

Linear Navigation Guideline

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Federal Committee on Statistical Methodology

October 27, 2022

Sample of Census Bureau questionnaires

American Community Survey - left

United States[™]
Census
Bureau

American Community Survey

Instructions FAQs Save and Log Out

17 Is this mobile home —
([Help](#))

☐ Owned by you or someone in this household with a mortgage or loan? *Include home equity loans.*

☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?

☐ Rented?

☐ Occupied without payment of rent?

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Where You Are

Basic Info

Housing Questions

Person Info

Contact Us Accessibility Privacy Security

Sample of Census Bureau questionnaires

Business Survey - middle

3. Of the \$0,000.00 reported above, what was the first quarter payroll at this establishment before deductions (January-March 2022)? ☐ \$,000.00

D. Employer's Annual Cost for Fringe Benefits

1. What were the legally required fringe benefits? (Include employer payments for Social Security, Medicare, unemployment compensation, workmen's compensation, and State disability programs, if required.) ☐ Check if None 2022 \$,000.00

2. What were the voluntarily provided fringe benefits? (Include such items as payments for life insurance, medical insurance, pensions, welfare benefits, and union-negotiated benefits.) ☐ \$,000.00

TOTAL (Add lines D1 and D2.) ☐ \$,000.00

Sample of Census Bureau questionnaires

2020 Census - right

United States Census 2020

FAQ INSTRUCTIONS ENGLISH

Address Verification Household Questions People Questions Final Questions

On April 1, 2020, was the house, apartment, or mobile home at 4600 SILVER HILL ROAD - (Help)

☐ Owned by you or someone in this household with a mortgage or loan (including home equity loans)?

☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?

☐ Rented?

☐ Occupied without payment of rent?

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Literature

- Placement of forward and backward navigation did not affect breakoff rates – Couper, Baker, & Mechling (2011)
- Placement of forward button to the right of the backward button increases user satisfaction and is preferred with no time-on-task differences noted – Romano Bergstrom, Erdman, & Lakhe (2016)

Web survey design issue

- For forward and backward navigation buttons we needed to know the optimal:
 - Placement
 - Color
 - Size
 - Label

User Experience Design Factors

- Mental models = how the user expects the design to work
 - Typically based on what the user knows from past experiences
- Fitts' law = is about how time on task is affected by size and distance
 - Bigger and closer targets take less time to engage
- Challenge: We suspected that time on task would be affected by the content of the survey questions we asked. We wanted to take that “cognitive factor” out of the equation.

Method

- Series of A/B experiments using nonprobability panels
 - Reside in the U.S. and opted in to participate in studies.
 - 400 participants in Experiment 1
 - 39% Male/61% Female
 - Age (mean=47 years old; range 18-88)
 - 5% Hispanic origin/95% not of Hispanic origin
 - 77% White only/23% nonwhite only
 - 16.5% High school or less/83.5% more than high school
 - 30% Mobile/ 70% PC
 - 515 participants in Experiment 2 confirmation experiment
 - PC/Mac only
 - Similar breakdowns but more High School or less
 - 34% High school or less / 66% more than high school

Placement experiment

4 navigation button placements & 3 questions
12 screens altogether

Centered with the radio button question

United States Census Bureau

Please select Yes below.

☒ Yes

☐ No

Two dark blue navigation buttons are centered at the bottom of the screen, circled in red.

Either side with the dropdown question

United States Census Bureau

Please select Alaska from the list below.

Alaska

Two dark blue navigation buttons are positioned on either side of the bottom of the screen, circled in red.

Right-aligned buttons with the text entry question

United States Census Bureau

Please enter the name Jane Doe.

First Name Jane

Last Name Doe

Two dark blue navigation buttons are right-aligned at the bottom of the screen, circled in red.

Left-aligned buttons

United States Census Bureau

Please enter the name Jane Doe.

First Name Jane

Last Name Doe

Two dark blue navigation buttons are left-aligned at the bottom of the screen, circled in red.

How we tried to remove the “cognitive factor” from the questions and uncover the user’s mental model

United States Census Bureau

Please select Yes below.

☒ Yes

☐ No

Two dark blue rectangular buttons are located at the bottom of the form.

United States Census Bureau

Please select Alaska from the list below.

Alaska

Two dark blue rectangular buttons are located at the bottom of the form.

United States Census Bureau

Please enter the name Jane Doe.

First Name Jane

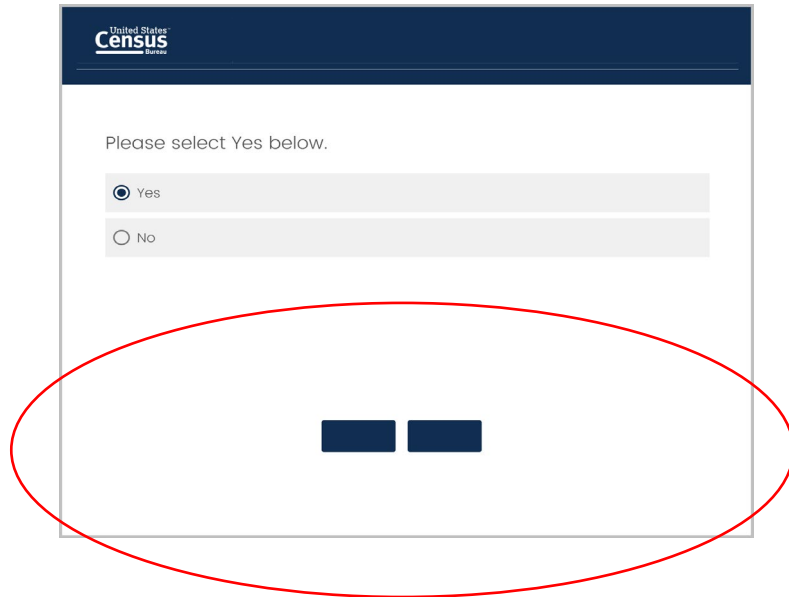
Last Name Doe

Two dark blue rectangular buttons are located at the bottom of the form.

UX Placement winner

Faster selection

Centered



United States Census Bureau

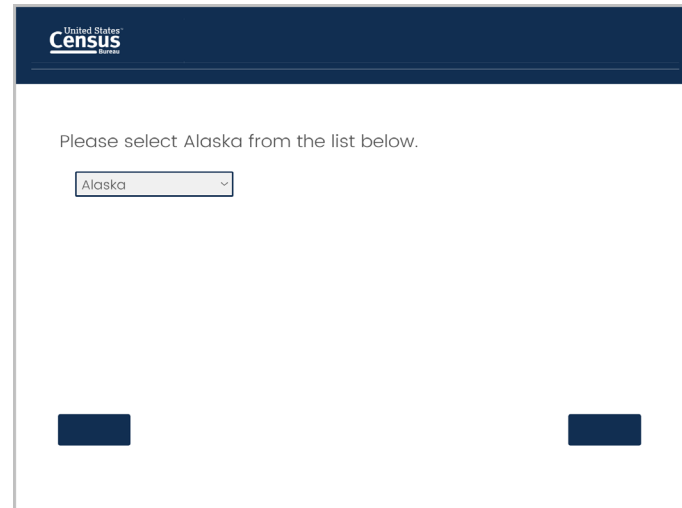
Please select Yes below.

☒ Yes

☐ No

Two dark blue rectangular buttons are centered at the bottom of the form. A red oval is drawn around these buttons.

Either side



United States Census Bureau

Please select Alaska from the list below.

Alaska

Two dark blue rectangular buttons are positioned on the left and right sides of the form, below the dropdown menu.

Other notes:

Over 97% of participants selected the button on the right to go forward.

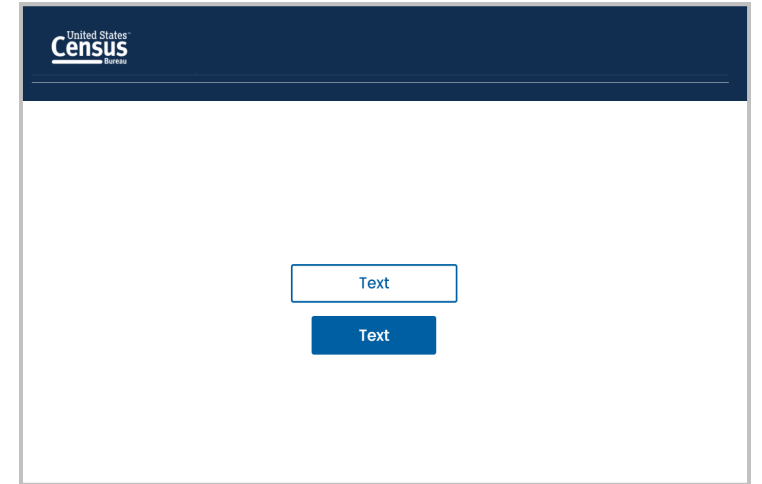
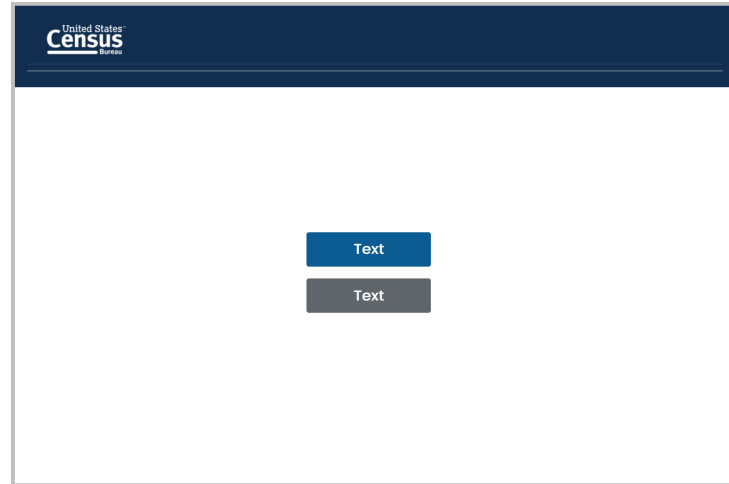
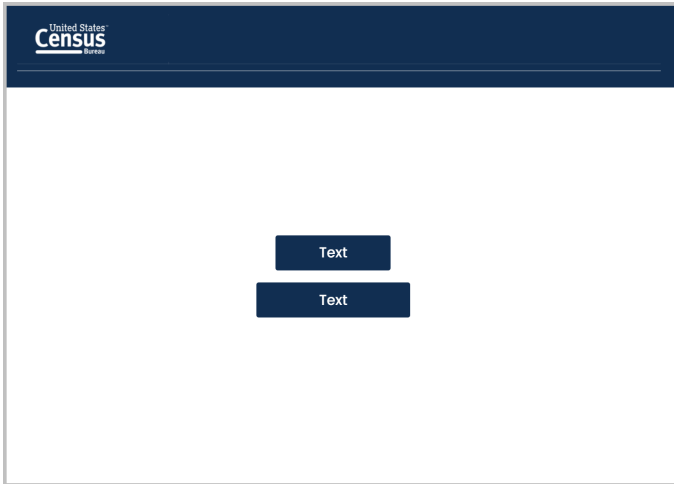
Participants preferred the either side navigation buttons.

Participants preferred buttons closer to the question. This matches Fitts' law.

The centered buttons could be the same in larger and smaller devices so we went with that design with forward navigation on the right and backwards navigation on the left.

Color and size experiment

15 screens altogether



UX Color and size selection

There was not a clear UX winner; but there were less usable designs.

Do not:

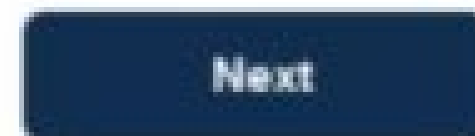
Make the Previous button bigger than the Next button



Make the Previous button blue when the Next button is white



Use same sized buttons if the buttons are the same color

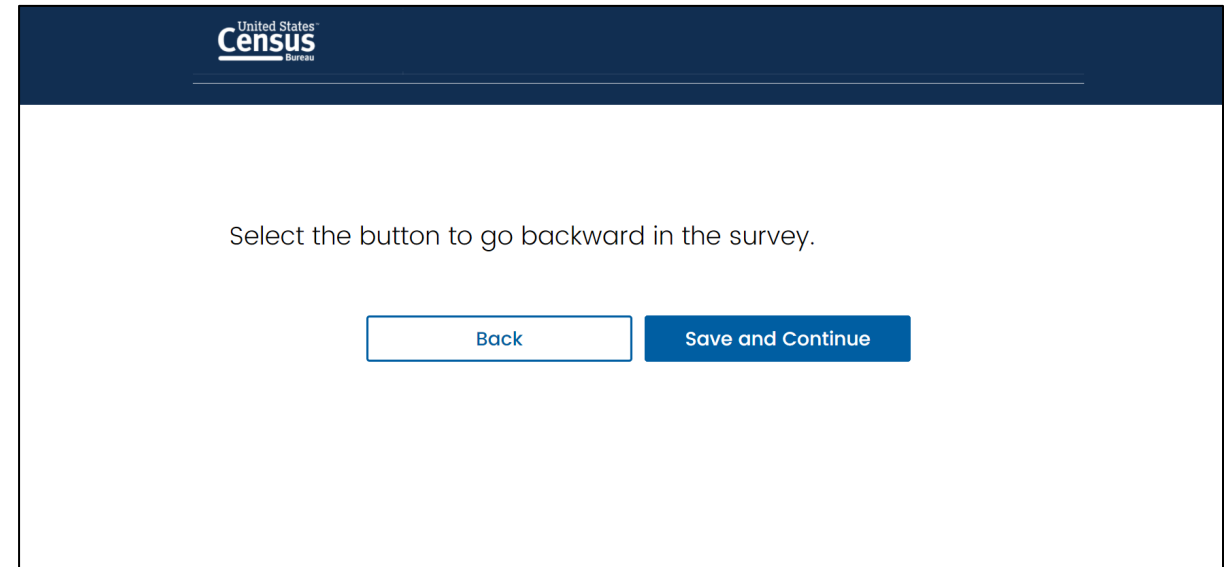
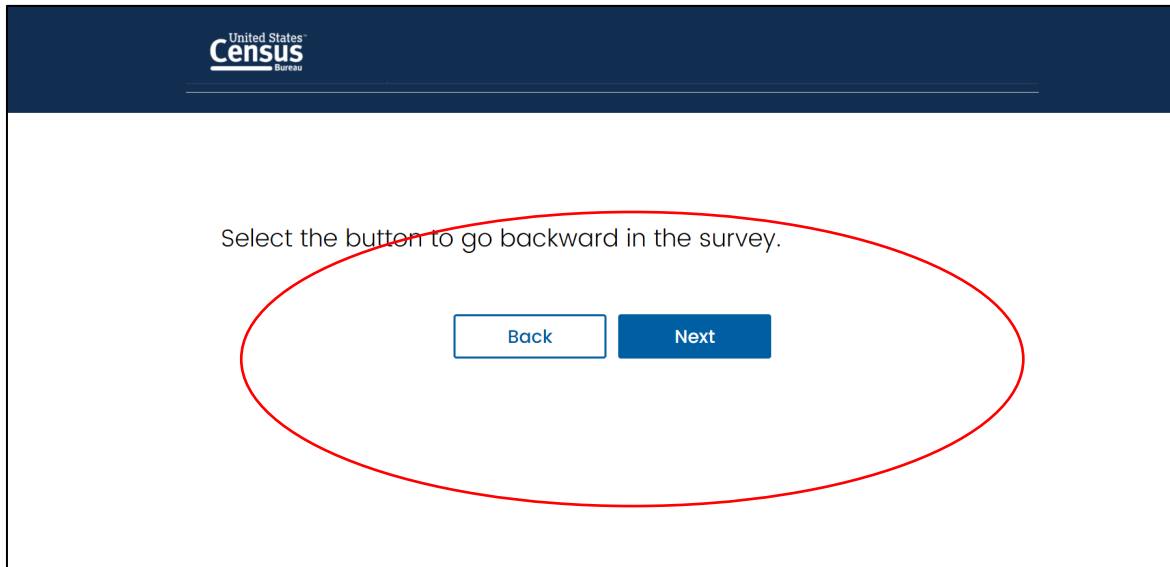


Confirmation experiment

Color, label and size

Measured time-on-task and accuracy of button selected

Showed 32 of 64 combinations - randomized



Guideline

- White and Colored button to match the branding of the survey
- Centered
- Default labels of Next and Back with the ability to choose an alternative or to add arrows in addition to text

Challenges & Compromise

- Small differences or no differences in time and accuracy once labeling and colors were in place
- Survey area stakeholders had strong opinions on labels
 - Compromise to include default labels but then allow for alternatives

Thank you!

Elizabeth Nichols

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Designing Edit Validations

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Federal Committee on Statistical Methodology

October 27, 2022



This presentation is released to inform interested parties of research and to encourage discussion.
The views expressed are those of the authors and not those of the U.S. Census Bureau.
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Background

- Edits/validations are programmed into web surveys to catch possible errors or inconsistencies in the data
- The validations are triggered once the respondent attempts to leave the survey page and navigate to another page
- If an edit/validation is triggered, a message appears to the respondent alerting them to the issue
- Edits/validations are typically used to
 - remind respondents of missing answers
 - compare the answers to different questions
 - signal that an answer is out of range

Types of data entry errors

- Hard edits
 - Prevent respondent from answering more survey questions or submitting data
 - E.g., entering an address for the 2020 Census
- Soft edits
 - Do not prevent respondent from answering more survey questions or submitting data without changing responses
 - E.g., inconsistent age and date of birth

Design questions

- How should these alerts appear?
- Length of alert message?
- Placement/location?
- Color?
 - Different for each type of alert (e.g., soft vs. hard)?

2014 Census Test

- Usability testing of census online instrument
- Think aloud protocol
- Tested three edit messages for the race/Hispanic origin item

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2014 Census Test

Instructions FAQs Logout

Please provide a specific response in the space below. If this person does not identify with a specific origin, use the "Next" button to continue.

You said that Jane Doe is:

White
Hispanic, Latino, or Spanish
Black or African Am.

Next, we will collect detailed information for each race or origin listed above.

What is Jane Doe's **WHITE** origin? — Enter origin(s), for example, German, Irish, English, Italian, Lebanese, Egyptian, and so on.
(Help)

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2014 Census Test

Instructions FAQs Logout

Please provide a specific response in the space(s) below the checked box(es). If this person does not identify with a specific origin, use the "Next" button to continue.

What is Jane Doe's race or origin? Select one or more boxes **AND** enter the specific race(s) or origin(s). (Help)

☒ White — Enter origin(s), for example, German, Irish, English, Italian, Lebanese, Egyptian, and so on.
[Text Box]

☒ Hispanic, Latino, or Spanish origin — Enter origin(s), for example, Mexican or Mexican American, Puerto Rican, Cuban, Dominican, Salvadoran, Colombian, and so on.
[Text Box]

☒ Black or African Am. — Enter origin(s), for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, and so on.
[Text Box]

☐ Asian — Enter origin(s), for example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, Japanese, and so on.
[Text Box]

☐ American Indian or Alaska Native — Enter name of enrolled or principal tribe(s), for example, Navajo Nation, Blackfeet Tribe, Muscogee (Creek) Nation, Mayan, Doan, Native Village of Barrow Inupiat Traditional Government, and so on.
[Text Box]

☐ Native Hawaiian or Other Pacific Islander — Enter origin(s), for example, Native Hawaiian, Samoan, Guamanian or Chamorro, Tongan, Fijian, Marshallese, and so on.
[Text Box]

☐ Some other race or origin — Enter race(s) or origin(s).
[Text Box]

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2014 Census Test

Instructions FAQs Logout

Please provide a specific response in the space(s) below the checked box(es).

What is Jane Doe's race or origin? Select one or more boxes **AND** enter the specific race(s) or origin(s). (Help)

☒ White — Enter origin(s), for example, German, Irish, English, Italian, Lebanese, Egyptian, and so on.
[Text Box]

☒ Hispanic, Latino, or Spanish origin — Enter origin(s), for example, Mexican or Mexican American, Puerto Rican, Cuban, Dominican, Salvadoran, Colombian, and so on.
[Text Box]

☒ Black or African Am. — Enter origin(s), for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, and so on.
[Text Box]

☐ Asian — Enter origin(s), for example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, Japanese, and so on.
[Text Box]

☐ American Indian or Alaska Native — Enter name of enrolled or principal tribe(s), for example, Navajo Nation, Blackfeet Tribe, Muscogee (Creek) Nation, Mayan, Doan, Native Village of Barrow Inupiat Traditional Government, and so on.
[Text Box]

☐ Native Hawaiian or Other Pacific Islander — Enter origin(s), for example, Native Hawaiian, Samoan, Guamanian or Chamorro, Tongan, Fijian, Marshallese, and so on.
[Text Box]

☐ Some other race or origin — Enter race(s) or origin(s).
[Text Box]

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Findings

- Race edits were not noticed when activated
 - Very few race edits were invoked during the actual sessions
- No pattern with one type of edit message helping more than another edit message
- During the debriefing these edits even caused some confusion

Findings

Content and color

- Long messages can be ignored, particularly in green
- Conflicting content/color “Red tells you that you skipped something, but message says it’s OK to go on”

Color

- Green
 - Ignore
 - Positive
 - Not an error
- Red
 - Alerts user that there’s an issue
 - Made an error

2016 Census Test

- Green message (soft) and red outline
- Participants do not pick on nuance of soft vs. hard

The screenshot displays the 2016 Census Test interface. At the top, there is a blue header with the 'Census' logo and navigation links. Below the header, a green message box contains the text: 'Please provide an age as of April 1, 2016. If you do not know it, provide what you know. Your entry is confidential as of April 1, 2016. Estimated'. To the left of this message box is a vertical age selector with a red outline. Below the message box, there is a 'Month' dropdown menu with a red outline and a 'Year' dropdown menu with a red outline. The 'Month' dropdown is currently set to 'May' and the 'Year' dropdown is currently set to '1998'. Below these dropdowns, there is a text input field for 'Verify or enter age year old, do not use' and a 'Next' button. At the bottom of the page, there is a footer with the text 'Built: 10/10/16 | 100% | Approval Expires: 10/1/2016' and links for 'Accessibility | Privacy | Security'.

2020 Census: Soft edits

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Census 2020

Address Verification Household Questions

Home > Sex > Age > Hispanic Origin > Race

Please provide a response. If this person does not have an answer, continue to the next page.

What is S S S's race? (Help)

Select one or more boxes **AND** enter origins. For this census, Hispanic origins are not races.

☒ White
Enter, for example, German, Irish, English, Italian, Lebanese, Egyptian, etc.

☐ Black or African American
Enter, for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, etc.

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Address Verification Household Questions People Questions

Please provide an answer to the question.

Do you have a Rural Route address? (Help)

☐ Yes
☐ No


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2020 Census: Hard edit

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United States Census 2020

FAQ INSTRUCTIONS  ENGLISH ▼

Address Verification Household Questions People Questions Final Questions

Please provide your full address.

Where were you living on April 1, 2020? [\(Help\)](#)

Please provide a complete street address for your residence. Provide the street address you would use to have a package delivered directly to your residence, not a rural route or P.O. Box address used for mailing purposes. A street address is the most helpful for processing your response.

Address Number <i>Ex: 101</i>	Street Name <i>Ex: N Main St</i>	Apt/Unit <i>Ex: Apt 23</i>
<input type="text"/>	<input type="text"/>	<input type="text"/>
City	State	ZIP Code
<input type="text"/>	<input type="text"/>	<input type="text"/>

☐ I do not have a street address

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Challenges & Compromise

- Functionality of messages present programming challenges
 - Difficult to test experimentally
 - Have been unable to design and test edit messages due to software limitations
- Rely on United States Web Design System (USWDS) guidance
<https://designsystem.digital.gov/components/alert>
- More research will occur on this topic in FY23 using the American Community Survey panel

USWDS



Informative status

Lorem ipsum dolor sit amet, [consectetur adipiscing](#) elit, sed do eiusmod.



Warning status

Lorem ipsum dolor sit amet, [consectetur adipiscing](#) elit, sed do eiusmod.



Error status

Lorem ipsum dolor sit amet, [consectetur adipiscing](#) elit, sed do eiusmod.



Success status

Lorem ipsum dolor sit amet, [consectetur adipiscing](#) elit, sed do eiusmod.

SLIM ALERT



Lorem ipsum dolor sit amet, [consectetur adipiscing](#) elit, sed do eiusmod.

ALERT WITH NO ICON

Lorem ipsum dolor sit amet, [consectetur adipiscing](#) elit, sed do eiusmod.

Guidelines

Hard edits (error)

- Messages should appear with **red** background color
 - Use sparingly
 - Only for information survey needs to allow respondent to continue

This is an example of a hard edit or error alert.

#F4E3DB

#D54309

Soft edits (warning)

- Messages should appear with **yellow** background color

This is an example of a soft edit or warning alert.

#FAF3D1

#BA8C3D

Guidelines

Informational alert

- Informational messages should appear with **blue** background color
 - Informational messages are rare within surveys

This is an example of an informational alert.

#E7F6F8

#00A1C2

Success alert

- Messages should appear with **green** background color
 - These are rare within surveys

This is an example of a success alert.

#ECF3EC

#00A91C

Guidelines

- The alert message is at the top of the survey screen
- Outline the corresponding Dropdowns, Combo boxes, and write-in fields in the same color

Please provide your full address.

Where were you living on April 1, 2020? ([Help](#))

Please provide a complete street address for your residence. Provide the street address you would use to have a package delivered directly to your residence, not a rural route or P.O. Box address used for mailing purposes. A street address is the most helpful for processing your response.

Address Number <i>Ex: 101</i>	Street Name <i>Ex: N Main St</i>	Apt/Unit <i>Ex: Apt 23</i>
<input type="text"/>	<input type="text"/>	<input type="text"/>
City	State	ZIP Code
<input type="text"/>	<input type="text"/>	<input type="text"/>

☐ I do not have a street address

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Challenges & Compromise

- The alert is the message that appears when a validation/edit is triggered
- Information messaging that needs to be communicated to the respondent
- Software limitations prevented systematic design testing (e.g., of color and placement of alert)
- Rely on USWDS guidance
- More research on edit validations ahead in FY23

Thank you!

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Web Survey Branding

Jonathan Katz

Center for Behavioral Science Methods, U.S. Census Bureau

Federal Committee on Statistical Methodology

October 27, 2022

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English Español Save and Logout

What is the highest degree or level of school you have completed?
Select only one answer.

- ☐ No high school
- ☐ Some high school
- ☐ High school graduate or equivalent (for example GED)
- ☐ Some college, but degree not received or is in progress
- ☐ Associate degree (for example AA, AS)
- ☐ Bachelor's degree (for example BA, BS, AB)
- ☐ Graduate degree (for example master's, professional, doctorate)

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Banner

Wrapper

Footer

Examples of wrappers used in surveys



Goals

- Wanted to create a uniform look-and-feel for all survey wrappers.
- With the help of Public Information Office, designed survey wrappers to embed in testing that would inform guidelines
- Research Questions:
 1. Where did users expect these select survey features to be located?
 2. What did users think of redesigned survey wrappers?

Methods

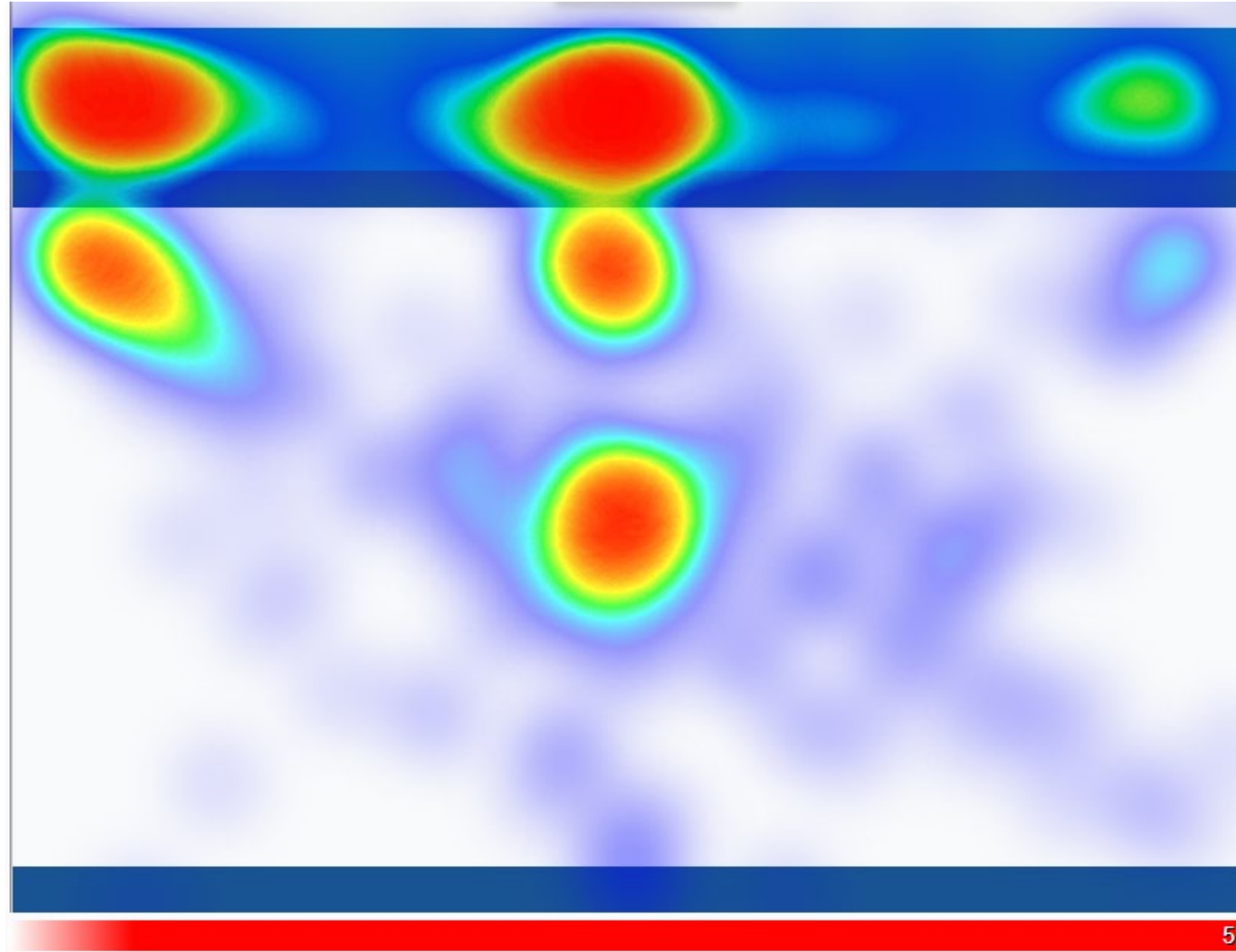
- Conducted unmoderated testing in Qualtrics
- Series of A/B experiments using nonprobability panels
 - 795 participants
 - 38% Male/62% Female
 - Age (mean=46 years old; range 14-90)
 - 12% Hispanic origin/88% not of Hispanic origin
 - 74% White only/26% nonwhite only
 - 43% High school or less/57% more than high school
 - 30% Mobile/ 70% PC

Where did users expect these survey features to be located?

1. Logo of the survey sponsor
2. Name of the survey
3. Contact us
4. Frequently asked questions (FAQ)
5. Language toggle

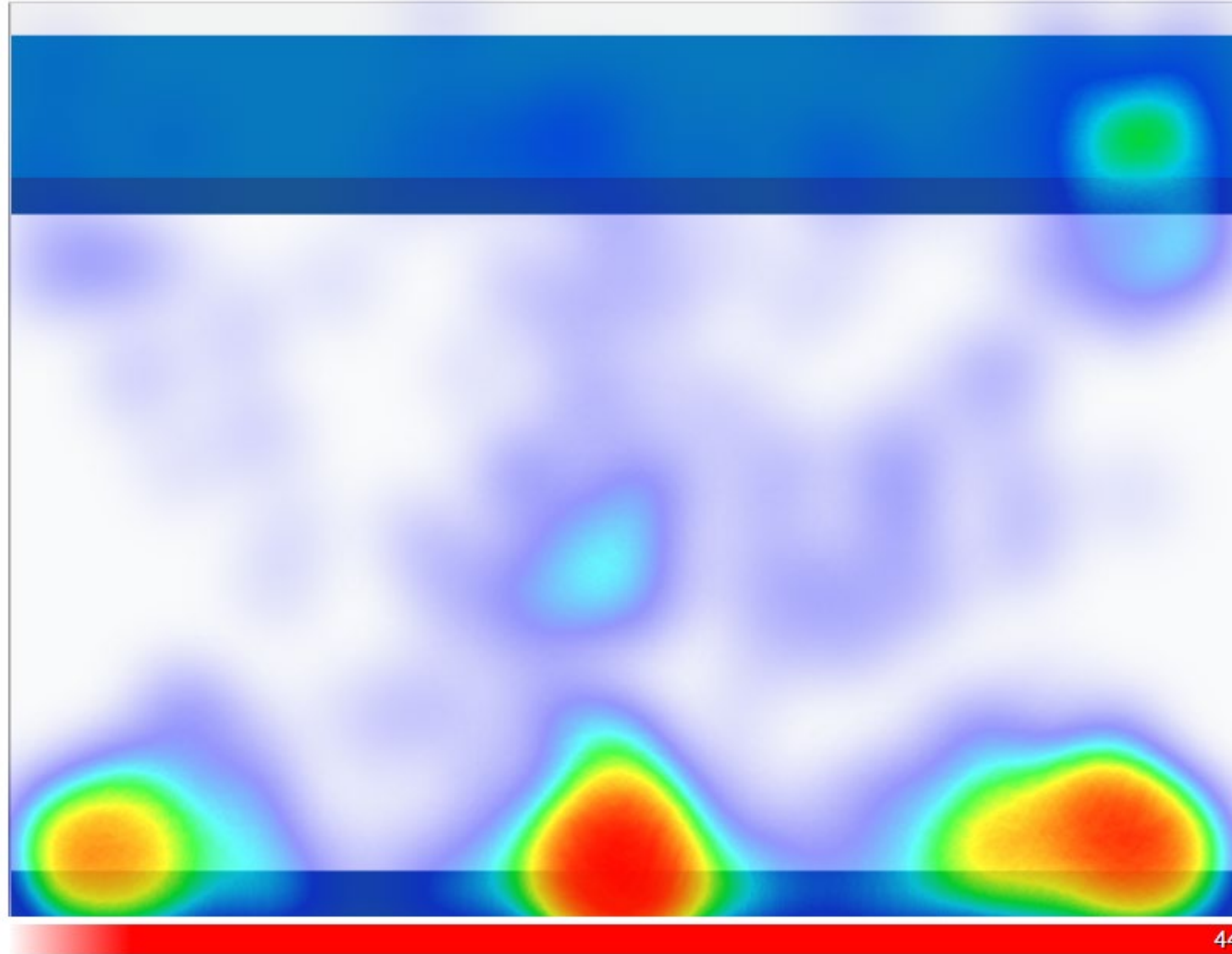
- “Typically, surveys have the logo of the survey sponsor. Where do you expect to see that logo on the page? (Click or touch the image.)”

Heat map results: Where do you expect to see that logo on the page?

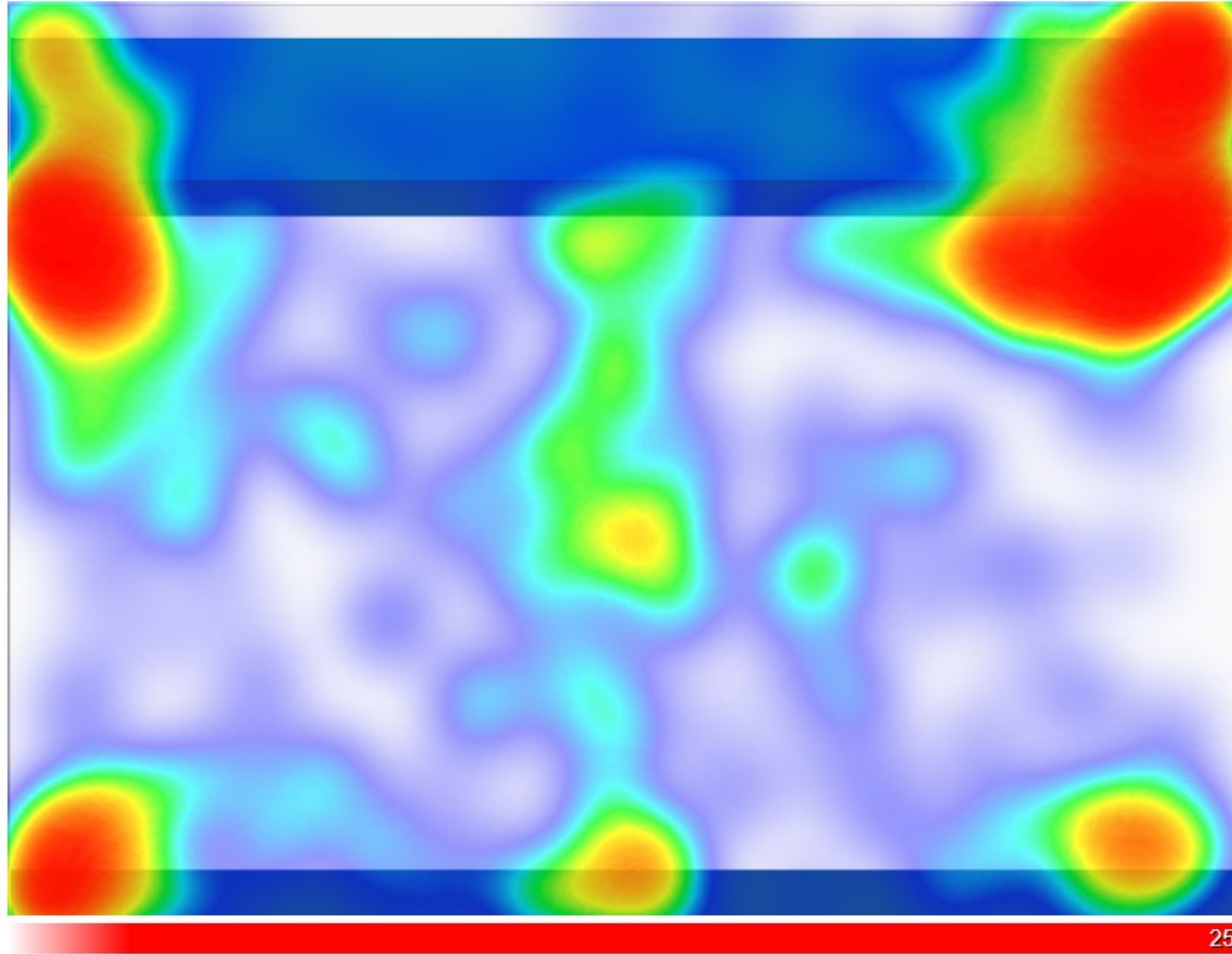


*The dark red signifies the most frequently clicked (or touched, if mobile) area

Results: Where would you expect to find a Contact us link?



Results: Where would you look for the language toggle feature?



What did users think of redesigned survey wrappers?

Census Planning Survey

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**United States[™]
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What is the highest degree or level of school you have completed?
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Redesign 1 – People Design

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 **2020 Census Planning Survey**


[FAQs](#) [Español](#) [Save and Log Out](#)

What is the highest degree or level of school you have completed?
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- ☐ Some college, but degree not received or is in progress
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- ☐ Bachelor's degree (for example BA, BS, AB)
- ☐ Graduate degree (for example master's, professional, doctorate)

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Redesign 2 – Logo Only Design

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2020 Census Planning Survey



FAQs Español Save and Log Out

What is the highest degree or level of school you have completed?
Select only one answer.

- ☐ No high school
- ☐ Some high school
- ☐ High school graduate or equivalent (for example GED)
- ☐ Some college, but degree not received or is in progress
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- ☐ Bachelor's degree (for example BA, BS, AB)
- ☐ Graduate degree (for example master's, professional, doctorate)

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Question 1: Which redesign did participants prefer?

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United States[®] Census Bureau 2020 Census Planning Survey

FAQs Español Save and Log Out

What is the highest degree or level of school you have completed?
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- ☐ Bachelor's degree (for example BA, BS, AB)
- ☐ Graduate degree (for example master's, professional, doctorate)

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OR

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2020 Census Planning Survey **United States[®] Census Bureau**

FAQs Español Save and Log Out

What is the highest degree or level of school you have completed?
Select only one answer.

- ☐ No high school
- ☐ Some high school
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- ☐ Graduate degree (for example master's, professional, doctorate)

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Question 2: Did they prefer the chosen redesign or the original design?

Preference from Q1
above

OR

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United States[®] Census Bureau 2020 Census Planning Survey

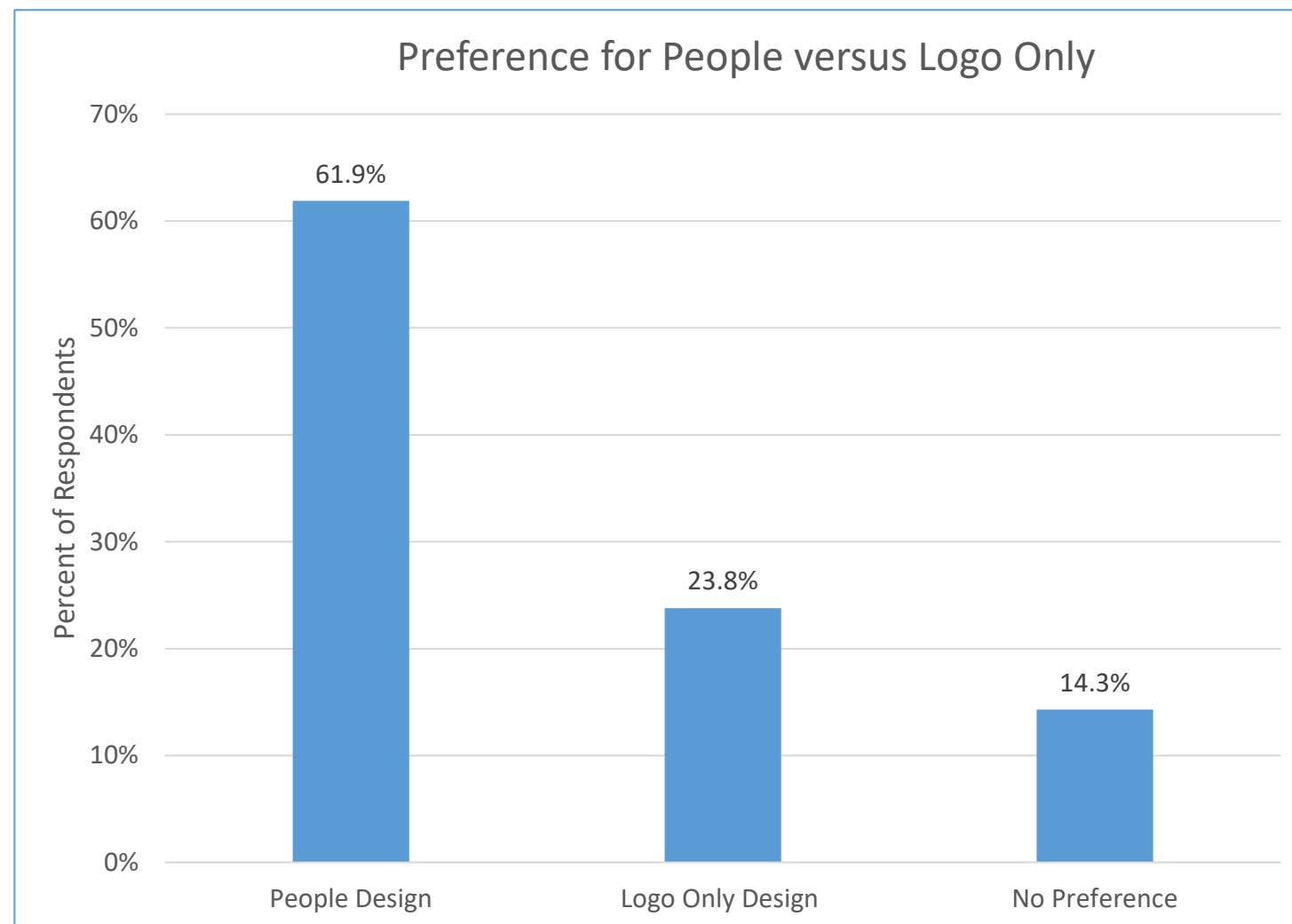
English Español Save and Logout

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- ☐ Associate degree (for example AA, AS)
- ☐ Bachelor's degree (for example BA, BS, AB)
- ☐ Graduate degree (for example master's, professional, doctorate)

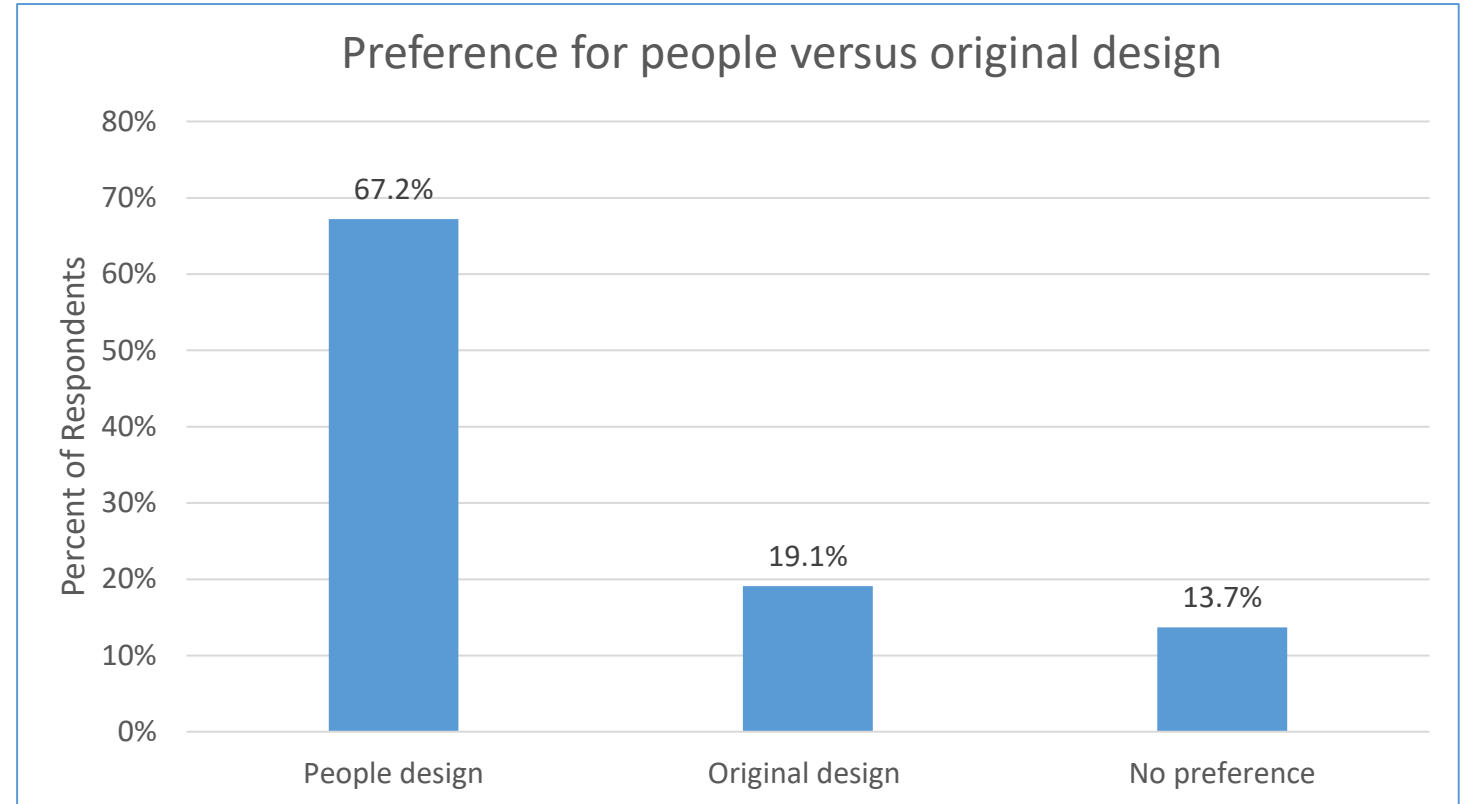
Census Planning Survey Preference (Redesigns)

- Chi-square test between conditions
- $X^2 (2, N = 265) = 100.76$, $p < 0.01$
- Users preferred the people design over the logo only design



Census Planning Survey Preference (People versus Original design)

- Chi-square test between conditions
- $X^2 (2, N = 183) = 95.344, p < 0.01$
- Users preferred the people design over the original design



What did we recommend for the final guideline?



Survey Title

[FAQ](#)

[Español](#)

[Save and Log out](#)

A large, empty rectangular box with a thin gray border, intended for a survey or form content.

Challenges

- Many respondents skipped the questions asking them to click (or touch) where they expected select features.
- Sometimes it was not exactly clear where select survey features should be located on the wrapper
- Does preference for the people images lead to better data quality?

Thank you!

Jonathan Katz

jonathan.m.katz@census.gov

Progress Indicators

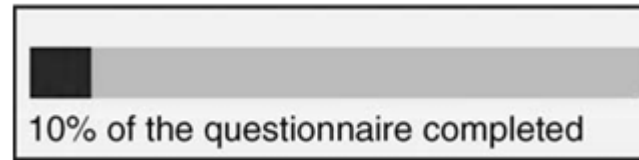
Rachel Horwitz

Demographic Statistical Methods Division, U.S. Census Bureau

Federal Committee on Statistical Methodology

October 27, 2022

What is a progress indicator?



Source: Heerwegh and Loosveldt, 2006

- Visual display to inform respondents how they are progressing through a survey
- Typically displayed across the top, in the top corner or in the bottom corner
- Can provide a percent complete, number of questions (question 2 out of 10), or no textual reference

Why use progress indicators?

- Social exchange theory
 - Respondent agrees to participate and in exchange they receive information on the burden of the survey and how they are progressing (Villar, et al., 2013)
- Keep respondents motivated
 - Respondents may be more likely to complete if they see they are making progress (Villar, et al., 2013)
 - If respondents are feeling fatigue, they may see they are almost finished and complete the survey (Heerwegh and Loosveldt, 2006)

Web survey design issue

- Goal is to set an expectation of time
- Most surveys are not linear
 - Not every respondent sees every question
 - Questionnaire length can vary depending on pathing
- This results in unpredictable progress indicators
 - Static – jump around depending on pathing
 - Dynamic – start the progress slow until paths have been established

Method

- Conducted a literature review to determine effectiveness
 - Google Scholar
 - Conference Proceedings
 - Books
- Sources
 - Experiments
 - Meta-analysis
 - Usability testing
- Experiments date back to 2001

What the research found

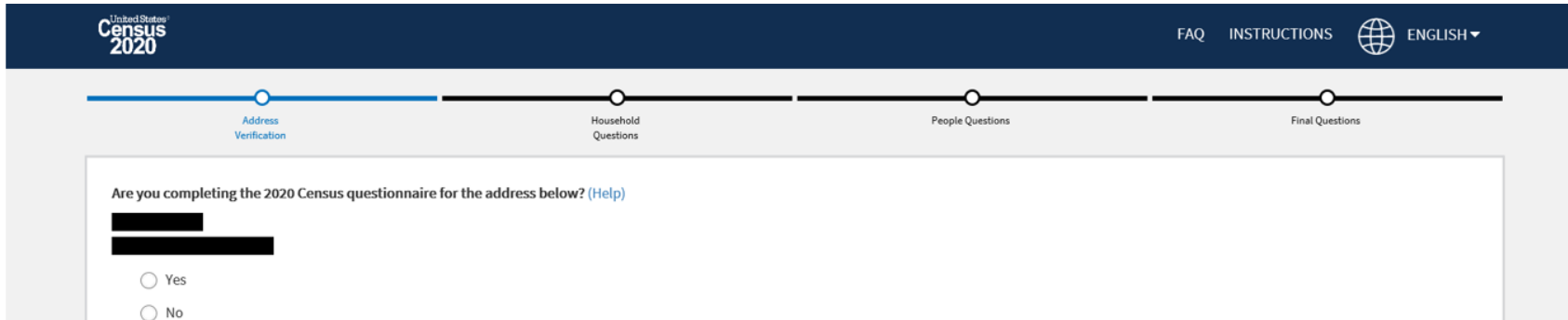
- Progress indicators work when
 - Respondents believe a task will take longer than it actually ends up taking (Yan, et al., 2010)
 - If the survey is promised to be short and is actually short (Yan, et al., 2010)
 - Start off fast but later slow down (Villar, et al., 2013)
- Progress indicators don't work when
 - Respondents don't see early progress (slow to fast) (Villar, et al., 2013; Crawford et al, 2021)
 - They jump around as pathing changes (Kaczmirek, 2008)
- In other cases, there is no effect (Couper et al., 2001; Yan, et al., 2010; Villar et al., 2013; Crawford et al., 2021)

Guideline

- Do not include progress indicators for survey completion status
 - Progress indicators are unlikely to help and may reduce completes

Challenges & Compromise

- Some surveys want a way to communicate expectations
- Solution – section progress indicators
 - Allows respondents know where they are and what's to come
 - Is not influenced by pathing
 - Indicator was not problematic in 2020 Census usability testing (Nichols, et al., 2017; Olmsted-Hawala, 2018; Olmsted-Hawala, et al., 2019; Olmsted-Hawala, et al., 2020)



The screenshot shows the top of the 2020 Census questionnaire interface. At the top, there is a dark blue header with the "United States Census 2020" logo on the left and links for "FAQ", "INSTRUCTIONS", a globe icon, and "ENGLISH" on the right. Below the header is a horizontal progress bar with four segments. The first segment, labeled "Address Verification", is highlighted in blue and contains a white circle. The other three segments, labeled "Household Questions", "People Questions", and "Final Questions", are dark grey and each contain a white circle. Below the progress bar is a white box containing the text "Are you completing the 2020 Census questionnaire for the address below? (Help)". Below this text is a redacted address (two lines of black bars). At the bottom of the box are two radio button options: "Yes" and "No".

Thank you!

Rachel Horwitz

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Personalizing Questions for Online Self-Response Modes: Allowing respondents to enter in timeframes that fits their situation

Erica Olmsted-Hawala

Center for Behavioral Science Methods, U.S. Census Bureau

Federal Committee on Statistical Methodology

October 27, 2022

Income question user issues

- The American Community Survey (ACS) asks the income question over past 12 months
- Timeframe is “annually”
- People may think about the amount of money the earn in a different time period
 - Daily, weekly, monthly,

The screenshot shows the United States Census Bureau's American Community Survey interface. The header includes the Census Bureau logo and the title 'American Community Survey'. Navigation links for 'Instructions', 'FAQs', and 'Save and Log Out' are present. A sidebar on the right titled 'Where You Are' lists 'Basic Info', 'Housing Questions', and 'Person Info', with 'Sample Person' selected under 'Person Info'. The main content area displays question 43: 'The next few questions are about Sample Person's income during the PAST 12 MONTHS.' It provides instructions on reporting income and asks: 'a. Did Sample Person receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS? (Help)'. Radio buttons for 'Yes' (selected) and 'No' are shown. Below, it asks 'What was the amount?' and provides a text input field for the 'TOTAL AMOUNT for past 12 months' with a dollar sign, a text box containing 'Amount', and a decimal field with '.00'. Navigation buttons for 'Previous' and 'Next' are at the bottom. The footer contains links for 'Contact Us', 'Accessibility', 'Privacy', and 'Security'.

United States™
Census
Bureau

American Community Survey

Instructions FAQs Save and Log Out

Where You Are

- Basic Info
- Housing Questions
- Person Info
 - Sample Person
 - Another Person
 - Third Person

43 The next few questions are about Sample Person's income during the PAST 12 MONTHS.

For each type of income Sample Person received, give your best estimate of the TOTAL AMOUNT during the PAST 12 MONTHS. (NOTE: The "past 12 months" is the period from today's date one year ago up through today.)

For income received jointly, report the appropriate share for each person - or, if that's not possible, report the whole amount for only one person and select "No" for the other person.

a. Did Sample Person receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS? [\(Help\)](#)

☒ Yes
☐ No

➔ What was the amount? Report amount from all jobs before any deductions for taxes, bonds, dues, or other items. [\(Help\)](#)

TOTAL AMOUNT for past 12 months

\$ Amount .00

◀ Previous Next ▶

Contact Us Accessibility Privacy Security

43 The next few questions are about Sample Person's income during the PAST 12 MONTHS.

For each type of income Sample Person received, give your best estimate of the TOTAL AMOUNT during the PAST 12 MONTHS. (NOTE: The "past 12 months" is the period from today's date one year ago up through today.)

For income received jointly, report the appropriate share for each person - or, if that's not possible, report the whole amount for only one person and select "No" for the other person.

a. Did Sample Person receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS? ([Help](#))

- ☒ Yes
☐ No

➔ What was the amount? Report amount from all jobs before any deductions for taxes, bonds, dues, or other items. ([Help](#))

TOTAL AMOUNT for past 12 months

\$.00

[< Previous](#)

[Next >](#)

Where You Are

Basic Info

Housing Questions

Person Info

- Sample Person
- Another Person
- Third Person

We noticed in user testing that participants may have been reporting different time frames –

United States™
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Bureau

American Community Survey

Instructions

FAQs

Save and Log Out

14

c. Does anyone in this household pay for water and sewer? [\(Help\)](#)

☒ Yes

☐ No

➔

IN THE PAST 12 MONTHS, what was the cost of water and sewer for this unit? *If you have lived there less than 12 months, estimate the cost.* [\(Help\)](#)

Past 12 months' cost — Dollars

\$

Amount

.00

◀ Previous

Next ▶

Where You Are

Basic Info

Housing Questions

Person Info

Contact Us

Accessibility

Privacy

Security

Example of cost
of water and
sewer in the ACS:
timeframe past
12 months

Expert review of ACS

- The ACS had an expert review done by an outside vendor (contractor) and they recommended harnessing the benefits of online survey design for these types of questions.
- They suggested that if we know the timeframe, we can ask the question that best fits the respondent and may get better data.

- Here is an example of what the contractor recommended...

The image displays two screenshots of a survey interface, illustrating a recommended change to a question about electricity costs for a mobile home.

Top Screenshot (Current State): The question is "What is the cost of electricity for this mobile home?". The instruction says: "We know that the cost of utilities can fluctuate. Feel free to provide an estimate, or change 'About' to 'Exactly' if you can list a precise amount. Please round to the nearest dollar (do not include cents)." The input field shows "We pay About \$ 100 every Select period". The "About" dropdown menu is open, showing "About" and "Exactly" options.

Bottom Screenshot (Recommended State): The question is the same. The instruction is the same. The input field shows "We pay Exactly \$ 85 every Month". The "Month" dropdown menu is open, showing "Month", "Week", "Year", and "Something Else" options. The "Year" option is highlighted.

Both screenshots show a progress bar on the left with a red 'X' indicating a failed question. The bottom screenshot also shows "PREV" and "NEXT" buttons at the bottom.

National Household Education Survey (NHES)

example of time spent at daycare

How many **DAYS** each **WEEK** does Jane go to this day care?

days each week

How would you like to report the hours Jane attends this Day care?

☐ Hours per week

☐ Hours per day

[Previous](#) [Next](#)

How many **DAYS** each **WEEK** does Jane go to this day care?

days each week

How would you like to report the hours Jane attends this Day care?

☒ Hours per week

☐ Hours per day

About how many **HOURS** each **WEEK** does Jane attend this Day care?

hours per week

[Previous](#) [Next](#)

NHES example of day care costs

What is the easiest way for you to tell us the amount your household pays for Jane to go to this day care?

Do not include any money that you may receive from others to help pay for care.

☐ Hourly

☐ Daily

☒ Weekly

☐ Every 2 weeks

☐ Monthly

☐ Yearly

☐ Other – Specify:

☒ Weekly

☐ Every 2 weeks

☐ Monthly

☐ Yearly

☐ Other – Specify:

How much does YOUR HOUSEHOLD pay for Jane to go to this Day care weekly, NOT COUNTING any money that you may receive from others to help pay for care?

Enter '0' if your household does not typically pay for this care.

\$.00

[Previous](#)

[Next](#)



What's the best design for a survey question with a dynamic timeframe?

- ACS was not able to test this topic in the production setting
- So – our team decided to test alternate ways of asking timeframe questions
 - Focused on personalizing the question based on the respondent's situation

Method

- Two Rounds - modifying the design in each round
- Split-panel survey with 2 conditions
- Between-subjects design
- Three main questions where we captured data:
 - Questions on paying for household electricity (amount paid)
 - Questions asking for water and sewer (amount paid)
 - Question asking about respondent wages (amount earned)
 - Follow up question that calculated the income amount for a year and asked if the amount was correct, if not, open text field to input the correct amount.

Data collection

- Online survey using Qualtrics platform
- Non-probability panel
 - Members of U.S. public who signed up to participate in surveys through a private panel provider
- Sample
 - Round 1: 520 completed surveys
 - Round 2: 508 completed surveys
 - Quotas set for region and participant age
 - No IE browser & PC only
- Data collected:
 - Round 1: June 8-16, 2020
 - Round 2: September 2-10, 2020

Round 1 design

Dropdown design

Did you receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS?

☒ Yes

☐ No

What was the amount you received? Report amount from all jobs before any deductions for taxes, bonds, dues, or other items.

I received \$.00 every

Select

Response options visible at all times

Did you receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS?

☒ Yes

☐ No

What is the easiest way for you to tell us the amount of wages, salary, commissions, bonuses or tips you receive?
This includes jobs before any deductions for taxes, bonds, dues, or other items.

☐ Weekly

☐ Every 2 weeks

☐ Twice a month

☐ Monthly

☐ Annually

What was the amount received every ? Report amount from all jobs before any deductions for taxes, bonds, dues, or other items.

\$.00



Outcome of first test

- It takes more time for users to answer the questions with response options visible at all times than it does to answer the question with dropdown design
- There was slightly more missing data in the dropdown design.
- So - we retested with a tweak to the dropdown design: switch the dropdown fields: first ask for the timeframe and second ask for the amount

Round 2 design

- Dropdown design

Did you receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS?

☒ Yes

☐ No

What was the amount you received? *Report amount from all jobs before any deductions for taxes, bonds, dues, or other items.*

Every

Select

 I receive \$.00

Did you receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS?

☒ Yes

☐ No

What was the amount you received? *Report amount from all jobs before any deductions for taxes, bonds, dues, or other items.*

Every

Week
2 Weeks
Twice a Month
Month
Year

 I receive \$.00

- Response visible at all times

Did you receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS?

☒ Yes

☐ No

What is the easiest way for you to tell us the amount of wages, salary, commissions, bonuses or tips you received?

☐ Weekly

☐ Every 2 weeks

☐ Twice a month

☐ Monthly

☐ Annually

What was the amount received annually?
Report amount from all jobs before any deductions for taxes, bonds, dues, or other items.

\$.00

Summary

- Accuracy
 - Swapping the two dropdown boxes didn't seem to matter. There was still a slight difference in item missingness
 - Frequency was more often left blank in the dropdown design than in the response visible on screen at all times
- Efficiency
 - Takes more time for design questions visible on screen at all times

Guideline: Personalizing questions to fit respondent situation

- When asking question where the answer may come in different timeframes – consider allowing respondents to choose the best timeframe for them.
- We tested two different “choose how to respond” designs
 - Mixed results
 - Either design could work, depending on question
 - But we recommend the design where responses are visible on screen at all times.

We recommend: Response visible at all times

Does anyone in this household pay for electricity?

☒ Yes

☐ No

What is the easiest way for you to tell us the amount your household pays for electricity?

☐ Weekly

☐ Monthly

☐ Every 3 Months

☐ Annually

How much does YOUR HOUSEHOLD pay for electricity monthly ?

\$.00

Did you receive any wages, salary, commissions, bonuses, or tips during the PAST 12 MONTHS?

☒ Yes

☐ No

What is the easiest way for you to tell us the amount of wages, salary, commissions, bonuses or tips you received?

☐ Weekly

☐ Every 2 weeks

☐ Twice a month

☐ Monthly

☐ Annually

What was the amount received annually?

Report amount from all jobs before any deductions for taxes, bonds, dues, or other items.

Thank you!

Erica Olmsted-Hawala

Erica.L.Olmsted.Hawala@census.gov

Input Field Formatting: Monetary values

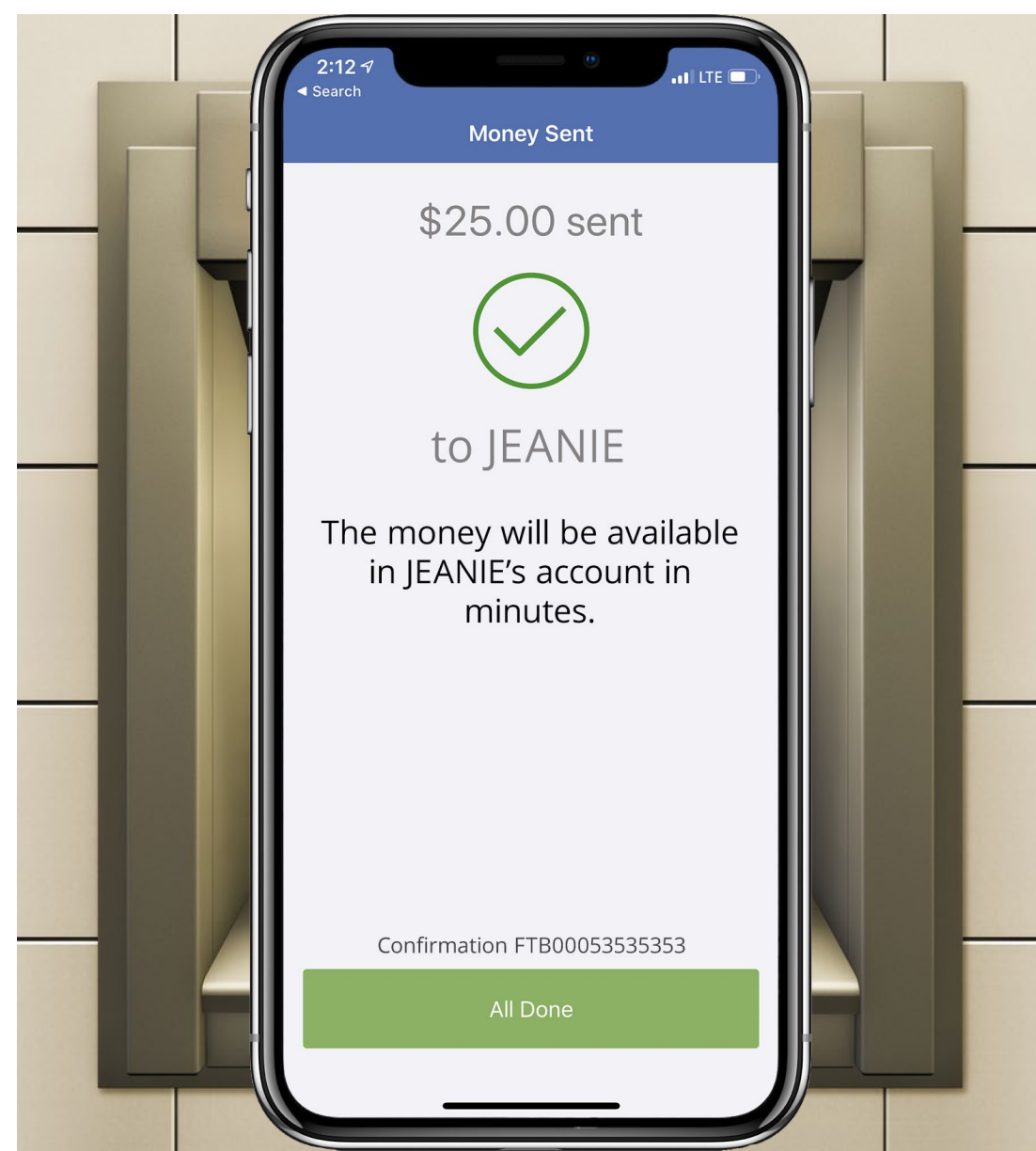
Temika Holland

Economic Statistical Methods Division, U.S. Census Bureau

Federal Committee on Statistical Methodology

October 27, 2022

Entering Dollar Values



Entering Dollar Values



Enter Amount



Send

\$0.00

to

Prior Research

- Research suggests that providing a visual template reduces reporting errors
 - (Couper et. al, 2011)

How much did you spend last month on PRESCRIPTION drugs?

\$.00

Next

Template example:

Household survey

➔ **IN THE PAST 12 MONTHS, what was the cost of water and sewer for this unit?** *If you have lived there less than 12 months, estimate the cost.* [\(Help\)](#)

Past 12 months' cost — Dollars

\$	Amount	.00
----	--------	-----

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Example from the American Community Survey

Template example: Business Survey

Description	Structures <small>HELP</small> (1)	Equipment <small>HELP</small> (2)	Other <small>HELP</small> (3) (Describe in Item 3)	Total (Add Columns 1+2+3) (4)
1. Capital expenditures for NEW structures and equipment (Include major additions, alterations, and capitalized repairs to existing structures)	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
2. Capital expenditures for USED structures and equipment	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000
3. TOTAL (Add Rows 1+2)	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000	\$ <input type="text"/> ,000

[Previous](#)[Next](#)

Example from the Annual Capital Expenditures Survey

Template **outside** the input field

TOTAL AMOUNT for past 12 months

\$

|

.00

\$

,000

Template **inside** the input field

<

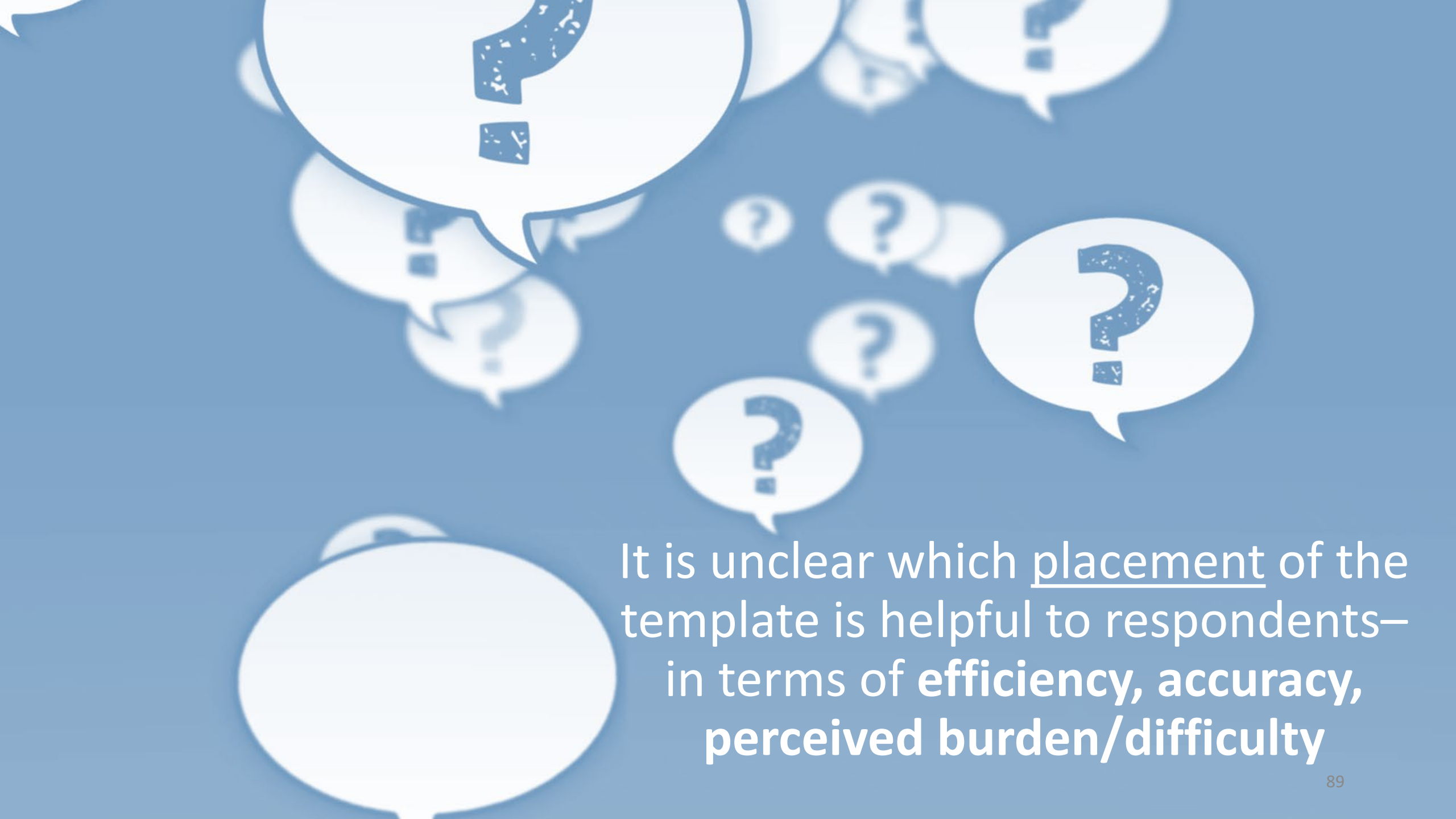
Enter Amount

M

Send

\$0.00

to



It is unclear which placement of the template is helpful to respondents—in terms of **efficiency, accuracy, perceived burden/difficulty**

Methodology: Participants

- 515 participants
- 44% Male/ 56% Female
- Age (mean=46 years old; range = 18-96)
- 9% Hispanic origin/91% not of Hispanic origin
- 76.5% White only/ 23.5% non-White only
- 34% High school or less / 66% more than high school
- .5% Mobile/99.5% PC or Mac



Methodology: Study Design

- Between-subjects design
- Two versions of the formatting template placement
 - Outside the field (n=256)
 - Inside the field (n=259)
- Each version contained four tasks
 - Whole dollar
 - Thousands

Challenge

- **Accuracy performance metric**
 - True value

Our solution

Tasks:

- 'Simple' addition problems
 - Whole dollar
 - Thousands
- Audio stimuli
 - Whole dollar
 - Thousands

Outside the Field: Whole Dollar

- Task 1: 'Simple' addition

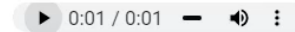
Enter the solution to the *nearest whole dollar*:

$$\$35.10 + \$1.20 =$$

\$.00

- Task 2: Audio

Click on the arrow to hear the value to enter in the box.



Enter the value to the *nearest whole dollar*:

\$.00

Outside the Field: Thousands

- Task 3: 'Simple' addition

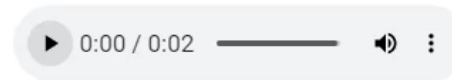
Enter the solution *rounded to the thousands*:

\$20,020 + \$5,000 =

\$,000

- Task 4: Audio

Click on the arrow to hear the value to enter in the box.



Enter the value *rounded to the thousands*.

\$,000


Inside the Field: Whole Dollar

- Task 1: 'Simple' addition

Enter the solution to the *nearest whole dollar*:

$\$35.10 + \$1.20 =$

- Task 2: Audio

 Click on the arrow to hear the value to enter in the box.

|| 0:00 / 0:01 ————— 🔊 ⋮

Enter the value to the *nearest whole dollar*:

Inside the Field: Thousands

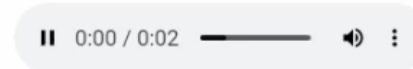
- Task 3: 'Simple' addition

Enter the solution *rounded to the thousands*:

$\$20,020 + \$5,000 =$

- Task 4: Audio

Click on the arrow to hear the value to enter in the box.



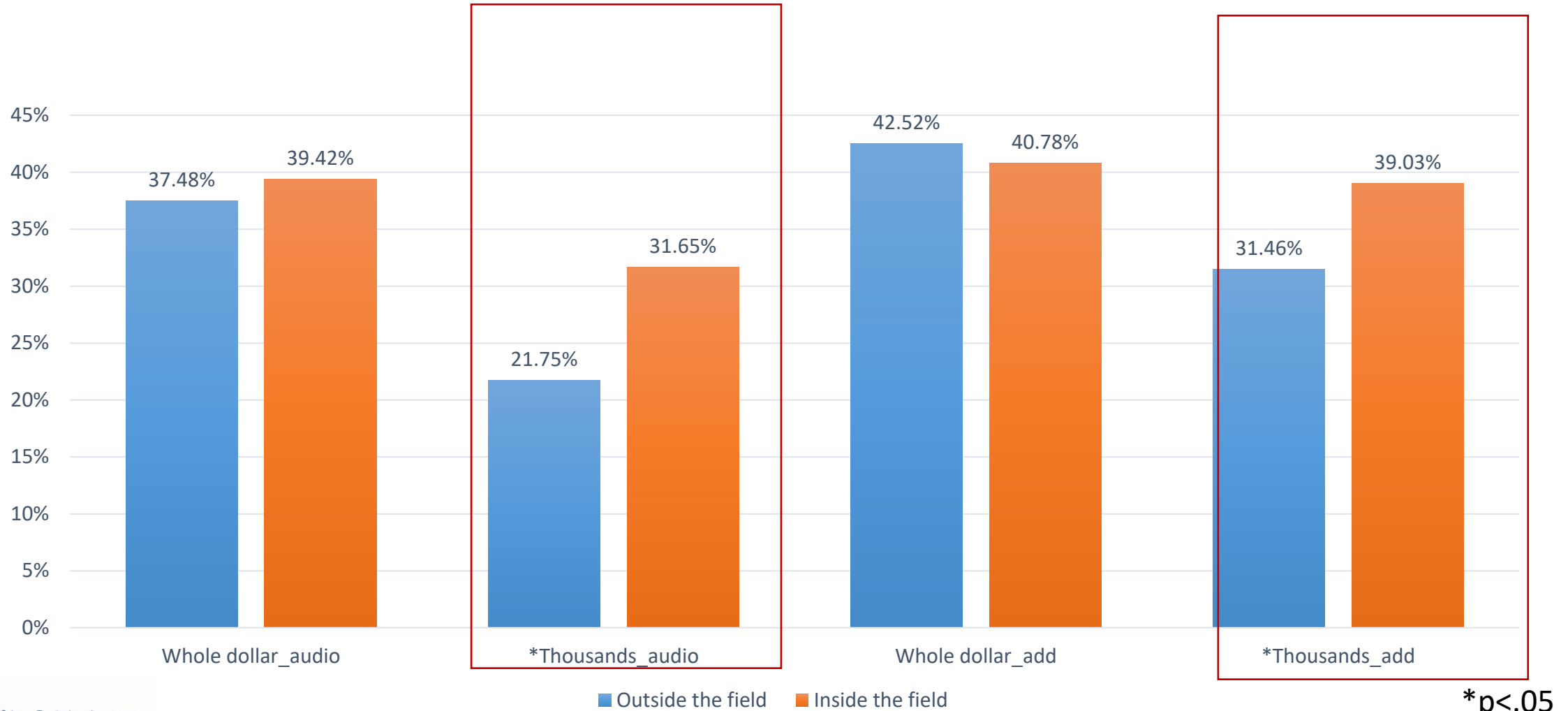
Enter the value *rounded to the thousands*:

TDM	729.89	915.51	185.62▲25.43%	FLR	660.27	745.28	85.01▲12.88%
HUM	749.73	924.29	174.56▲23.28%	UVD	155.59	181.57	25.98▲16.70%
DMW	833.72	1004.01	170.29▲20.43%	QUV	440.55	540.21	99.66▲22.62%
YZJ	903.49	1127.46	223.97▲24.79%	HZT	285.51	344.98	59.47▲20.83%
GLY	982.07	1219.39	237.32▲24.17%	PCW	811.44	1029.66	218.22▲26.89%
VDA	113.74	143.41	29.67▲26.09%	AIK	361.77	451.39	89.62▲24.77%
UVV	468.08	535.41	67.33▲14.38%	ZJJ	858.36	994.57	136.21▲15.87%
HJS	545.49	659.05	113.56▲20.82%	RHJ	894.79	1046.68	151.89▲16.97%
EQC	586.98	684.69	97.73▲17.24%	VGV	426.08	509.95	84.87▲19.97%

PPI	912.63	1038.36	125.73▲13.78%	ZBK	391.59	491.48	99.89▲25.51%
UAQ	1309.55	1655.62	346.07▲26.43%	BNY	969.21	1130.65	161.44▲16.66%
DAQ	1295.17	1641.66	346.49▲26.75%	SDM	735.44	913.39	177.95▲24.20%
PNR	654.33	775.84	121.51▲18.57%	TQJ	1323.91	1646.42	322.51▲24.36%
ZTM	251.59	309.52	57.93▲23.02%	OIS	543.42	667.24	123.82▲22.78%
				TTX	1482.17	1829.38	347.21▲23.44%

Results

Accuracy



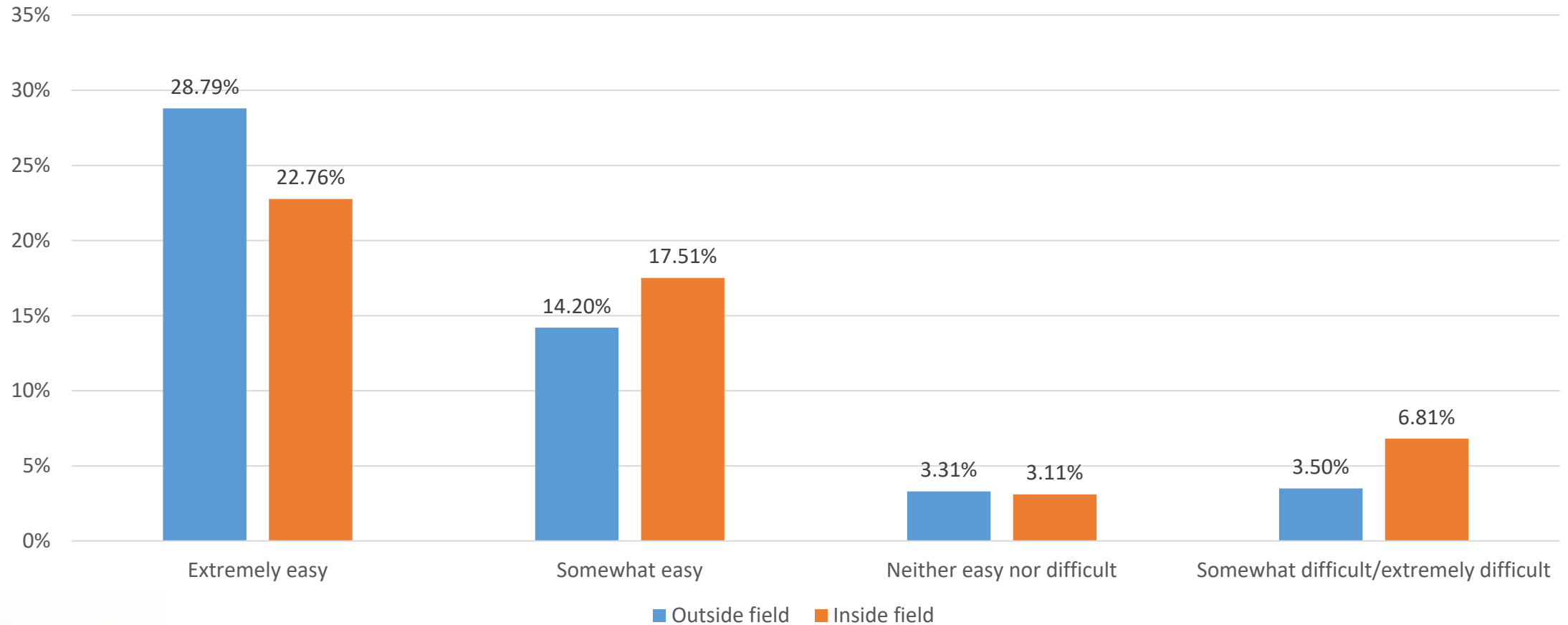


Completion Time

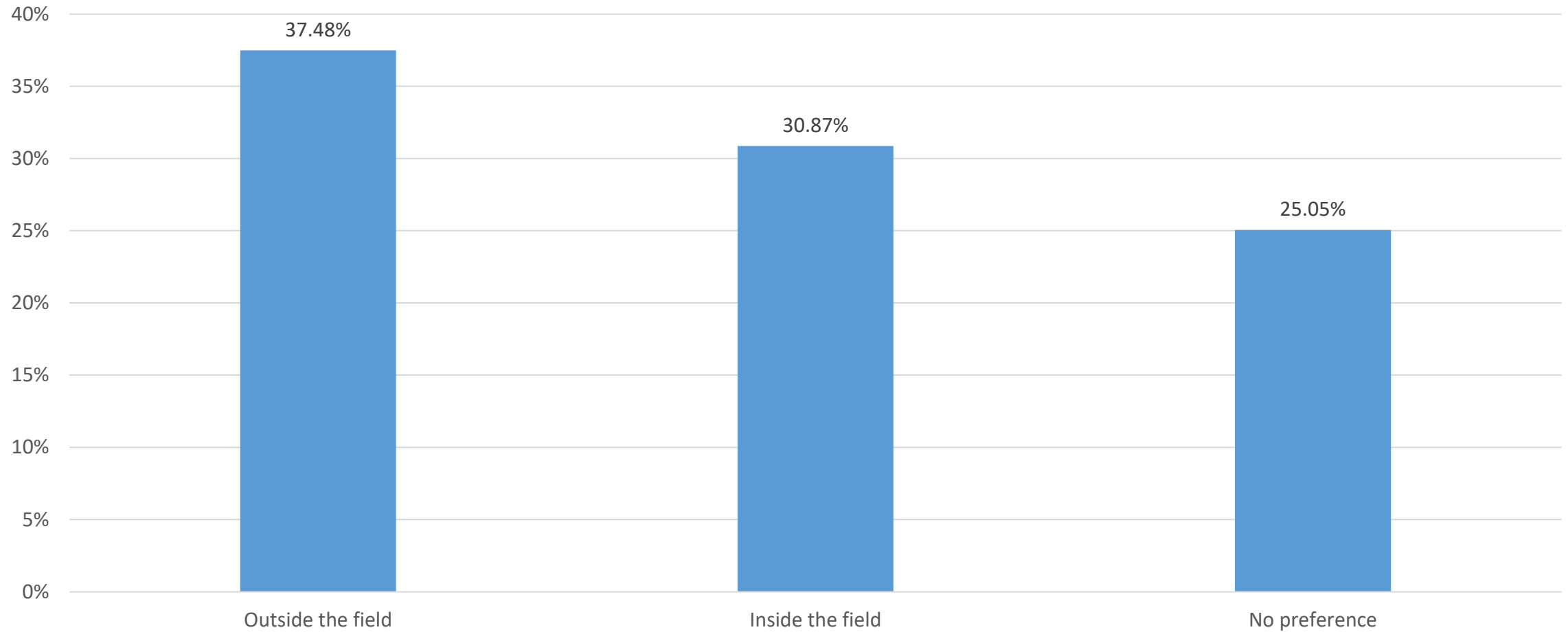
- Mixed Model Analysis of log of time
 - Longer completion times when format is **inside the field**
 - Whole dollar ($p < .01$)
 - Thousands ($p = .07$)

Ease/Difficulty

For the questions you just answered, how easy or difficult was it for you to enter the correct amount **using the formatting of the box?**



Preference



Summary

- Formatting **inside the field** may be helpful when requesting large values (thousands) as this resulted in greater accuracy
- Formatting **inside the field** takes longer to complete when entering small values (whole dollar)
- Formatting **outside the field** was perceived as less difficult

Additional findings



- Requiring participants to **add values** took **longer to complete**
- Communicating values via **audio stimuli** took **less time** for task completion
- Entering **smaller values** took **longer** to complete

The Guideline

\$.00
----	--	-----

\$,000.00
----	--	---------

- For monetary data rounded, place the format (“00” “,000.00”) **outside the field** to the right, and the \$ symbol outside the field to the left
- Do NOT allow entry of a decimal.

Thank you!

Temika Holland

temika.holland@census.gov

Questions

- Lora Rosenberger – U.S. Census Bureau Enterprise solution
- Elizabeth Nichols – Navigation buttons
- Shelley Feuer – Edit validations
- Branding – Jonathan Katz
- Progress Indicators – Rachel Horwitz
- Personalizing Questions – Erica Olmsted-Hawala
- Input field formatting for monetary values – Temika Holland

Request a copy of the web survey design guidelines

