

Dropdown response options in mobile surveys

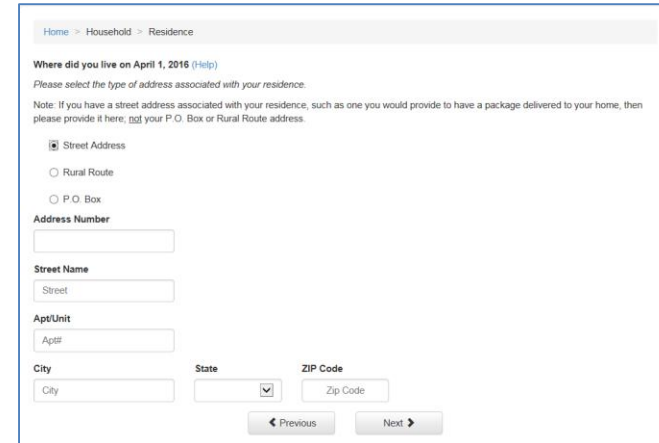
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Dropdown Response Options

- Dropdown response options are used for choose-one questions.
- Often used when there are space limitations.
- Used frequently for long lists like state, year, etc.



Home > Household > Residence

Where did you live on April 1, 2016 (Help)

Please select the type of address associated with your residence.

Note: If you have a street address associated with your residence, such as one you would provide to have a package delivered to your home, then please provide it here. [Get your P.O. Box or Rural Route address.](#)

Street Address

Rural Route

P.O. Box

Address Number

Street Name

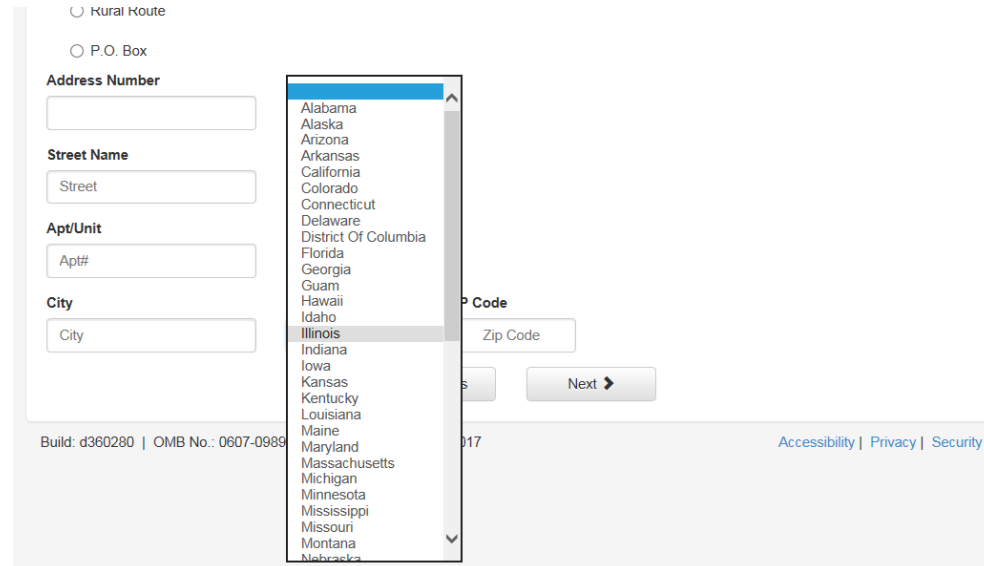
Apt/Unit

City

State

ZIP Code

Zip Code



Rural Route

P.O. Box

Address Number

Street Name

Apt/Unit

City

State

ZIP Code

Zip Code

Build: d360280 | OMB No.: 0607-0989

Accessibility | Privacy | Security

Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District Of Columbia
Florida
Georgia
Guam
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska

Motivation for Studying Dropdowns on Mobile Devices

- Display differently on mobile depending upon device operating system
 - iOS: Spinner or Spin Wheel
 - Android: Similar to PC – pick list
- Quantitative evidence indicates problems with dropdowns on mobile compared to PC
 - Primacy effects, missing data, errors in reporting
 - (Antoun et al., 2017; Antoun 2015; Stapleton, 2013; Peterson et al., 2013)
- Qualitative evidence indicates difficulty using the iOS spinner or Spin Wheel.

Spinner or Spin Wheel

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

Select One

Select One Done

AL - ALABAMA
AK - ALASKA
AZ - ARIZONA
CA - CALIFORNIA

Pick List

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

Select One

Next

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

Select One

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

Next

Radio button/Keyboard

What sex are you?

Male

Female

Next

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

State Done

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

Research Question

Should we recommend using “dropdowns” in surveys accessed via a small mobile device?

General Method

- Quantitative Controlled Study
- Setting: In-person tests at community/senior centers in Washington DC area from Dec. 2016 to Jan. 2017
- Convenience sample
- Participants ages 60-75
 - Had to have at least one year of mobile phone experience
- Procedure
 - Participant completed background paper questionnaire (demographic questions)
 - Test administrator loaded survey app on iPhone 5s, handed phone to participant, instructed him/her to complete survey
 - 3-5 experiments run during 1 hour session

Method for this Experiment

- Self-administered survey app with 12 questions
 - Each question was on its own page
- 30 participants
- Between-subjects design – 3 conditions
 - Spin Wheel; Pick List; Radio button/Typed data
 - 10 participants in each condition
 - Quasi-randomized assignment
 - All 12 questions appeared in their assigned condition
 - Quantitative metrics collected
- Satisfaction and Preference Data collected after survey

12 Survey Questions and their Response Characteristics

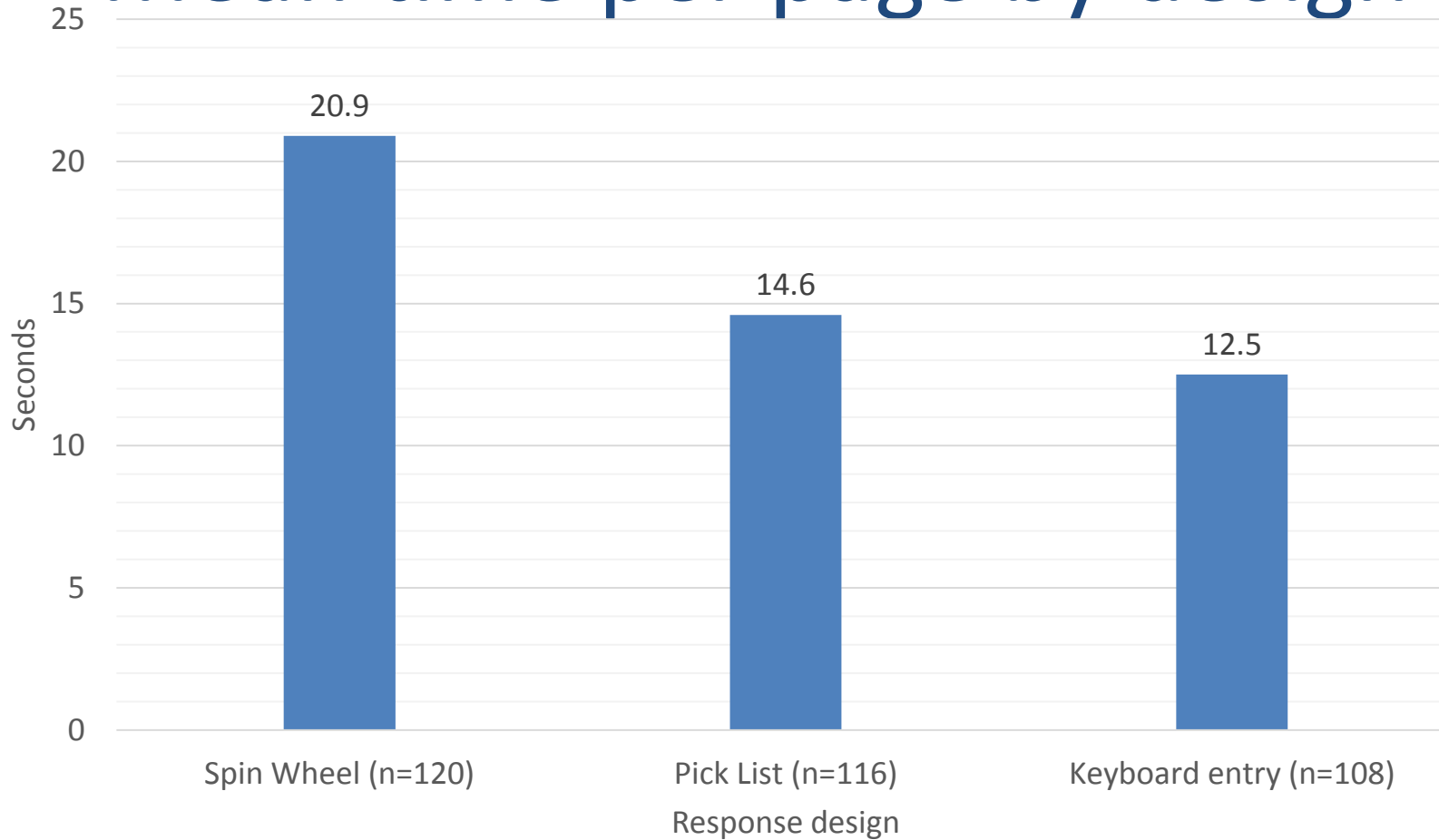
# of Response options	Type of response options		
	Standard	Ordered	Unique
Many (>5 choices)	Date of birth	Age range	Fuel for heating home
	State attended High school	School level obtained	Work status
Few (<=5 choices)	Sex	Eyesight rating	Marital Status
	Citizen of more than one country	Opinion question about salary	Preference about survey mode

Analysis Metrics

- Burden: Time to complete (n=344*)
 - Regression model at the question level, controlling for question characteristics & design condition, and with a random effect for the participant
- Burden: Number of touches on page (n=344*)
 - Regression model at the question level, controlling for question characteristics & design condition, and with a random effect for the participant
- Accuracy (n=28**)
 - Data entered compared to data from background questionnaire
- Satisfaction (n=28**)
 - Participant self-reported responses after completing the survey
- Preference (n=28**)
 - Participant self-reported preference after interacting with all designs for the date of birth question

Burden:

Mean time per page by design



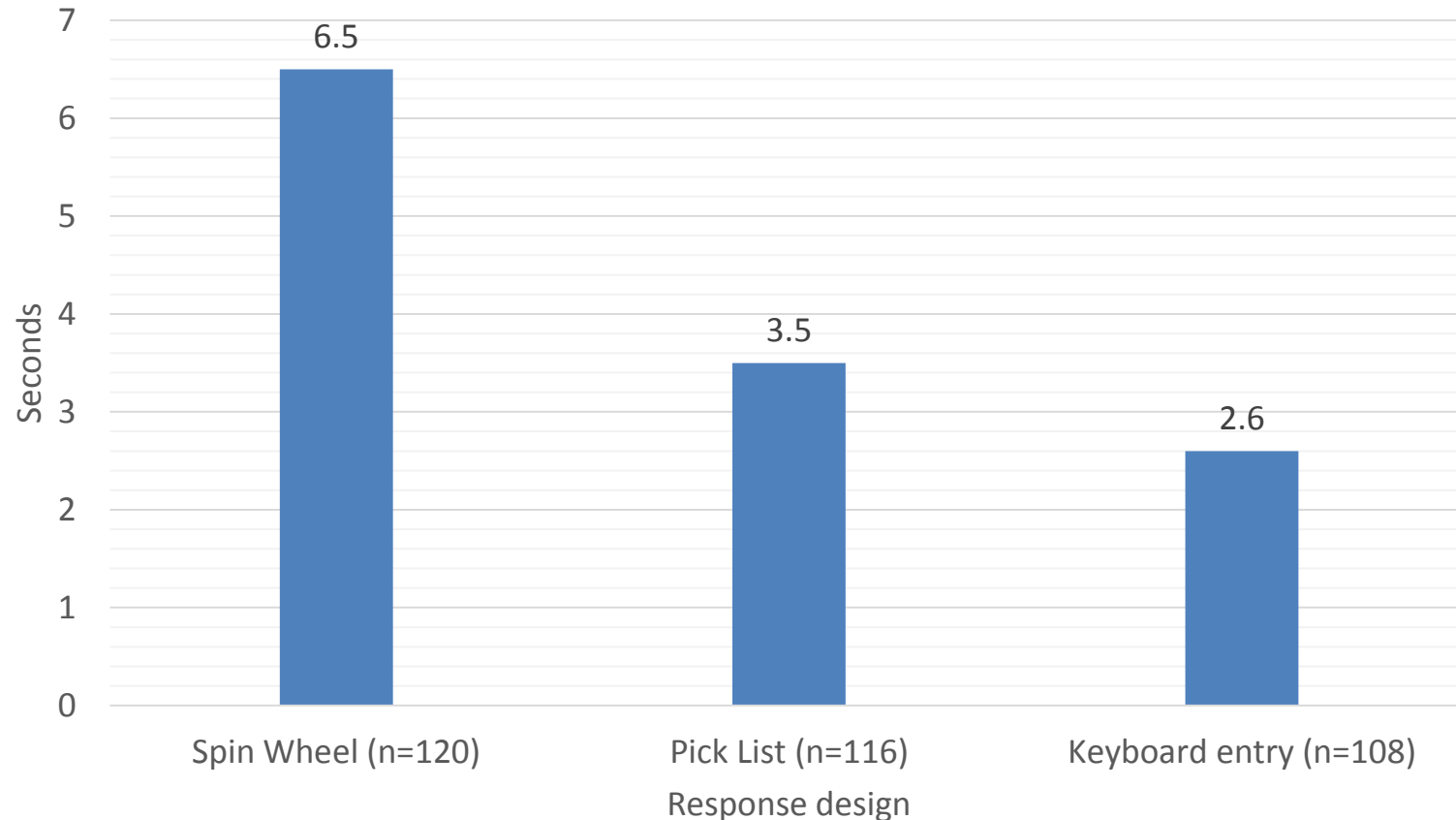
Model results

Slope coefficient for Spin Wheel (vs. Keyboard): 8.3, $p = .02$

Slope coefficient for Pick List (vs. Keyboard): 1.8, $p = .60$

Burden:

Mean touches per page by design



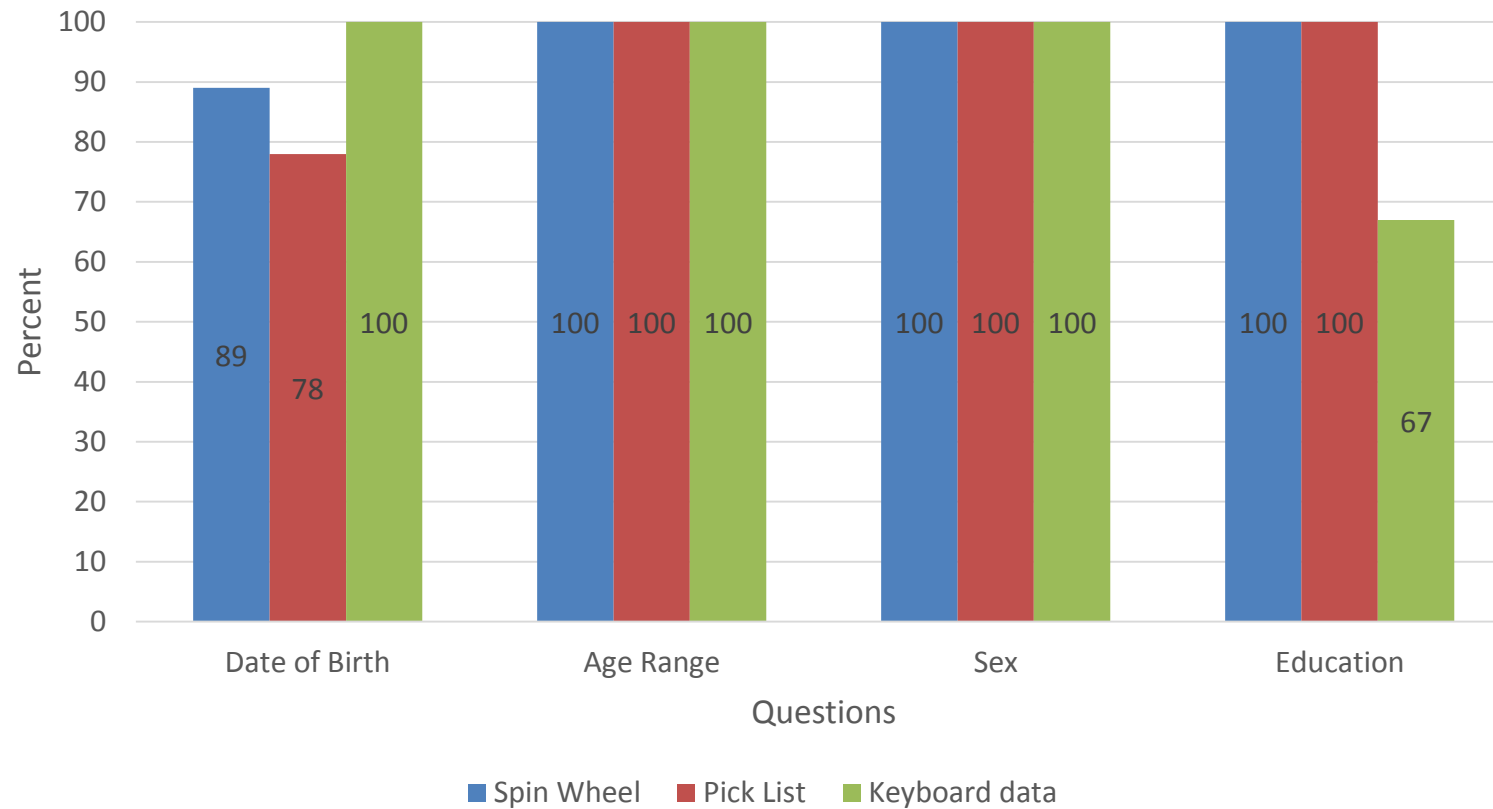
Model results

Slope coefficient for Spin Wheel (vs. Keyboard): 3.9, $p < .0001$

Slope coefficient for Pick List (vs. Keyboard): 0.9, $p = .01$

Accuracy

Percent of participants who answered correctly based on their background questionnaire



Accuracy for Keyboard Entry (Radio Button)

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

No formal school

1st grade

2nd grade

3rd grade

4th grade

5th grade

6th grade

(

Next

The Next button was in a fixed location on all experiments for all conditions. Two people selected 6th grade. Most likely they selected it because they did not realize the list was scrollable. (For one case, it was an error and for the other case, it could have been true, but there was no scrolling.)

Satisfaction questions followed the 12 question survey

How easy or difficult was it to complete this survey?

1 = Very Easy

2

3

4

5 = Very Difficult

Submit

How easy or difficult was it for you to accurately touch your answer?

1 = Very Easy

2

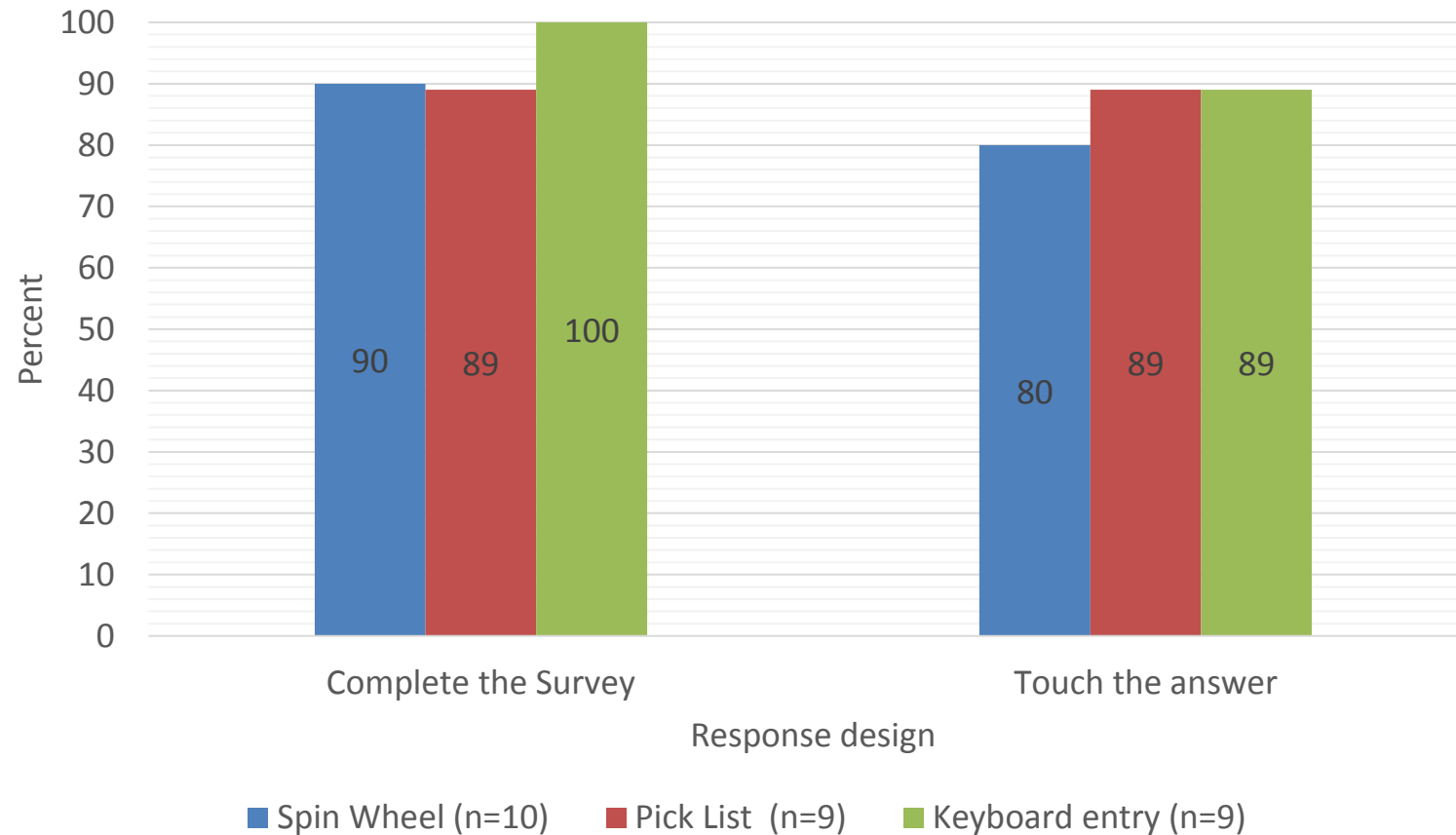
3

4

5 = Very Difficult

Submit

Percent who Reported that it was “Very Easy” to ...



Complete the survey - Overall chi-square test: $\chi^2 = 3.9, p = .40$

Touch the answer - Overall chi-square test: $\chi^2 = 0.4, p = .80$

Preference question for Date of Birth

What is your date of birth?

MM

02-February ▼ DD ▼ YYYY ▼

Done

06-June
07-July
08-August
09-September
10-October
11-November
12-December

What is your date of birth?

MM

DD ▼ YYYY ▼

01-January
 02-February
 03-March
 04-April
 05-May
 06-June
 07-July

Next

What is your date of birth?

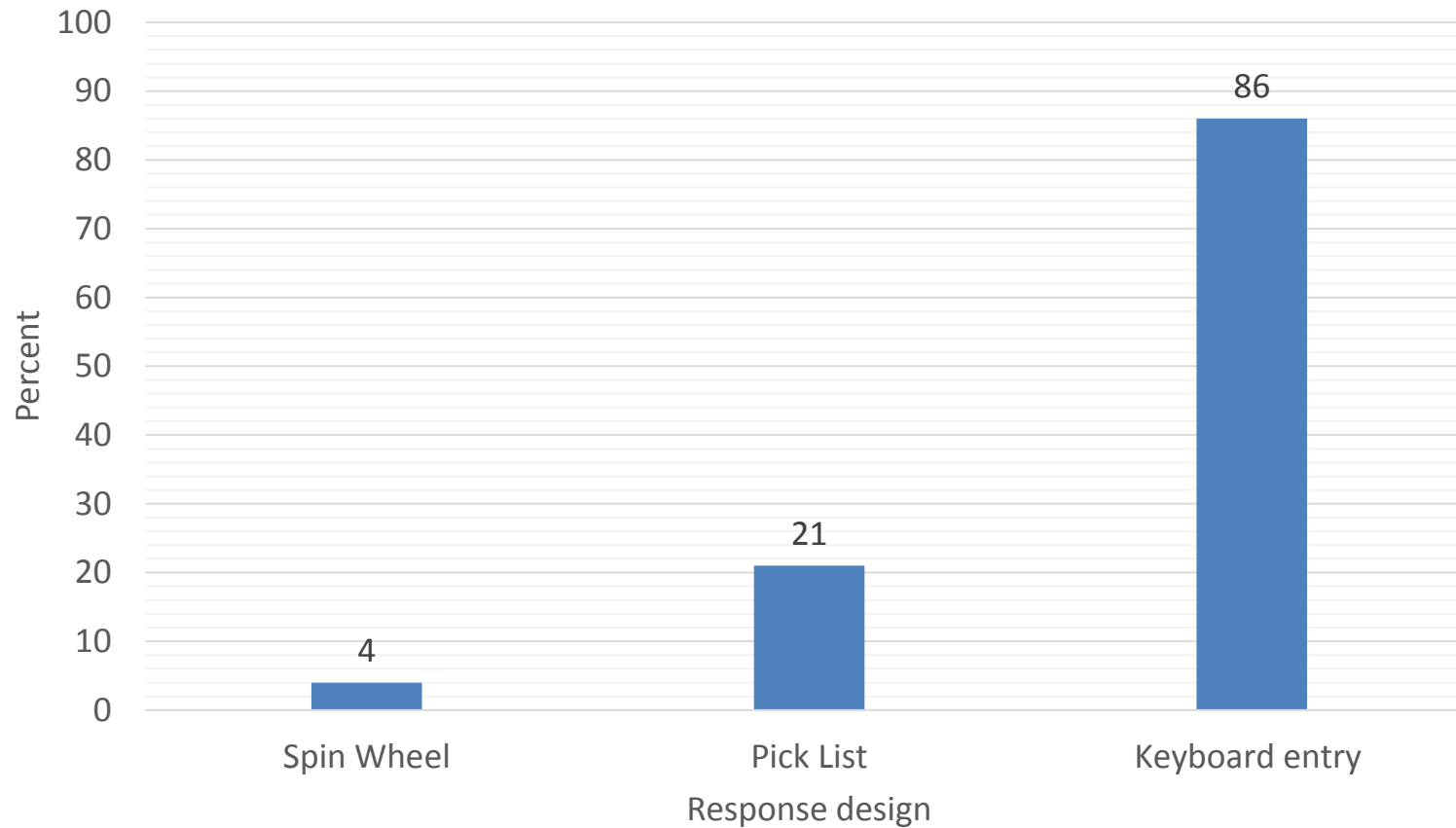
MM

DD YYYY

Done

1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
	0	⌫

For Date of Birth entry, what percent preferred...



Summary of Results

- Spin Wheel takes significantly longer than radio button/keyboard data condition
- No time difference between the Pick List and radio button/keyboard data
- More touches for the Spin Wheel and Pick List than radio button/keyboard condition.
- Accuracy scores were high for all conditions.
- Satisfaction scores were high for all conditions
- Participants overwhelmingly preferred to type their data using a keypad over either the spinner or the Pick List when entering date of birth

Recommendation

Do we recommend using “dropdowns” in surveys accessed via a small mobile device?

- No, if it is the iOS Spin Wheel
 - Confirmed difficulty with iOS Spin Wheel Design for older population
- Maybe, if it is the Pick List
 - More work to investigate Pick List given data quality issues documented in prior literature
- Can a programmer override the iOS framework for Dropdowns when they are needed?

Future Work

- Repeat experiment with different population
- Investigate whether device owned affected results

Questions

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