Italicizing Optional Instructions on Mobile Online Surveys Improves Visual Filtering of Survey Content: An Eye Tracking Study

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Two studies:

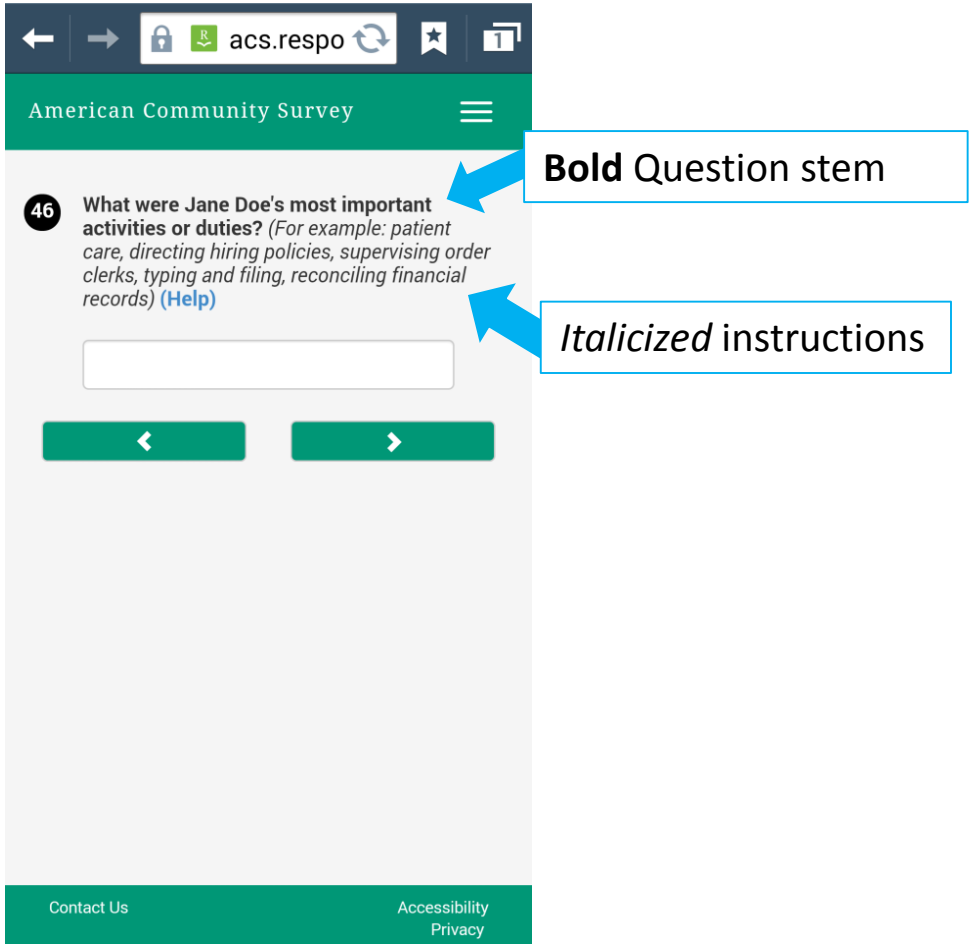
First study: Effect of typographic cues on efficiency and accuracy with which respondents complete a survey on a mobile device

Follow-up study: Incorporation of eye tracking to explore the mechanism through which typographic cues affect efficiency.

What is Typographic Cueing?

- Reveals text content structure through changes in weight, size, case, typeface, etc. (Keyes, 1993)
- Differentiates information categories

- *Use dark print for questions and light print for response choices (Dilman, 2007)*
- *Separate optional or occasionally needed instructions from the question statement by font or symbol variations (Dilman, 2007)*



Motivation

Gap of empirical evidence

- Support of theory.
- Generalization of benefits of typographic cues to mobile interface.

Main research question:

- Does italicizing optional instructions make them more distinguishable?
  - Participants who are presented with optional instructions will have shorter completion time on task because they are filtering out this information.

Methodology

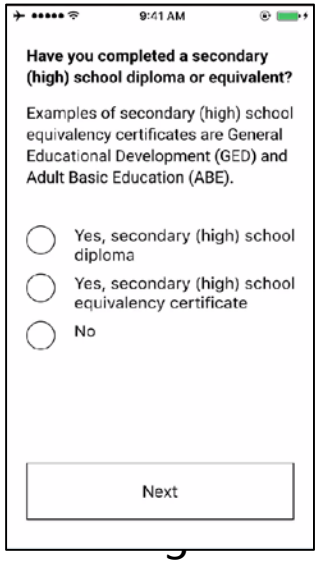
- 2 x 2 Between-subjects design
- 30 participants

- Experimental task:
  - 5 Question survey
    - 4 different conditions
  - **Survey completion time**

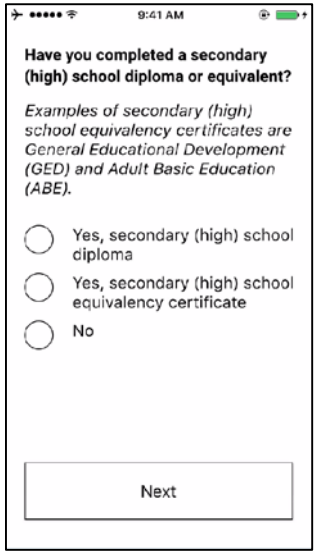
- Word recognition task:
  - 10 words seen in survey
  - 10 words NOT seen in survey
  - **Recognition score**

		Question stem	
		Bolded	Not Bolded (plain)
Instructions	Italicized	**Bolded stem** + *Italicized instructions* (*n* = 7)	Plain stem + *Italicized instructions* (*n* = 8)
	Not Italicized (plain)	**Bolded** + Plain instructions (*n* = 8)	Plain stem + Plain instructions (*n* = 7)

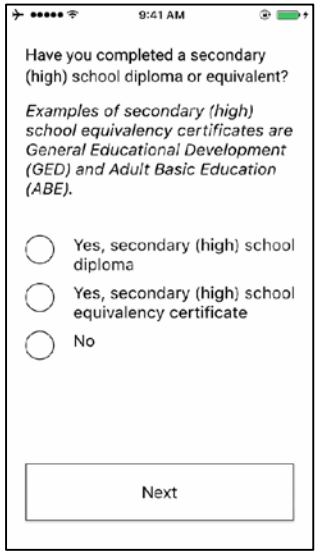
A: **Bold** + Plain



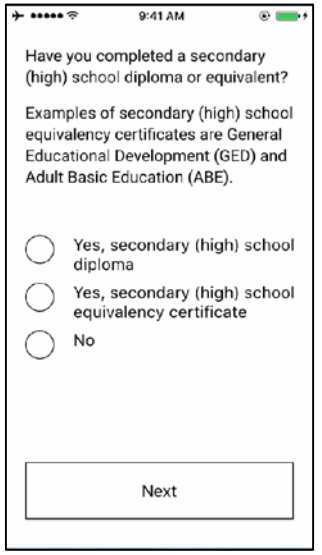
B: **Bold** + *Italics*



C: Plain + *Italics*

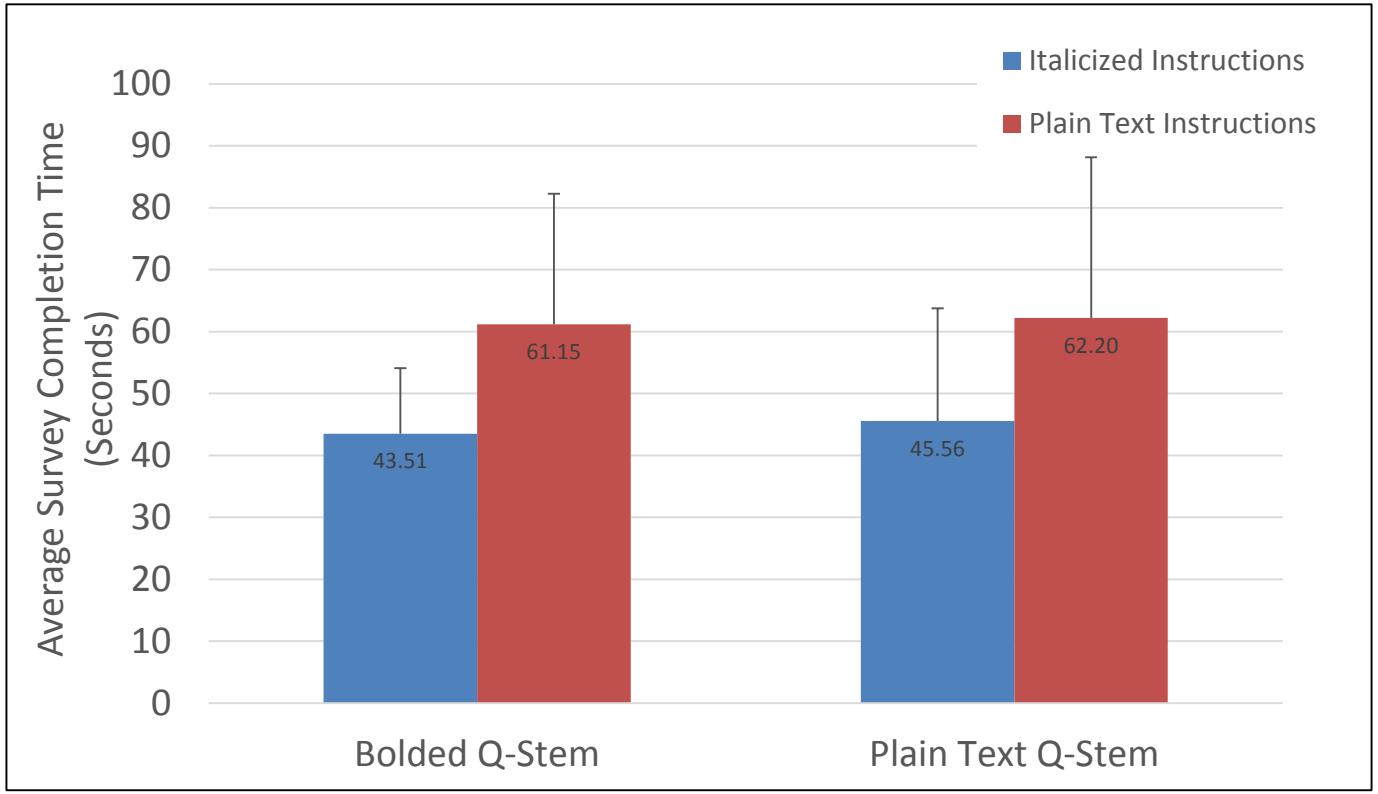


D: Plain + Plain



Survey Completion Time

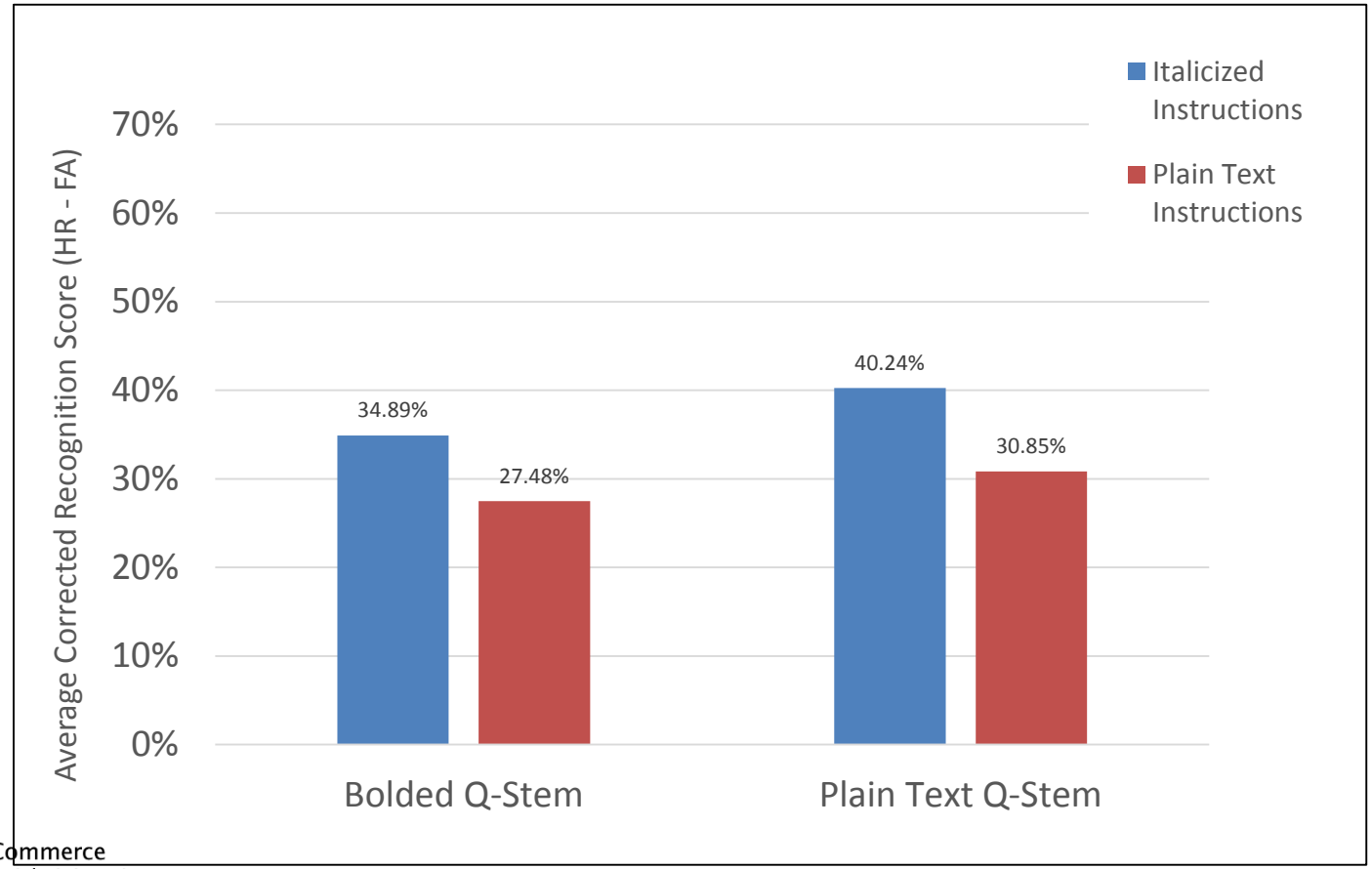
Italicized instructions result in faster survey completion times compared to plain (regular) text.



- Bold – $F(3,26)=.04$, $p = ns$
- Ital – $F(3,26)=4.94$, $p < .05$
- Bold x Ital – $F(3,26)= .00$, $p = ns$

Word Recognition

Neither bold q-stem nor *italicized* instructions significantly affected the amount of words recognized.



- Bold - $F(3,26)= .26$, $p = n.s.$
- Italics – $F(3,26)= .97$, $p = n.s.$
- Bold x Ital – $F(3,26)= .01$, $p = n.s.$

Conclusions and Limitations

- Implementing a typographic cue (italicizing) for optional instructions does result in shorter completion time.
- Utilized an indirect measure of visual attention (word recognition list).
- Could not determine **WHY** individuals who used a survey designed with italicized instructions were faster.

Follow-up Experiment
Research question and hypothesis

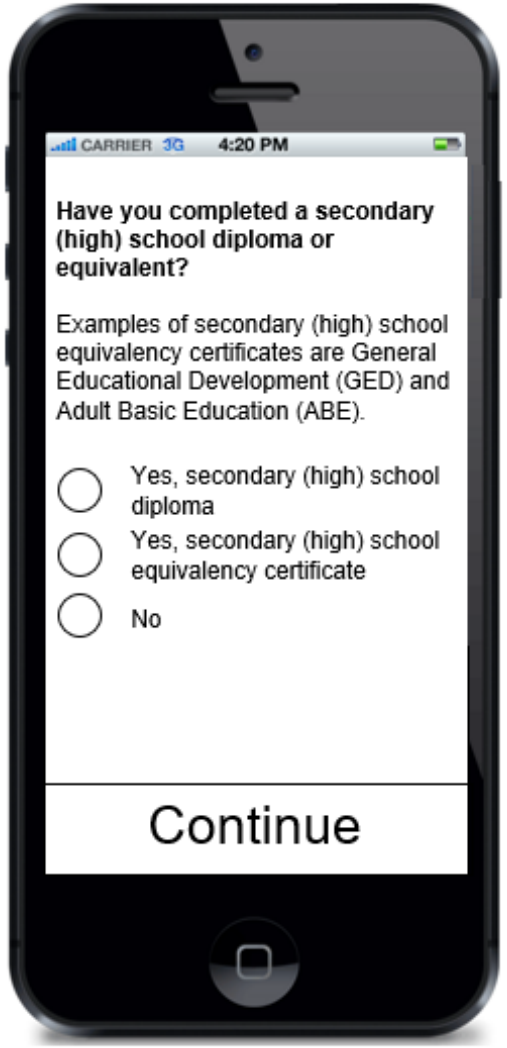
– **WHY** did individuals who used a survey designed with italicized instructions complete surveys faster?

  - Italicized optional instructions results in lower visual attention and faster survey completion times

– Use a direct measure of visual attention by incorporating eye-tracking methodology

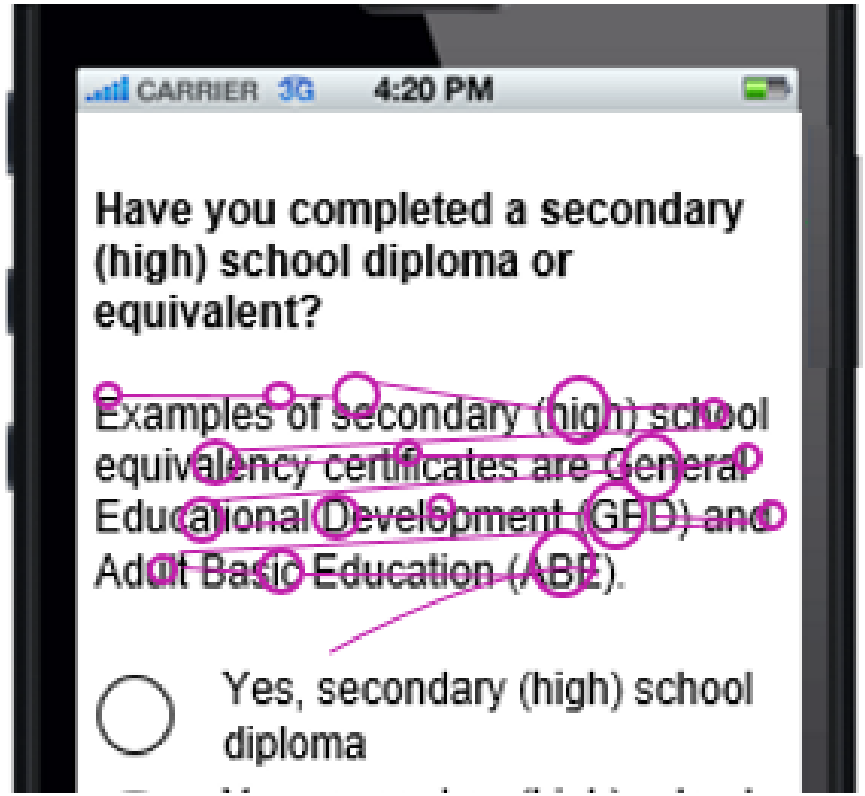
Methodology

- Participants: 16 Census Bureau Employees or Contractors
  - Setting: In-person tests at Census Bureau Headquarters in Suitland, Maryland
- Task: Simulated Mobile Survey on PC using Interactive PowerPoint
  - Same 5 survey questions from previous behavioral study
- Between-subjects design: 2 conditions
  - Italicized Instructions VS Plain Text Instructions



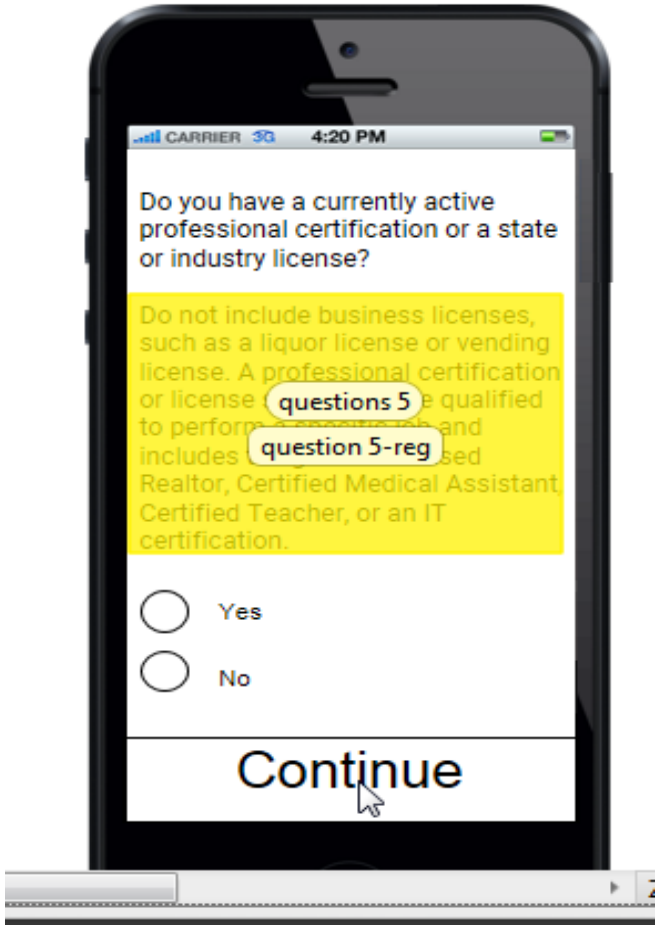
Eye Tracking Metrics and Analysis

- Metrics:
  - Total Fixation Duration
  - Fixation Count



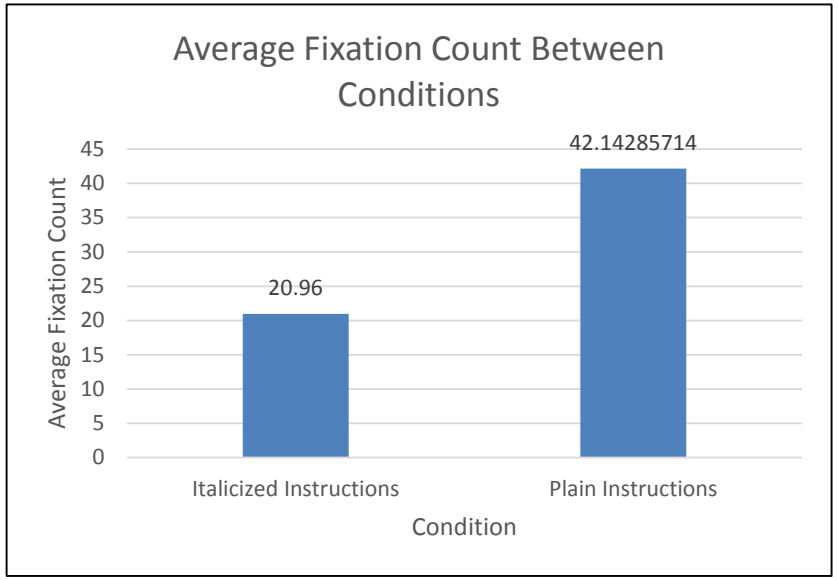
Eye Tracking Metrics and Analysis

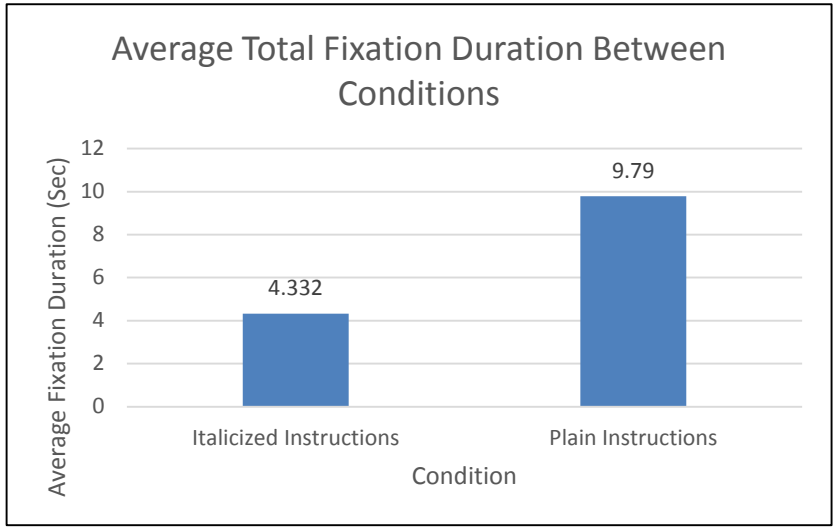
- Analysis:
  - Area of Interest (AOI) Analysis:
    - Defined visual area for instructional text for each survey question. Captures metrics within this AOI
  - Summed total fixation duration and fixation count across all five survey questions for each participant



Preliminary data: Fixation Count and Total Fixation Duration

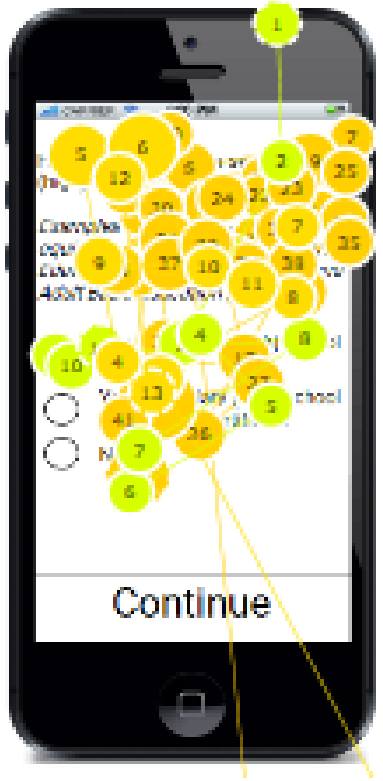
- Results:
  - Average Fixation Count was nearly double when the instructions were plain text
  - Average Total Fixation Duration was nearly double when the instructions were plain text



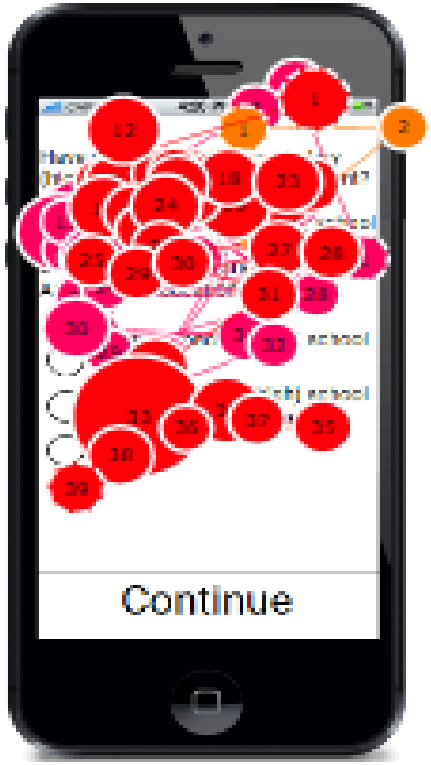


Gaze Plots

- Gazeplots:
  - Gaze path and fixation duration for 3 participants from both conditions on the final survey question
  - Much more time was spent reading the instructions in the plain text group



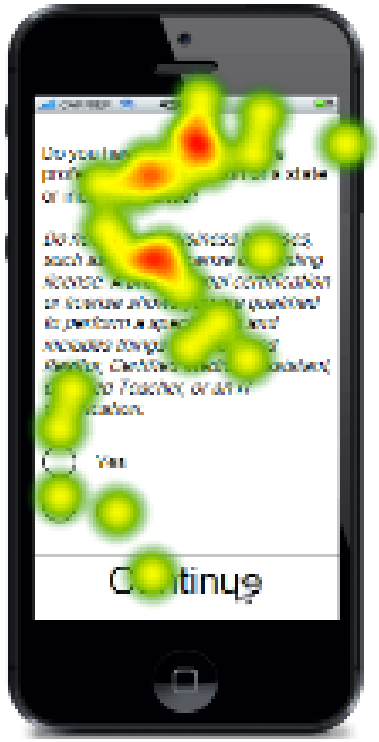
Italicized Instructions (n=3)



Plain Instructions (n=3)

Heatmaps

- Fixation Count Heatmaps:
  - There is a clearly larger area of the instructional text being attended to by participants who saw plain text instructions



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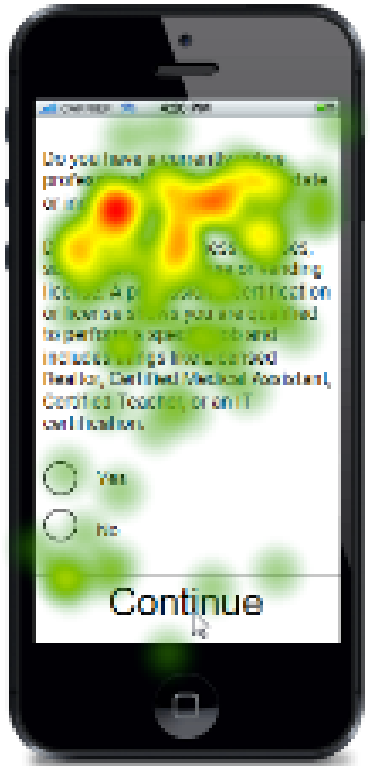
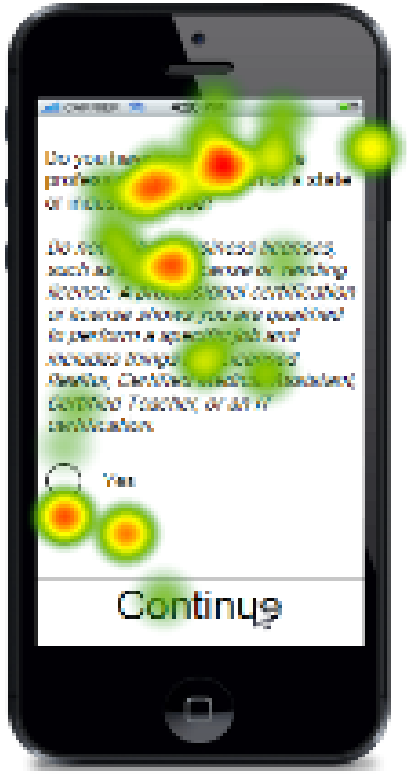


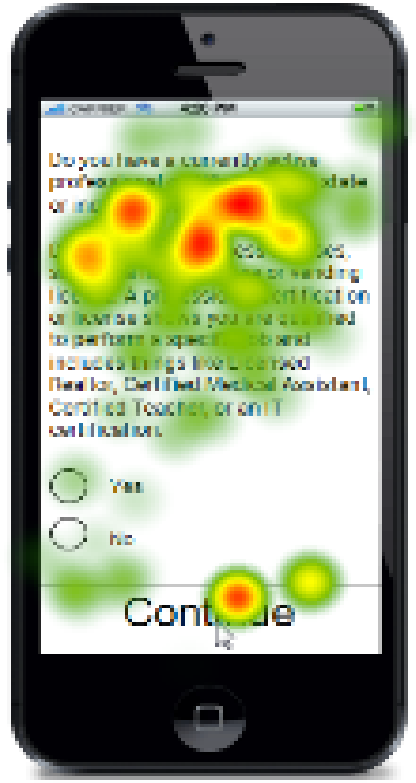
Plain Instructions (n=3)

Heatmaps

- Fixation Duration Heatmaps:
  - There seems to be more time being spent fixating on the area of the instructional text being attended to by participants who saw plain text instructions vs italicized instructions



Italicized Instructions (n=3)



Plain Instructions (n=3)

Conclusions from preliminary data

Theoretical implications:

- More time is spent reading the instructional text in the plain text condition
  - This supports the theory that information deemed unneeded by the respondent is being visually filtered or skipped when text is italicized.

Practical implications:

  - Evidence that typographic principles are applicable to mobile design.

Incorporating eye tracking to the design allowed us to directly observe the source of a cognitive benefit afforded by a design using typographic cues.

Acknowledgement

- Chistopher Antoun
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