in this case, a respondent experience, the order in which the participants encountered the materials was chosen to mimic how they might encounter them in the real world. Therefore, the ACS mailing materials were presented first, followed by the Census digital video advertisement, and then the Census landing page.

6.2 Mailing Materials

In accordance with the first primary objective, ACS materials were provided to each participant in the beginning of the session before they saw the digital video advertisement or interacted with the Census landing page. Additionally, we collected participant feedback about the mailing materials during a think-aloud protocol and measured if there were any changes from baseline in opinion about the Census Bureau or willingness to participate in Census surveys after interacting with these materials. There were three primary findings from the think-aloud feedback. The first was that some participants really liked the online option to complete a government survey and this would be their preferred method of completing a survey. There were no negative comments about the survey being online which suggests that this is a very positive feature with few drawbacks. The second finding was that two participants perceived the “Required by law” language as being a bit threatening. This did not appear to affect opinion or willingness to participate ratings in a survey, so this is a minor issue. Additionally, while it is common that people don’t like that statement, it is effective in motivating response. The third finding, reported by several participants, was that there is too much paper and materials included in the envelope. Again, this did not affect willingness to complete a Census survey, so without additional testing it is impossible to know the significance of this issue. Opinion ratings of the Census Bureau were not affected after interacting with the mailing materials.

6.3 Digital Video Advertisement

6.3.1 *What are the viewer’s feelings when watching the advertisement?*

Responses to the probing questions about first impressions following the presentation of the video revealed that most participants had a very positive first impression of it. Comments not only pointed to a common theme using adjectives such as “nice,” “friendly,” and “caring,” but also that the video itself was very attractive and well produced “Like a Hollywood ad!” Another interesting finding was that some participants were surprised and liked that a government advertisement video was on YouTube. Somewhat at odds with the self-reported data, the facial expression recognition analysis results were mixed. Five participants had a mean negative facial expression during the digital video advertisement and only four had a mean positive expression. The expression

recognition analysis was an exploratory method to supplement the self-reported responses to the question probes. As we had never used these data before this was our first experience with facial expression data. We feel confident in the participant verbal feedback as it matches the self-reported opinion data. Therefore, the verbal data seems to be a more reliable indicator for participant feelings. One limitation with the facial recognition analysis was that the valence values were not compared against any sort of baseline. It could be that the values we measured are simply the natural facial expression of the participants at rest as they were only passively viewing a video. In the future, it may be more accurate to compare against a baseline valence value taken during the absence of any external stimuli. Another possibility worth exploring is to analyze the valence values during the time that participants were responding to question probes about their impressions of the video as the human face may be more expressive during verbal communication.

6.3.2 How likely are respondents to watch the digital advertisement and navigate to the landing page?

Based on these data, we speculate that it would not be very likely that someone would navigate to the landing page from the digital advertisement. Most participants reported that given the opportunity to skip the advertisement such as is possible on YouTube, they would. Only three of the nine participants reported that they sometimes voluntarily watch full video advertisements. Of particular interest was whether participants would click on the advertisement after receiving ACS mailing materials, which would bring them to the Census landing page. In response to a probing question on this topic, just two of the nine participants would click on the advertisement. While this number is low, it is also possible that these two individuals may have never navigated to the Census landing page on their own without the video.

6.3.3 Does the advertisement improve the viewer's opinion of the Census Bureau and their self-reported willingness to complete the ACS?

For these particular participants, the digital advertisement neither improved or diminished the opinion they held towards the Census Bureau or their self-reported willingness to complete a Census Bureau survey. However, these particular participants already had a very high opinion of the Census Bureau, which could not improve using the measurement tools we had designed.

6.4 Redesigned Census Landing Page

6.4.1 What are they likely to do on the landing page?

Participants were asked to pretend as if they had arrived at the website naturally. Some participants began interacting with it right away, but a handful needed to be explicitly instructed to do so. The landing page is quite long and very few participants scrolled down beyond what was visible on the screen initially. Therefore, most participants missed a lot of content on the landing page. Even still, all participants first interacted with elements located above the fold, which were visible without any scrolling. The sponsor was interested in whether the participants would interact with the green

“Respond to Survey” button in the center of the screen as this was supposed to be the primary purpose of the landing page. However, it became quickly apparent that the resolution used by our laptop (1366 x 768) created a situation where this button was beneath the fold. Our resolution is a standard resolution for most modern widescreen laptops, suggesting that the placement of the button was problematic. The result of the current design was that only two participants used this button and there was a relatively even distribution of other design elements that were first clicked by the other participants including the family image, breadcrumb links, the large “Respond to Survey” link, and various elements within the drop down menu. We recommend that this button be moved up higher on the page so no scrolling is required to see it. Another issue that was quickly identified during this testing was that the large “Respond to Survey” link in the top left corner was broken. Considering that the large text in this link is a direct “call to action” for a desired behavior of a landing page visitor, this is an issue that would need to be addressed by fixing the link or removing it.

6.4.2 What aspects of the landing page grab the most attention?

Eye tracking was started immediately upon their arrival to the landing page to try to identify the most visually engaging feature about the landing page. During the first five seconds of viewing the website, the results of a fixation count heat map show that most attention was paid to the large family image that takes up a large portion of the screen. This is not particularly surprising given the size and saliency of the image, but it also is not that helpful to the respondent as the image itself does not contain any information. Again, had the green “Respond to Survey” button been visible during testing it could have garnered more initial attention and directed our participants where we want them to go.

6.4.3 What are the viewer’s feelings when seeing the landing page?

Responses to probe questions made it clear that many participants had a positive first impression of the Census landing page. There were no negative comments recorded. In general, it was found to be friendly, clean and not cluttered, and attractive.

6.4.4 What do they think the purpose of the landing page is?

Responses to a probe question found that participants either thought the landing page was the Census homepage, a site for advertising or to respond to Census surveys, or both.

6.4.5 What is the self-reported likelihood of trying to complete the survey from the landing page?

In order to assess the likelihood of participants trying to complete the survey from the landing page, we simply observed their behavior when they initially arrived at the landing page. Of the nine participants, three decided to try to find the ACS survey. The think aloud feedback coincided with the observed behavior confirming that this was indeed the purpose of their actions as they navigated to the ACS survey.

6.4.6 *Can they find the survey off the landing page? And if not, what are the problems navigating to the survey.*

The remaining six participants who did not try to find the ACS on their own were explicitly asked to do so. This allowed us to determine whether respondents will have trouble finding the ACS online survey if it is their intention to complete the survey. Out of the nine participants, eight were able to complete this task relatively quickly and easily. This is a very high success rate especially despite the main “Respond to a Survey” green button link being below the fold and the inactive “Respond to a Survey” link.

6.4.7 *Does the landing page design improve the viewer’s opinion of the Census Bureau and their self-reported willingness to complete the ACS?*

The ratings for opinion of the Census Bureau or the ratings for willingness to complete a Census survey did not change from their baseline ratings following interaction with the redesigned Census landing page.

7 Summary

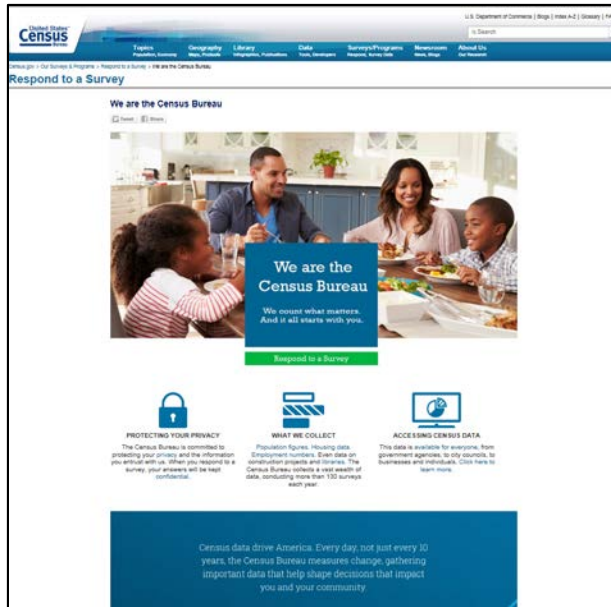
Between the abundance of self-reported positive first impressions, the effectiveness of the digital video advertisement in getting two participants to the Census landing page, and the lack of any decreases in opinion or willingness, this study suggests that video advertisements may be beneficial to increasing response rates with little, if any, negative impact. The Census landing page had some design issues, namely the call to action, which was below the fold, and the inactive link. However, the deliberate design of this landing page to include salient links that route respondents to the survey resulted in easy navigation to the ACS survey and sometimes even elicited this behavior without respondents being instructed to do so. Overall, the results of this research suggest that directing digital video advertisements towards sampled households and designing a landing page with easy navigation to surveys may improve survey response rates.

8 References

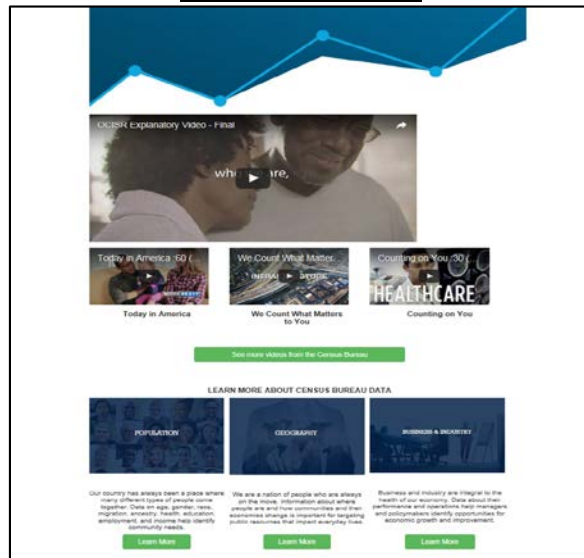
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Appendix A – Images of the redesigned Census landing page

Top of page



Middle of the page



Bottom of the page



Appendix B – Opinion and Willingness Questionnaire

A1. What is your overall opinion of the U.S. Census Bureau?

Very favorable Very unfavorable

A2. How willing would you be to complete a survey from the U.S. Census Bureau?

Very willing Very unwilling

B1. What is your overall opinion of the U.S. Census Bureau?

Very favorable Very unfavorable

B2. How willing would you be to complete a survey from the U.S. Census Bureau?

Very willing Very unwilling

C1. What is your overall opinion of the U.S. Census Bureau?

Very favorable Very unfavorable

C2. How willing would you be to complete a survey from the U.S. Census Bureau?

Very willing Very unwilling

D1. What is your overall opinion of the U.S. Census Bureau?

Very favorable Very unfavorable

D2. How willing would you be to complete a survey from the U.S. Census Bureau?

Very willing Very unwilling

E1. What is your overall opinion of the U.S. Census Bureau?

Very favorable Very unfavorable

E2. How willing would you be to complete a survey from the U.S. Census Bureau?

Very willing Very unwilling

Appendix C – Protocol

Thank you for your time today. My name is XX and I work with the Human Factors and Usability group at the Census Bureau. I will be working with you today. In this lab, we evaluate how easy or difficult Census products are to use. What works well, we keep. When potential users, such as you, have difficulty with something, we have an opportunity to fix it before it goes live to a much larger group.

Before we start, there is a form I would like you to read and sign. It explains the purpose of today's session and your rights as a participant. It also informs you that we would like to take a video recording of you and the screen and record the audio from this session to get an accurate record of your feedback. Only those of us connected with the project will review the recording and it will be used solely for research purposes. Your name will not be associated with the recording or any of the other data collected during the session.

[Hand consent form; give time to read and sign; sign own name and date]

[Start Camtasia Recording!]

Thank you.

We have a variety of different tasks we will have you do today, some on paper, and some online. There are no right or wrong answers and you should feel free to give your honest opinions. I did not create any of these products or content, so do not feel like you have to hold back on your thoughts to be polite to me. We appreciate your help so we can make our U.S. Census products and services work well for everyone.

The first task is for you to answer these two questions.

[Hand participant baseline-opinion/willingness survey]

[Wait for participant to finish]

- Can you tell me in your own words why you rated your opinion of the U.S. Census Bureau the way you did?

The next task is for you to complete a short demographic questionnaire. *[Have participant complete demographic survey]*

Thanks.

For the next task, I would like you to think aloud as you interact the materials I give you. I am interested in not only your actions but also the process you go through in your mind when you interact with the materials. I would like you to tell me everything that you are thinking and feeling during that time.

Practice: This is not a very natural behavior for most people so let's do a practice session now. Starting now, please think aloud as you answer the question, how many windows are in your home?

[Wait for participant to finish]

Great that's what I want you to do when I tell you to think aloud.

MAILING MATERIALS SECTION

[Hand participant the mailing materials]

This is an example of mailing materials you would receive at your home if you were selected for the 2017 American Community Survey. Notice that the address is not your real address. If you were to receive the survey at your home, the mailing materials you would get would have your address. Since we cannot replicate that for the lab setting, you will have to pretend that this letter came to your address and that the address displayed is your own. Please think aloud as you interact with these materials.

[Wait for participant to finish]

- What would you do if you received these mailing materials at your home address?
- Does anything stand out to you in the materials?

[Hand participant post-mailing materials opinion/willingness survey]

Please take a moment to answer these two questions.

[Wait for participant to finish]

- Can you tell me in your own words why you rated your opinion of the U.S. Census Bureau the way you did?

For the next part you will be helping us evaluate some digital media and website content from the U.S. Census Bureau.

We are going to record where you look on the screen. Now we will do a simple task that will allow the computer to find your eyes. To calibrate the eye-tracking system, please follow the red dot with your eyes.

- *[Calibrate the participants' eyes. Do not begin eye-tracking yet. Start the recording later for the landing page section, which will also launch the landing page]*

VIDEO ADVERTISEMENT SECTION

Next, you're going to watch a short online video. Let me know when you're ready to begin.

[Bring up Census video advertisement]

[When participant is ready, play the video ad]

- What is your impression of this video advertisement?
- Do you have any additional comments or opinions about this advertisement?
- If you saw this ad while going about your typical online activities, what would you do?
- Finally, have you ever personally used the website youtube?
 - If “Yes” – Ask: In youtube there is a skip ad option after the first few seconds that the video plays. Do you typically skip video advertisements?
 - If “No” – Ask: Would you skip video advertisements if given that option?

[Hand participant post-advertisement opinion/willingness survey (C)]

Please take a moment to answer these two questions.

[Wait for participant to finish]

- Can you tell me in your own words why you rated your opinion of the U.S. Census Bureau the way you did?

LANDING PAGE SECTION

Great, let's continue. In this part of the session, I also want you to think aloud again as you interact with a webpage. Pretend you have just arrived to this website.

[Start eye-tracking recording, which will bring up Version A of the landing page]

[After a few minutes of interacting with webpage OR if participant does not start interacting with webpage and looks to TA, continue]

- **[Ask only if they did not explore on their own, otherwise skip]:** Please take a moment to interact and explore the website starting from this webpage.

[Hit F10 and start preview mode]

[Record whether participant attempted to find ACS survey.]

[Return participant to main landing page]

- What is your first impression of this webpage?
- What do you think the purpose of this landing page is?
- Do you have any other comments or opinions about this webpage?

[Hand participant post-advertisement opinion/willingness survey]

Please take a moment to answer these two questions.

[Wait for participant to finish]

- Can you tell me in your own words why you rated your opinion of the U.S. Census Bureau the way you did?

[If participant spontaneously found ACS in Step #5 skip this step, otherwise say:

[Start Eye-tracking recording part 2)

- Pretend that you wanted to respond to the American Community Survey. Starting from this page, find the American Community Survey. You may navigate off the page.

[Record if they were successful finding ACS survey]

[Hand participant post-ACS search opinion/willingness survey (E)]

Please take a moment to answer these two questions.

That is all for this experiment. Thank you so much for your time and effort!

Appendix D – Probe Questions

Mailing Materials:

- What would you do if you received these mailing materials at your home address?
- Does anything stand out to you in the materials?

Digital Video Advertisement:

- What is your impression of this video advertisement?
- Do you have any additional comments or opinions about this advertisement?
- If you saw this ad while going about your typical online activities, what would you do?
- Have you ever personally used the website YouTube?
 - If **“Yes”** – Ask: In YouTube there is a skip ad option after the first few seconds that the video plays. Do you typically skip video advertisements?
 - If **“No”** – Ask: Would you skip video advertisements if given that option?

Census Landing Page:

- What is your first impression of this webpage?
- What do you think the purpose of this landing page is?
- Do you have any other comments or opinions about this webpage?