

Equity & Inclusion in Accessible Survey Design

Inclusive Research Matters Series
University of Michigan
Institute for Social Research

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Background . . .



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Key Accessibility Laws

1990

- **The American with Disabilities Act (ADA).**
- Provides “civil rights protections to individuals . . . with disabilities in public accommodations, employment, transportation, State and local government services, and telecommunications”.

1998

- **Section 508 added to the Rehabilitation Act of 1973.**
- Requires government agencies make their websites more accessible.

1999

- **World Wide Web Consortium (W3C) releases Web Content Accessibility Guidelines (WCAG)**
- Provides a framework for creating website and apps that are accessible. Very specific and technical. WCAG 2.0 released in 2008. WCAG 2.1 released in 2018.

- More on Disability Rights Laws: <https://www.ada.gov/cguide.htm>

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Accessibility in Survey Research *Common Issues (Beyond the Technology)*



Consider Language Used (i.e., translations, readability, etc.)



Consider Literacy Levels



Consider how visual content is being used

Slider bars

Semantic differential scales

Use of images / reaction to images without comparable text

Use of colors alone



Consider offering multiple modes of data collection (especially if self-administered)—but do not rely on mode choice as an easy solution!



Consider equity in alternative designs—Is an interviewer administered survey equal to a self-administered survey?

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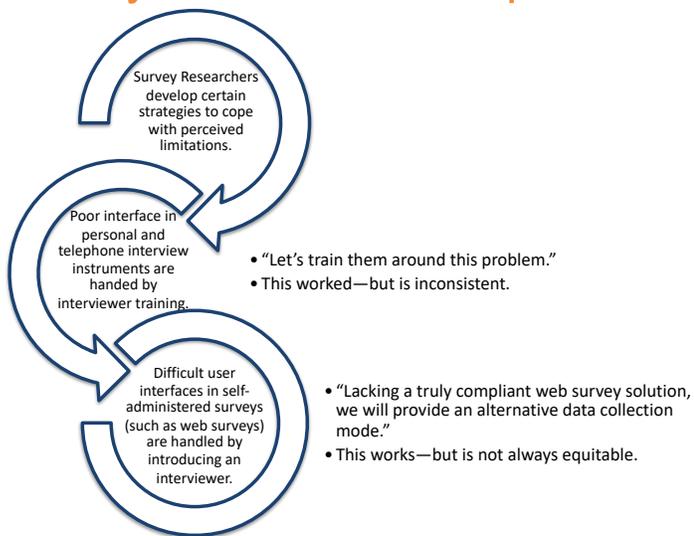
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Why it matters . . .



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One Survey Researcher's Opinion



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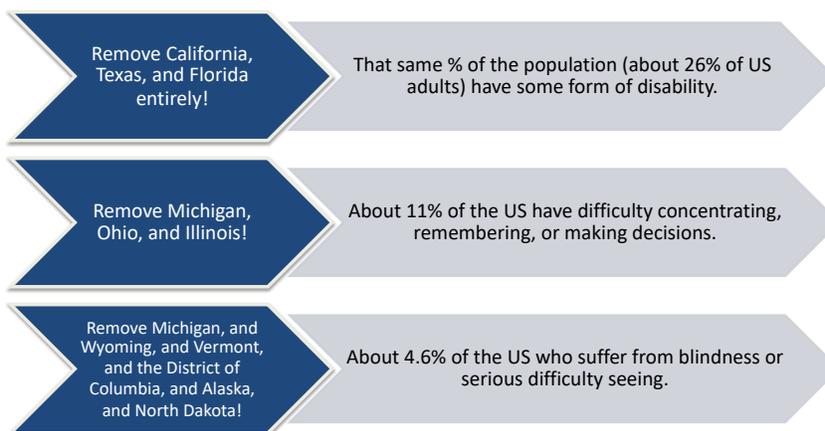
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Why it matters?

Consider a study designed to be nationally representative...



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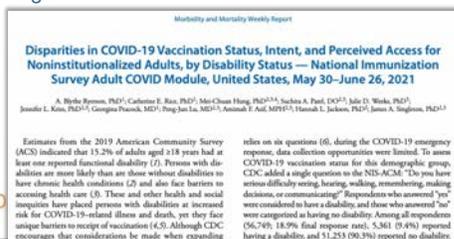
Not Convinced? A Recent Real-World Study

Recent CDC study conducted at NORC (National Immunization Survey) published in October found:

1. Adults with a disability were less likely to **report receiving at least one dose of or being unsure about getting a COVID-19 vaccine.**
2. They were also more likely to report barriers to vaccination, including:
 - Getting an appointment online
 - Knowing where to get vaccinated
 - Getting to a vaccination site

Question format used: "Do you have serious difficulty seeing, hearing, walking, remembering, making decisions, or communicating?"

Ryerson AB, Rice CE, Hung M, et al. Disparities in COVID-19 Vaccination Status, Intent, and Perceived Access for Noninstitutionalized Adults, by Disability Status — National Immunization Survey Adult COVID Module, United States, May 30–June 26, 2021.



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The technology . . .



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Technical Background

Utilize technology and survey design to improve respondent interaction, increase engagement, and improve data quality.

We must consider those who use computers in non-standard ways.

Assistive/ accessible technologies cover a large segment:

- Assistive hardware
- Screen readers & magnifiers
- Speech control / dictation software
- Mousegrids

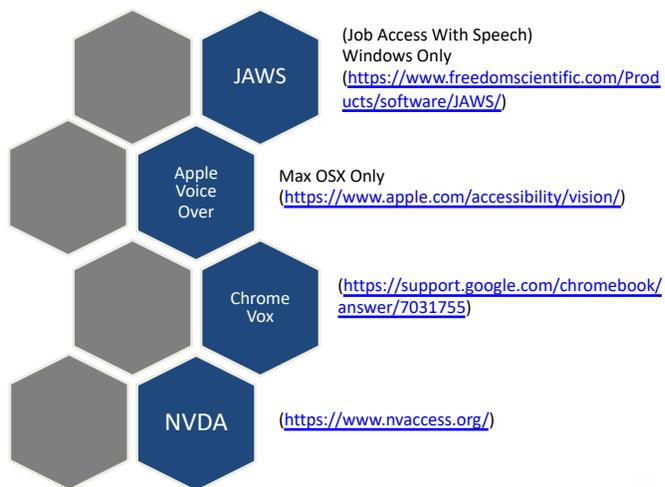
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Screen Readers & Magnifiers (for Visual Impairment)

Screen readers and magnifiers are software tools that will describe using voice and/or magnification around what is displaying on the computer.



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Braille Displays

Works in combination with screen readers.

Presents a portion of what is on the page (typically between 40 and 80 characters at a time) and is refreshed as the user navigates around the page. Displays can cost several thousand dollars—high end units can be over \$10,000.



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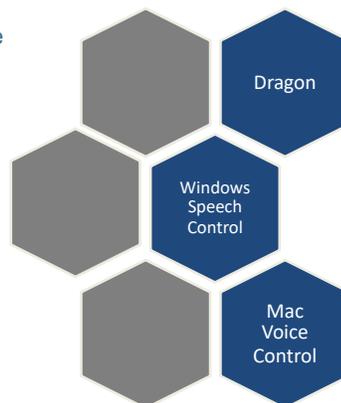
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Speech control / dictation software

Speech control / dictation software helps you input contents into your computer using speech. This could include content (such as writing an email) and commands (such as sending an email).



Primarily Mac
<https://www.nuance.com/dragon.html>

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Mousegrids

Often integrated into speech control software, it is a technique where the screen is broken up into a grid, where numbers allow the user to “zoom” in to identify an area to see or click.



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Our Challenge . . .



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Study Design (DEI Survey @ U-M 2017)

Questionnaire

- Average 15 minutes
- Mobile optimized
- Accessible to all as a Census of all students, staff, and faculty (followed a survey effort fielded the previous Fall)

Incentives

- Random drawing for gift cards

Messaging

- Coordinated
- Consistent
 - Authoritative internal sources
 - Media, press
 - External sources

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Applying Accessibility to a Survey of Diversity, Equity, and Inclusion (2016 @ U-M).

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Conduct a Diversity, Equity, and Inclusion survey as a *census* study at a large university

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Assure that the study be open and available to all students, faculty, and staff who wish to participate

3

Participants should be given an equal opportunity to participate confidentially

4

Adjust the web-based survey to adapt for screen readers or other assistive devices

GOAL:

Provide an equitable experience for all participants, not only accessible and inclusive.

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Our Resources

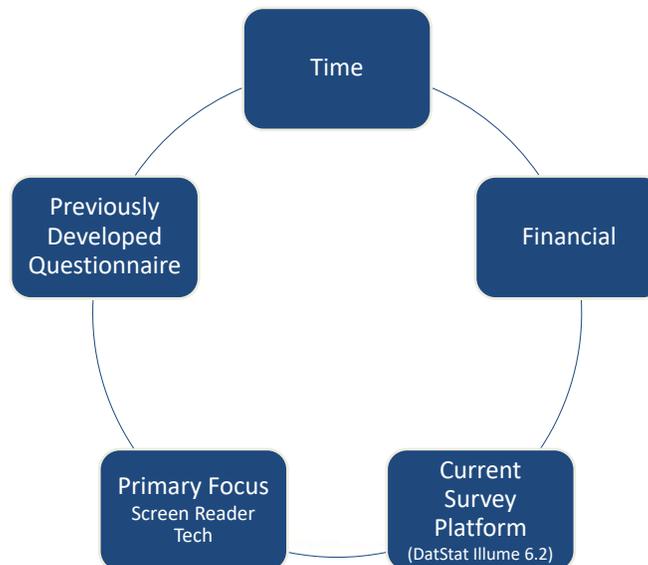
1. Consulted with IT-Accessibility & Institutional Equity experts
2. Used two primary resources:
 - **WebAIM** (webaim.org) – great web accessibility resource
 - **WCAG**
(<https://www.w3.org/WAI/standards-guidelines/wcag/>)
3. Implemented technical changes including:
 - **Overall design changes** (header, question layout)
 - **Code changes** (input box labels, toggle indicator)
 - **Question wording differences** (semantic differentials)

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Common Limitations



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Decision 1: Accessible for All?



Do we implement an accessible version for all participants?



Are there things that we will miss if we do?

Ultimately, we decided that we would give up too much of the science if we converted the entire questionnaire to be accessible. There was also a concern around timeline.

We decided to proceed with a parallel instrument.

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“Detecting” Assistive Tech



No consistent and good way to do this via script or automation. We could identify some but would likely miss many.

Our solution? **Ask the responder!**

This web survey is available in an accessibility optimized format. Check this box if you will be using assistive technologies such as screen readers during this survey.

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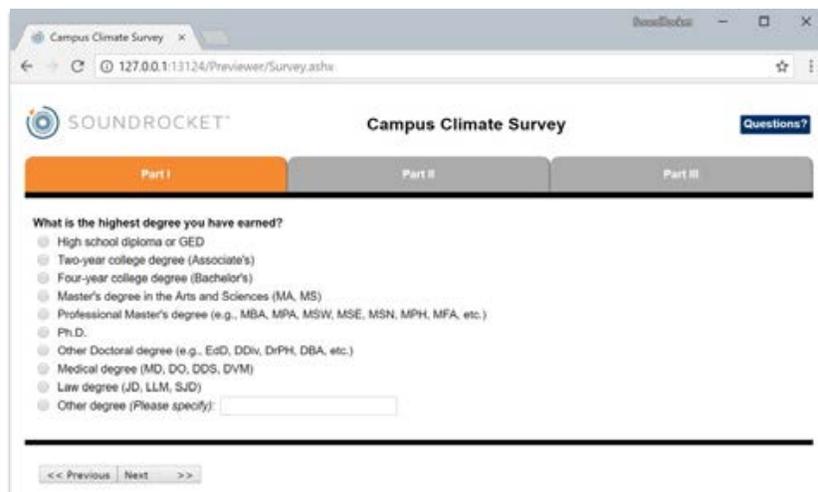
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Let's take a look at the technical changes made . . .



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Design Modifications: Header



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Design Modifications: Header

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Design Modifications: Grids

	Never	Occasionally	1-2 times a month	Weekly	Daily
Campus clubs or groups	<input type="radio"/>				
Class study groups	<input type="radio"/>				
Sporting events	<input type="radio"/>				
Social events on-campus	<input type="radio"/>				
Social events off-campus	<input type="radio"/>				

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Design Modifications: Grids

Accessible Version

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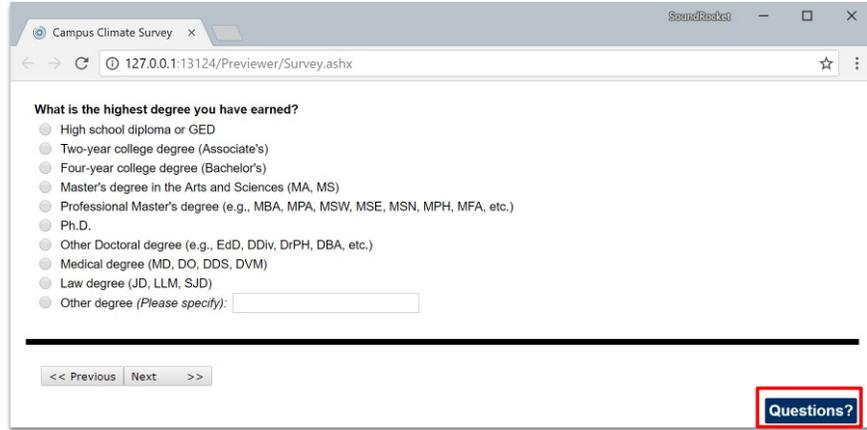
Code Modifications: Text Boxes

Other degree (Please specify):

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Code Modifications: *aria-expanded*



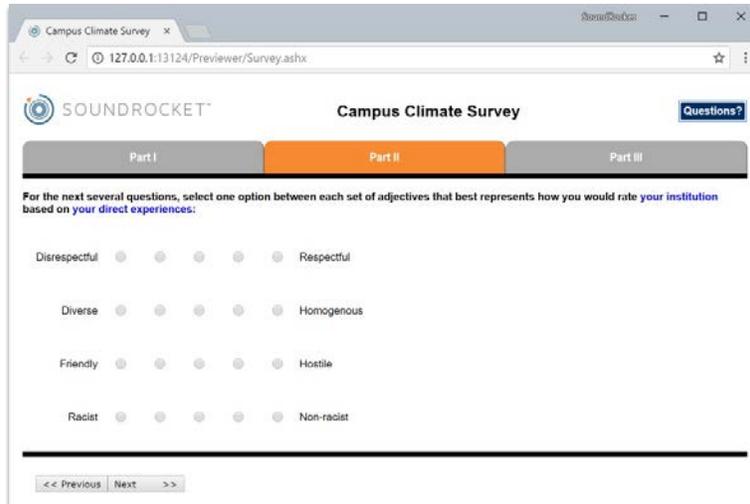
```
buttonId.setAttribute("aria-expanded", "true");
```

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Q Modifications: Semantic Differentials



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Semantic Differentials: A Questionnaire Design Solution

Text Updates:

- **OLD:** For the next several questions, select one option between each set of adjectives that best represents how you would rate your institution based on your direct experiences.
- **NEW:** For the next few questions, we will ask you to think about a scale from one to five. You will be presented with a word pair where one represents the first word of the pair, and 5 represents the second word of the pair.

Thinking of the words Friendly and hostile, where 1 represents Friendly and 5 represents Hostile, including all values in between, which adjective best represents how you would rate your institution based on your direct experiences.

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Semantic Differentials: Text Change Combined with Technical Breakout

For the next several questions, select one option between each set of adjectives based on your direct experiences:

Disrespectful Respectful

Diverse Homogenous

Friendly Hostile

Racist Non-racist

<< Previous Next >>

For the next few questions, we will ask you to think about a scale from one to five. You will be presented with a word pair where one represents the first word of the pair, and 5 represents the second word of the pair.

Thinking of the words Friendly and Hostile, where 1 represents Friendly and 5 represents Hostile. On the scale of 1 to 5, including all values in between, which adjective best represents how you would rate your institution based on your direct experiences.

1
 2
 3
 4
 5

Thinking of the words Diverse and Homogenous, where 1 represents Diverse and 5 represents Homogenous. On the scale of 1 to 5, including all values in between, which adjective best represents how you would rate your institution based on your direct experiences.

1
 2
 3
 4
 5

Thinking of the words Racist and Non-racist, where 1 represents Racist and 5 represents Non-racist. On the scale of 1 to 5, including all values in between, which adjective best represents how you would rate your institution based on your direct experiences.

1
 2
 3
 4
 5

Thinking of the words Disrespectful and Respectful, where 1 represents Disrespectful and 5 represents Respectful. On the scale of 1 to 5, including all values in between, which adjective best represents how you would rate your institution based on your direct experiences.

1
 2
 3
 4
 5

<< Previous Next >> [Questions?](#)

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How'd it work . . . ?



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364 Participants Opted for the Accessible Version!

They took 12.1 minutes to complete the survey (vs. 11.5).

They were more likely to report the following disabilities . . .

- ADD (43% vs. 22%)
- Blind / Low Vision (14% vs. 2%)
- Deaf / Hard of Hearing (21% vs. 5%)

They were less likely to report chronic illness or mental health as a disability.

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But there was an oddity . . .

Only 4% of those who used the accessible version self-reported as having any form of disability.

They may have simply decided not to self-disclose the disability.

They may be survey research students/staff/faculty curious about the functionality.

So, who were the other 96%?

Something else?

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Substantively, on the topic of DEI, did it matter that we were more inclusive . . . ?



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Satisfaction with Overall Campus DEI Climate (2016 Data)

	Acc ON	Acc OFF	Disabled	Non-Disabled	Accessible Version + Disabled	Non-Accessible Version + Disabled
Very Satisfied + Satisfied %	54	63	51	63	40	51
n	76	9506	469	9070	6	463
Neutral %	29	23	27	23	40	27
n	41	3542	249	3308	6	243
Dissatisfied + Very Dissatisfied %	17	14	23	14	20	23
n	24	2165	211	1957	3	208

NS

Chi-square = 78.45
p < 0.01

NS

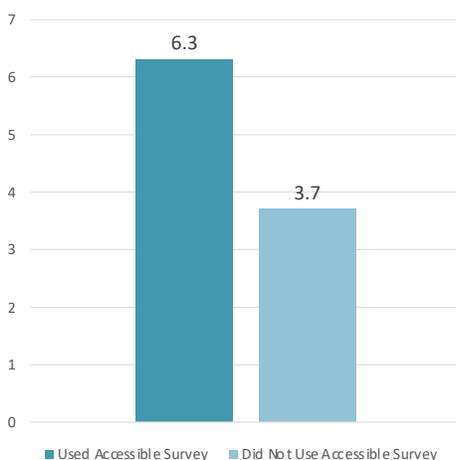
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Felt Discrimination re: Ability/Disability Status in Past 12 Months



Those who used the accessible version of the survey did report a higher level of discrimination regarding their **ability/disability status**—but **it was not a significant difference.**

Chi-square = 3.35
p = 0.067.

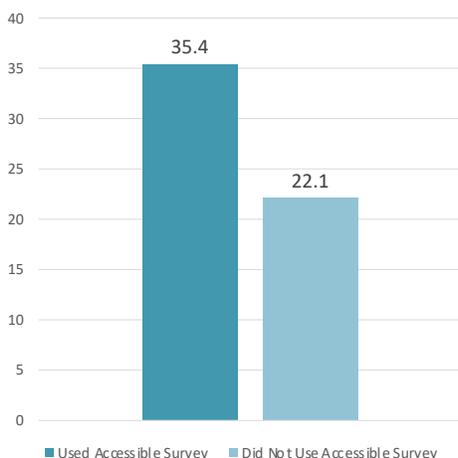
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Felt Discrimination re: Racial/Ethnic Identity in Past 12 Months



Those who used the accessible version of the survey also reported a higher level of discrimination based on **racial/ethnic identity**—and this **was significant**.

Chi-square = 18.5929
p < 0.01

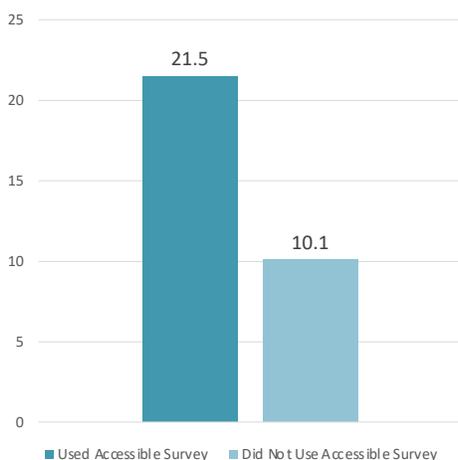
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Felt Discrimination re: Country of Origin in Past 12 Months



Those who used the accessible version of the survey also reported a higher level of discrimination based about **their country of origin**—and this **was significant**.

Chi-square = 25.20
p < 0.01

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Country of Origin—A hint at who may have been using the accessible version . . .

We know that about 15% of the students in the study were reported to have been born in the U.S. And that overall, over 70% of the population reported to be born in the U.S.

Seeing data that suggested that 21.5% of those who used the accessible version of the survey felt discrimination about their country of origin was a clue.



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Who Actually Used the Accessible Version?

		Accessible Version	Standard Version
Were you born in the United States, Puerto Rico, a U.S. Island area, or born abroad of U.S. citizen parents?	Yes	49.9%	73.6%
	No	50.1%	26.4%
Citizenship Status - Sample Variable	Non-Resident Alien	35.2%	14.1%
	Permanent Resident	1.9%	2.1%
	U.S. Citizen	62.9%	83.7%

50.1% of respondents using the accessible version reported that they were not born in the United States, compared to 26.4% using the standard version.

Using a variable indicating citizenship status (provided by the university in the sample file) we determined that 35.2% of accessible version respondents were classified as "Non-Resident Alien", compared to only 14.1% of standard version participants.

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Why so many non-US born / non-Citizens using the Accessible version?



We don't know for sure—more research is needed.

But we believe it is due to reliance on **screen reading translation tools**. Students who do not speak English as their primary language may be relying on translation software to complete the survey.

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Concluding Thoughts & Recommendations

- We can do better—don't be passive. Expect to learn at each step.
- Equitable and Accessible designs can **reduce nonresponse bias**.
- Equitable and Accessible design is good design for all. You **may also bring in others** who use the technology differently.

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Thank you!

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