

Proposed Standards and Guidelines for Mobile Instrument Design

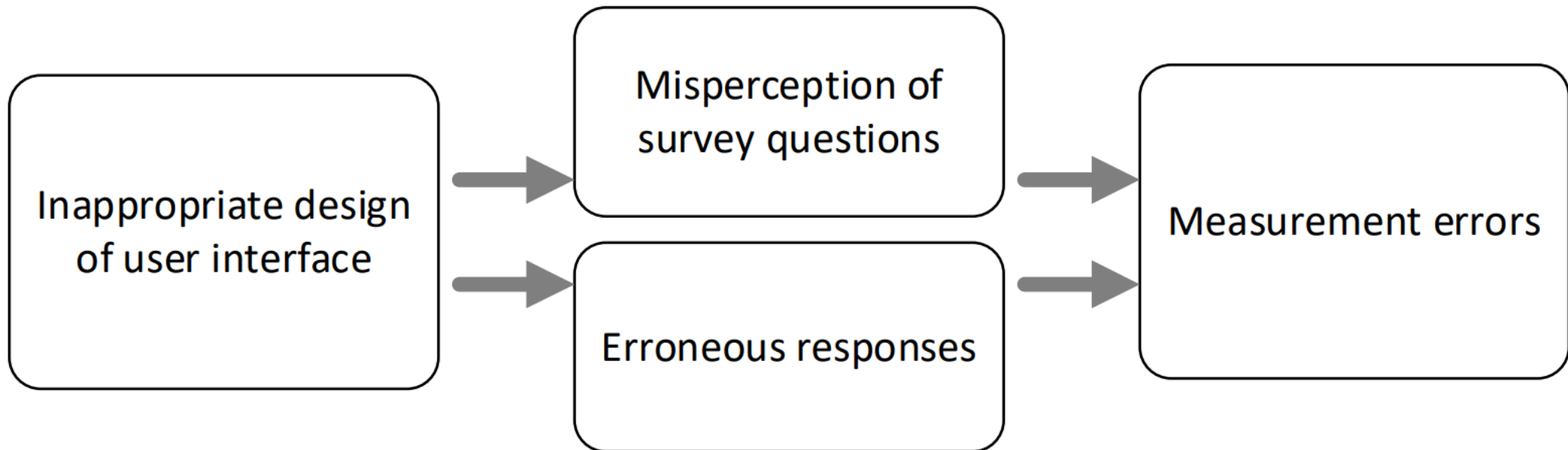
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September 2022

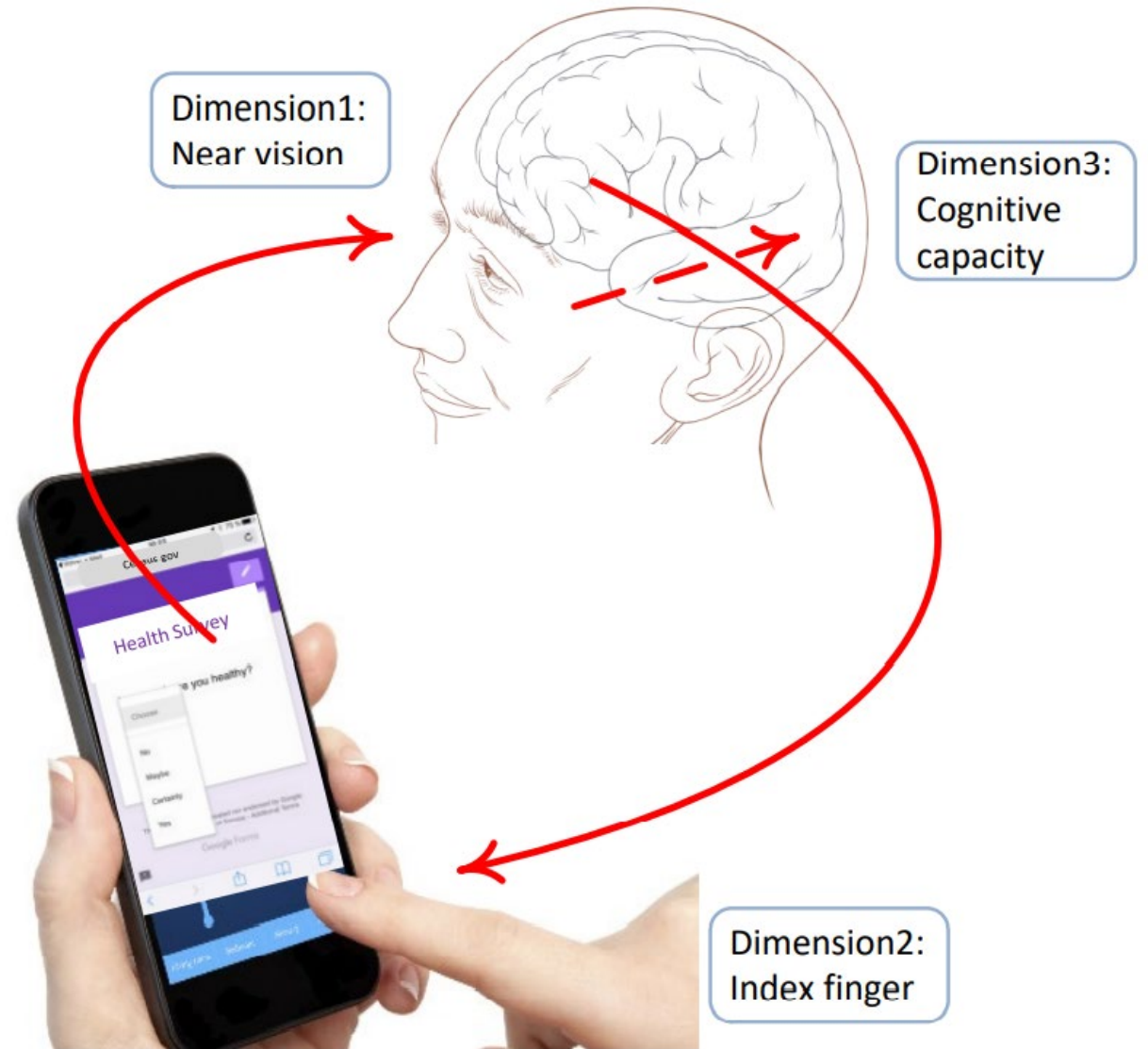
Why is instrument design important?

- A key concern over mobile survey instruments is the design of the smartphone screen (user interface) because it can have a significant impact on response quality.
- Devices' small screen size and touch interface creates usability challenges affecting the **effectiveness, efficiency, and satisfaction** of enumerator/respondent interaction with the survey instrument.
- Inadequate interface design could result in:
 - erroneous responses,
 - prolonged time in completing a survey,
 - breakoffs (incomplete surveys).
 - costs associated to re-designing and re-building a user interface

Total Survey Error Framework



Information Processing Model of Mobile Survey Operation



Mobile Survey Respondent Model

- Dimension I: Near vision
 - Habitual visual acuity: around 20/20
 - Normal contrast sensitivity
 - Color blindness
- Dimension II: Index finger
 - Operating fingertip breadth: 13 mm
 - Operating finger mobility: stiff but able to operate a smartphone/tablet
- Dimension III: Cognitive ability
 - Mentally alert
 - Fluent in a language (English)
 - Education: Middle school (8th grade or equivalent)

Proposed Standards Categories

1. Touch target size
2. Text display
3. Luminance and color

Proposed Guidelines Categories

- 30 guidelines on types of components in a mobile survey display:
 - Questionnaire display or layout
 - Supporting information display (e.g., help link)
 - Login ID entry
 - Navigation
 - Labeling of action buttons
 - Question stem and response option
 - Interviewer-administered surveys

Standard 1: Touch Target Size

Size of Touch Button:

At least
6 mm of
square side
or circle
diameter

The following wireframe depicts a design of 6-mm radio buttons as response option icons

We depend too much on science and not enough on faith.

1 = strongly disagree

2

3

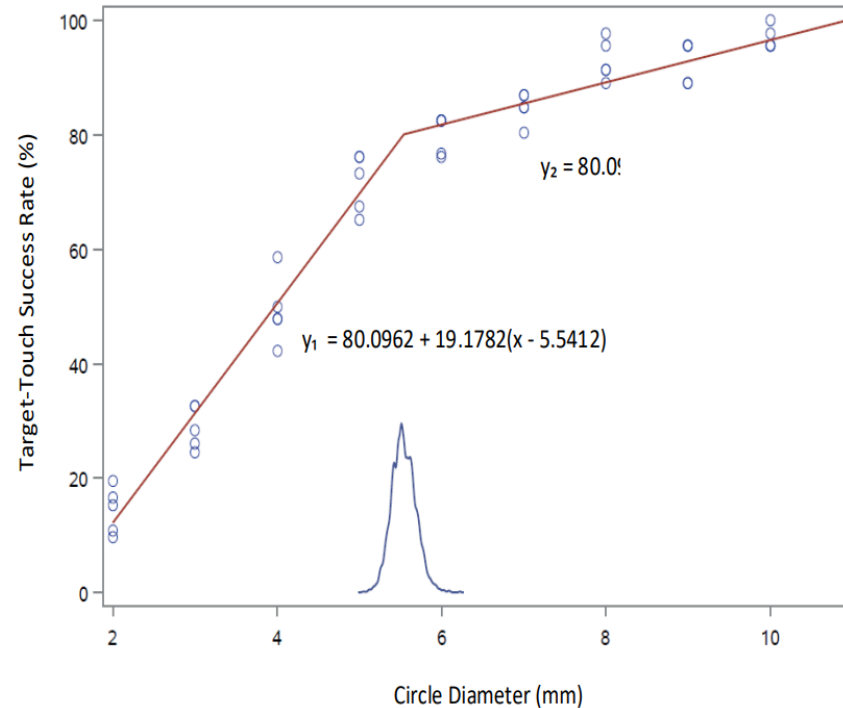
4

5

6

7 = strongly agree

The graph below shows the success rate of touching a circular target as a function of target diameter: success rate rapidly increases to above 80% when target size increases from 2 mm to 6 mm, then the curve is bent. Similar behaviors were observed for a



Standard 2: Text Display

**Font Size
for Text
Display:
At least
2-mm
x-height**

The beaver is an excellent swimmer. It can achieve a speed of up to seven miles per hour in water. Its protection against the cold consists of a skin with thousands of single hairs and a thick layer of fat. With its big lungs it can easily stay under water for more than twenty minutes. The beaver is not only skilful in felling trees, but also an experienced craftsman in building dams. When the beaver fells a tree, it gnaws on the trunk in such a way that the upper and the lower part of the trunk are only connected with each other at a small point. When the connection is narrow and the beaver has become tired, the wind will do the rest. The twigs and thin branches are cut off by the beaver and piled up near its den, which is built on a small island. The thick branches are sorted out and

1 mm x-height

on the tops of high mountains and in deserts. If an empty piece of land is left to itself for long enough, after some time trees will start to grow. At first, the ground is covered with low plants. Later, bushes grow and in their shade, some of the lower plants that had established themselves first, then die. When still more time has passed, trees start to grow. As they grow bigger,

1.5 mm x-height

plants survive times of drought in the form of seeds which often lie buried in the ground for several years and do not put out shoots before it rains. When that happens, the plants grow very

2 mm x-height

deep cellar. Every night, mice came in droves out of this cellar into the shop. They ate apples and pears, grapes and

2.5 mm x-height

animals face the problem of how to get hold of their prey. Many animals seek and

3 mm x-height

Standard 3: Luminance

**Luminance
Ratio
between
Text and
Background:
Maintain a
ratio of at
least 4.5 to 1**

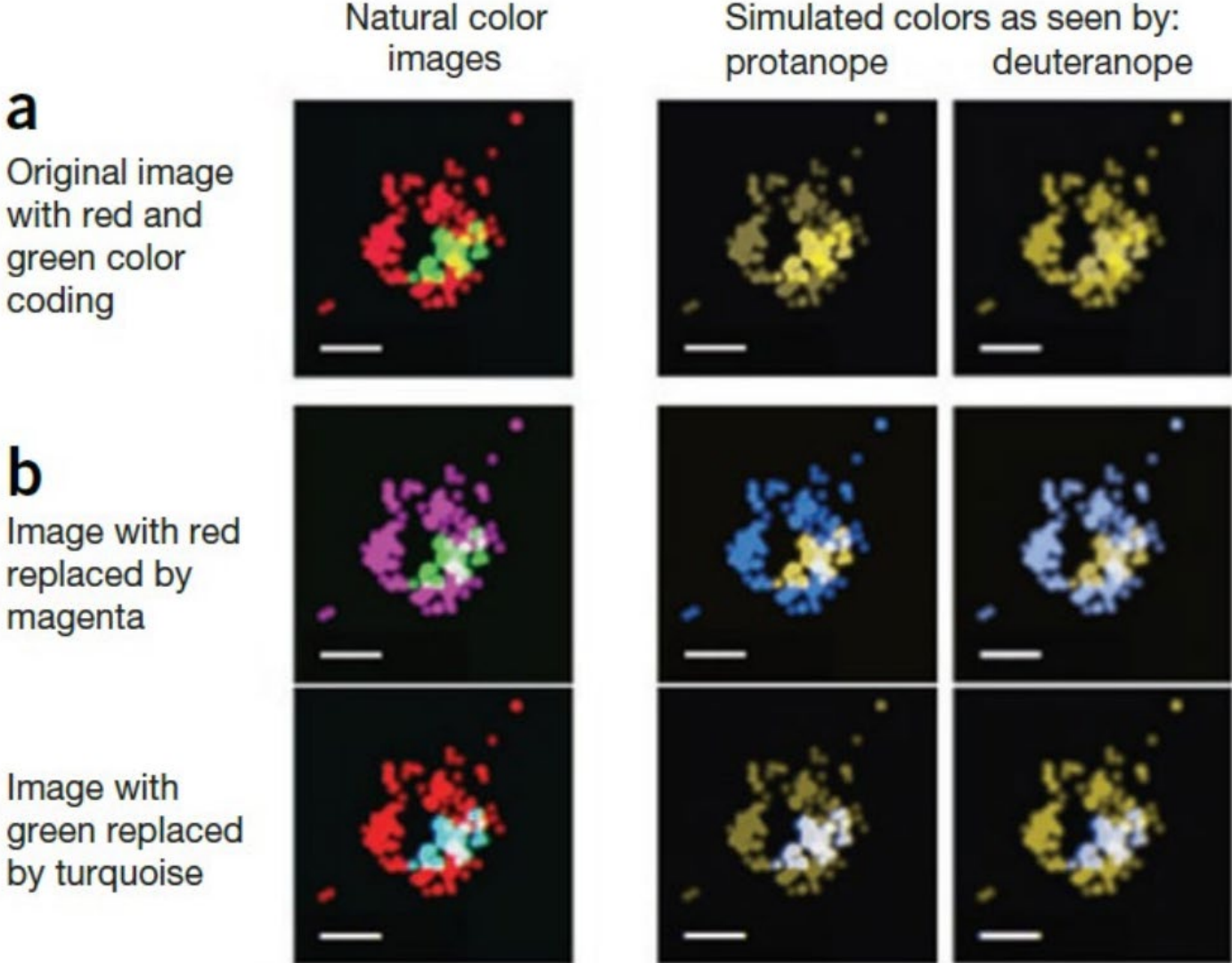
4.5:1
contrast

3.66:1
contrast

2.78:1
contrast

Standard 3: Color

**Use of Color:
Avoid placing
red and
green colors
next to each
other**



Guideline 1: Design questionnaires optimized for portrait orientation

Verizon LTE 1:53 PM 92%

mobile.respond.qa.census.gov

2015 National Content Test

What is the name of each person who will be living or staying at RR 3, Box 45 on September 1, 2015? [\(Help\)](#)
Enter names until you have listed everyone who will be living or staying there, then click Next.

The names listed so far are:

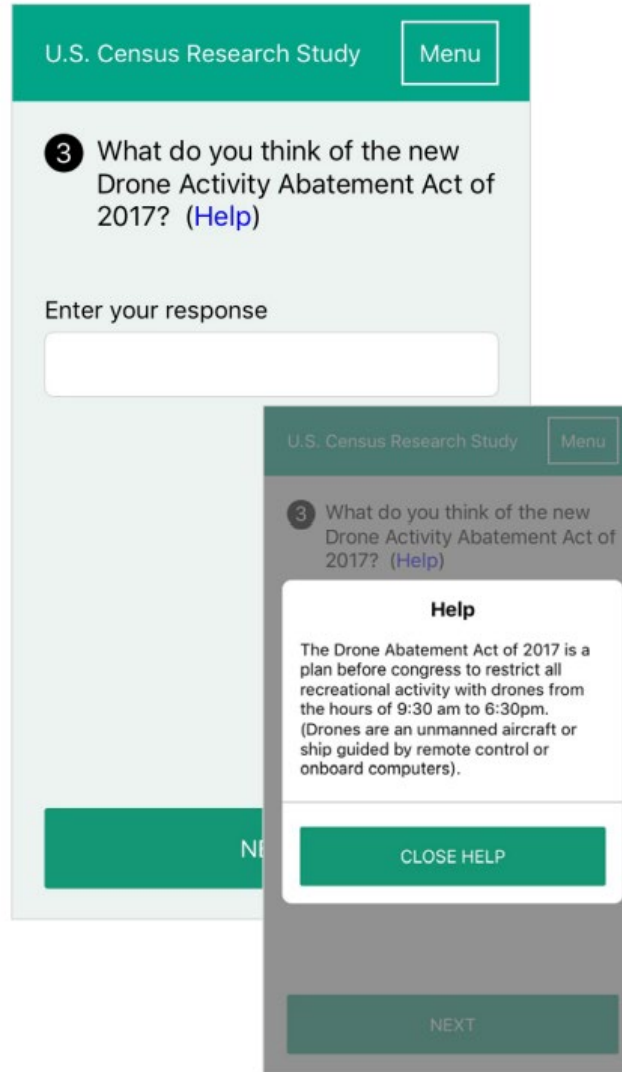
John A Doe

First name 1:

Middle name 1:

Last name 1:

**Guideline 7:
Place a
question-
specific "Help"
link next to
question stem
or on a new
line below
question stem**



Guideline 8: Display error messages at the top of screen


Enter the full state name.

In what U.S. state did you last attend high school?

If you attended school outside the U.S.

Next

Done



What is your date of birth?

Next

Enter your date of birth in this format:
MM/DD/YYYY

OK



In what U.S. state did you last attend high school?

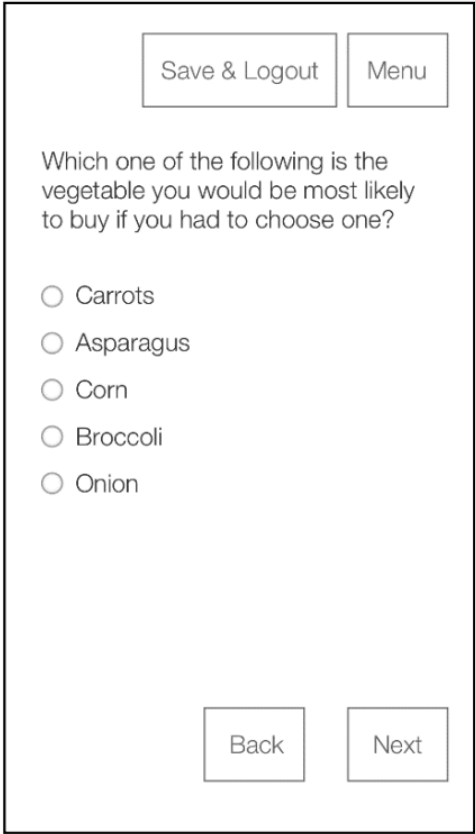
Enter the full state name.

If you attended school outside the U.S.

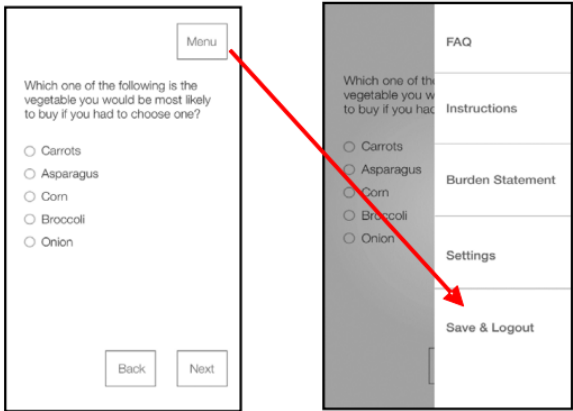
Next



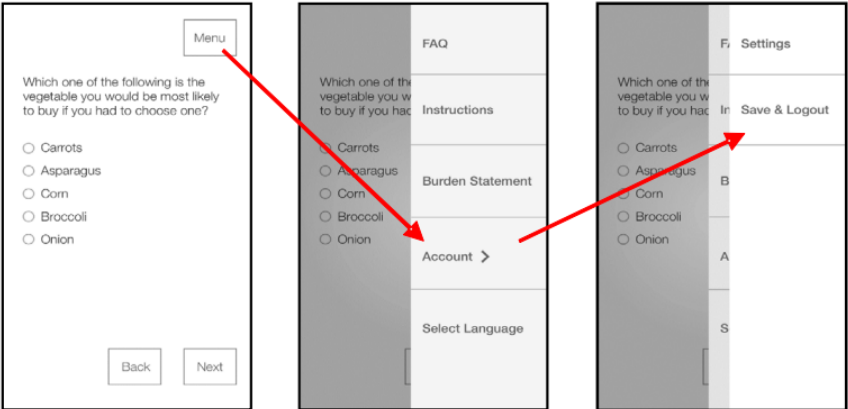
Guidelines 12 and 13: Label a Logout button with the text of “Save and Logout” Place the “Save & Logout” button on screen where it is visible



A



B



C

Guideline 15: Bold survey question stems and italicize instructions

9:41 AM

Have you completed a secondary (high) school diploma or equivalent?

Examples of secondary (high) school equivalency certificates are General Educational Development (GED) and Adult Basic Education (ABE).

Yes, secondary (high) school diploma

Yes, secondary (high) school equivalency certificate

No

Next

Guideline 17: Use keyed- entry format for Date entry

2:47 PM 95%

Enter the following date:
March 25, 2000

Month Day Year

Submit

January
February
March
April
May
June
July
August

Picklist



2:49 PM 95%

Enter the following date:
12/05/2016

Month Day Year

Submit

1 2 3
4 5 6
7 8 9
0

Keyed entry



3:04 PM 97%

Enter the following date:
March 25, 2000

Month Day Year

Submit

January
February
March
April
May
June
July
August

Hybrid



Guideline 18: Use a radio button or text box for “Choose-one” response options

What is the highest grade in elementary school or high school that you finished and got credit for?

7th grade
 8th grade
 9th grade
 10th grade
 11th grade
 12th grade
 Don't know

Next

A 

In what U.S. state did you last attend high school? Enter the state abbreviation.

State
Md

State Done

“Md” Me Meet

q w e r t y u i o p
a s d f g h j k l
↑ z x c v b n m ↵
123 🗨️ 🗨️ space return

B 

In what U.S. state did you last attend high school?

Select One

Select One Done

AL - ALABAMA
AK - ALASKA
AZ - ARIZONA

C 

In what U.S. state did you last attend high school?

Select One

NE - NEBRASKA
NV - NEVADA
NH - NEW HAMPSHIRE
NJ - NEW JERSEY
NM - NEW MEXICO
NY - NEW YORK
NC - NORTH CAROLINA

Next

D 

Guidelines 20 and 21: Display response options in vertical orientation Use single questions in place of grids



unipark.de/uc/slo_uni_ljub

Please evaluate the following products:

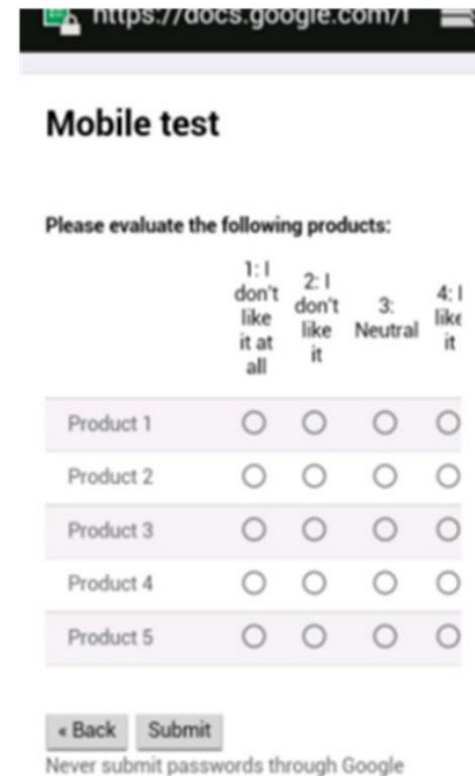
Product 1

- 1: I don't like it at all
- 2: I don't like it
- 3: Neutral
- 4: I like it
- 5: I like it very much

Product 2

- 1: I don't like it at all
- 2: I don't like it
- 3: Neutral

A



https://docs.google.com/1

Mobile test

Please evaluate the following products:

1: I don't like it at all 2: I don't like it 3: Neutral 4: I like it

Product 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

< Back Submit

Never submit passwords through Google

B




Guideline 26: Use predictive text for open- ended questions that have a finite list of known answers

What is your race or origin?

Enter your Race

- Whilkut
- White
- White Bear Band
- White Earth



A



What is your race or origin?

Enter your Race



B



Guideline 27: Place instructions visible on screen always for interviewer- administered surveys

What is your race or ethnicity? You may report more than one group.

Are YOU:

Show screen to respondent after reading the response options.

White

Hispanic, Latino, or Spanish origin

Black or African American

Asian

Middle Eastern or North African

American Indian or Alaska Native

Native Hawaiian or Other Pacific Islander

02:37

A



What is your race or ethnicity? You may report more than one group.

Are YOU:

White

Hispanic, Latino, or Spanish origin

Black or African American

Asian

Middle Eastern or North African

American Indian or Alaska Native

Native Hawaiian or Other Pacific Islander

Some other race or origin

06:45

B



Guideline 28: Place Don't Know/Refused option on the screen for interviewer- administered survey in conjunction with comprehensive training on response entry

What is your telephone number?
We will only contact you if needed for official Census Bureau business.

Telephone Number
([]) - [] - []

Don't know
 Refused

Previous Options Next

A



What is your telephone number?
We will only contact you if needed for official Census Bureau business.

Telephone Number
([]) - [] - []

Options X

Logout	My Work
Language	Don't Know / Refused

Previous Options Next

B

