

Surveys on Mobile Devices: Opportunities and Challenges

Mick P. Couper

Survey Research Center, University of Michigan, and
Joint Program in Survey Methodology, University of Maryland

Web Surveys for the General Population: How, Why and When?
London, February 2013

**“There are known knowns; there are
things we know we know.**

**We also know there are known
unknowns; that is to say, we know there
are some things we do not know.**

**But there are also unknown unknowns –
the ones we don’t know we don’t know.”**

(Former U.S. Secretary of Defense, Donald Rumsfeld
February 12th, 2002)

Background and Focus

- Focus of this talk: mobile Web
- Different uses of mobile devices in surveys
- Designing for mobile Web
 - Technical approaches
 - Research evidence
- Nonresponse and breakoff
- Understanding how mobile is different – issues in designing for mobile Web
- Summary and conclusions

Background: Smartphones and Mobile Web

- Rapid rise in penetration of smartphones and tablets
 - In terms of instrument design, these should be viewed as a continuum (PC → laptop → large tablet → small tablet → smartphone, rather than a dichotomy (PC vs. mobile)
- Increasing use of these devices to connect to the Internet, sometimes as only means of access
- But access and use of mobile Internet devices still far from universal
 - See next slides

Some Data on American Adults

- Pew Internet and American Life Project
- As of January 2013:
 - 26% own an e-reader
 - 31% own a tablet computer
- As of December 2012:
 - 87% have a cell phone
 - 45% adults have a smartphone
 - 65% of those age 18-29, 12% of those age 65+
 - 61% of college educated, 22% of high school dropouts
- UK estimates (Ofcom, December 2012):
 - 92% of adults have cell phone, 41% have a smartphone

Internet Use Among Cell Phone Users

- Pew Internet and American Life Project survey, March-April 2012
- Among cell phone users:
 - 45% don't go online using cell phone
 - 33% use Internet on phone, but mostly use other device to go online
 - 5% use both equally
 - 17% go online mostly on cell phone
- According to Ofcom (December 2012), the UK leads the world in mobile Internet use

Broad Approaches to Mobile Data Collection

- Use of mobile Web for new methods of data collection
 - E.g., ecological momentary assessment (EMA), diary studies, travel studies, health monitoring
 - Often based on volunteers, who often have to download and install an app
 - Often restricted to users of a particular device, or device provided to small group of users
 - E.g., work on the LISS panel
- Completion of Web surveys on mobile Web devices
 - Designing surveys that are completed by some on mobile devices
 - Hope that it may increase coverage or reduce nonresponse, without affecting data quality
- My focus here is on the latter

Completion of Web Surveys on Mobile Devices

- The proportion of respondents completing surveys on mobile devices appears to vary by population and type of survey
- Example estimates:
 - Tourangeau et al. experiments: <1% of opt-in panel members used non-standard devices
 - Peterson (2012): use of smartphones in consumer surveys range from 3% (credit card users) to 30% (mobile telecom subscribers)
 - Comer and Saunders (2012): about 8.5% of US respondents used mobile device
 - Pearson and Veling (2012): in 4 consumer markets, 4.6% used smartphone, 2.3% used tablet
 - Guidry (2012): 3.8% of college students started on smart phone and 0.38% started on tablet
 - McClain et al. (2012): 6.5% of college students started on smart phone
 - Macer (2012): estimate of 6.7% across companies surveyed, and 2.7% for Confront surveys in 2011
- While still relatively low, these proportions will likely continue to rise

Dealing with Mobile Web Users

- A number of different solutions are possible*:
 - 1) Do nothing: let them try to complete the survey on their mobile device
 - 2) Detect and exclude them from the survey
 - 3) Detect and encourage them to use a regular browser
 - 4) Detect and adjust the survey using an app-based approach
 - 5) Detect and adjust the survey using a mobile browser solution
- Each of these approaches has advantages and disadvantages
- The first and last options above are most common for general population Web surveys
- The research approaches mirror these alternatives

Research on Data Quality in Mobile Web Surveys: Four Broad Approaches

- Case studies, descriptive studies, review papers
 - Many presentations, mostly unpublished
 - E.g., Atkinson & Conry (2011); Okazaki (2007)
- Compare responses from those who choose mobile devices for regular Web surveys (option 1)
 - E.g., Guidry (2012); McClain, Crawford, & Dugan (2012); Peterson (2012)
- Random assignment to different designs among mobile Web users
 - E.g., Peytchev & Hill (2010); Stapleton (2011); Wells, Bailey, & Link (2012)
- Random assignment of screened panelists to mobile Web or PC Web (options 4 or 5)
 - Zahariev, Ferneyhough, & Ryan (2009); Buskirk & Andrus (2012); Mavletova & Couper (2013); Wells, Bailey, & Link (2012);
- Selected examples reviewed below

Guidry (2012)

- Student survey (NSSE) on multiple campuses in US (n>530,000)
- Compares data quality of those who completed non-optimized survey on mobile Web versus tablet and regular PC
 - Lower rates of item missing data on smartphone than PC (0.53 vs. 0.80, $p<.05$)
 - Suggestion of more non-differentiation (i.e., more straightlining) on smartphones

McClain, Crawford, and Dugan (2012)

- Student survey (MSL) on multiple campuses in US (n>100,000)
 - 6.5% logged in using mobile device
- Compare data quality of those who completed non-optimized survey on mobile Web versus tablet and regular PC
 - No differences in item missing data rates
 - Higher level of straightlining on smartphones (significant for 6/6 grids)
 - Responses skewed toward left end of (horizontal) scales

Peterson (2012)

- Analysis of those who complete regular Web surveys on mobile devices across a number of studies
- Survey consistently longer (by 25% – 50%) on mobile
 - Appears to be related to network latency rather than survey complexity or response latency
- No differences in satisficing
 - Similar number of selections in select-all-that apply questions
- Open-ended questions
 - Shorter answers but similar content (auto-coded)
- Small but significant differences in distributions on response scales for about 1/3 of questions measured

Summary So Far

- Few comparisons of those completing (non-optimized) Web surveys on smartphones vs. regular browsers
- Few differences in data quality reported
- But, these comparisons are potentially subject to selection bias
 - Those who choose to complete on smartphones are more motivated and more familiar with devices
- Next we examine some randomized experiments

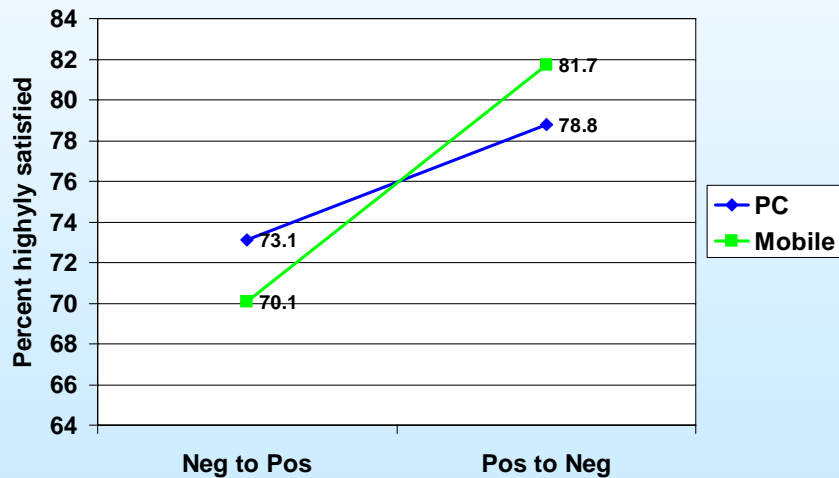
Peytchev and Hill (2010)

- Recruited small sample (n=92) locally for mobile panel
- Provided panelists with smartphones (Samsung Blackjack)
- Experiments with alternative formats of questions
 - Low vs. high response scale
 - Question order experiment (norm of even-handedness)
 - Effect of images on responses
 - Single vs. multiple questions per page
 - Vertical vs. horizontal response scales
 - Closed vs. half-open (other, specify) questions
- Generally found few effects, although information that required scrolling was less often utilized, and avoidance of “Other, specify” responses

Stapleton (2011)

- Optimized platform for mobile surveys
- About 6% of sample (n=132,242) responded on mobile device
- Randomized those (n=7,923) to 4 different scenarios
 - Full vs. reduced survey, more vs. less paging, vertical radio buttons vs. drop down lists
- Key findings:
 - With horizontal scales, mobile respondents are more likely to select left-most (visible) scale points (see next slide)
 - With vertical scales and drop boxes, no differences by device

Effect of Horizontal Scale Order by Device



Wells, Bailey, and Link (2012)

- Pre-screened panelists in US randomly assigned to mobile Web or PC Web (n≈700 completes in each)
- Used mobile app (Techneos' SODA)
 - Panelists required to download app
- Random assignment to 2 different question forms
 - Low vs. high response scale
 - Randomized vs. alphabetized response lists
 - Closed vs. half-open (other, specify) questions
- Key findings
 - Failed to replicate Peytchev & Hill (2010) on closed vs. half open questions
 - No primacy effects by mode
 - Larger text box produces longer answers on both types of devices

Summary So Far

- Few studies involve randomizing smartphone users to different versions of optimized designs
- These studies yield few replicable results
- Horizontal scrolling seems to be an issue (as for regular Web)
- Text entry may depend on input method and respondent familiarity with device
- We next examine random assignment to mobile Web vs. PC Web

Zahariev, Ferneyhough, and Ryan (2009)

- Pre-screened panelists in Canada randomly assigned to mobile survey (n=500) or regular online survey (n=500)
- Found similar response distributions to different question types

Buskirk and Andrus (2012)

- Pre-screened panelists in US with iPhones randomly assigned to complete survey on iPhone (app-like survey in browser; n=982) versus computer (n=328)
- Found few significant differences in response distributions

Mavletova and Couper (2013*)

- Pre-screened panelists in Russia assigned to both PC and Mobile Web surveys in randomized cross-over design
 - 884 respondents completed both waves, using each device type
- Browser-based solution optimized for mobile Web (Kinesis)
- Focus on response to sensitive questions and context
- Key findings:
 - Mobile Web took twice as long on average than PC Web
 - Mobile Web respondents report lower rates of alcohol consumption and monthly income
 - No significant differences in attitudes toward deviant practices, deviant behaviors, and alcohol-related behaviors
 - See next slide for context differences

Context Variables

	Mobile Web	PC Web	$\chi^2, df=1$
Survey completed outside the home	44.9%	29.0%	48.28***
Other persons present during completion of survey	29.2%	16.1%	43.48***
Trust in confidentiality of the survey mode	62.8%	74.8%	29.59***
Felt that questions were sensitive/very sensitive	56.7%	63.5%	8.49**
Feeling uneasy/very uneasy answering the questions	21.9%	24.4%	1.54 (n.s.)
N	884	884	

*p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed)

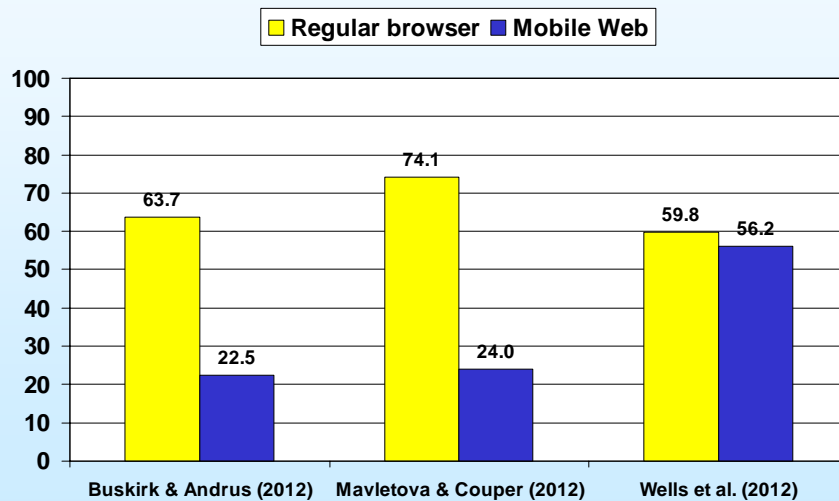
The Story So Far ...

- Relatively few respondents choose to use smartphones to complete Web surveys
 - But, this is likely to increase
 - Discouraging them from doing so doesn't seem to work
 - Need to optimize surveys for these respondents
- The good news: as long as care is taken in design, there appear to be few (reliable) differences in responses to mobile Web and regular Web
- But ... we turn next to nonresponse and breakoffs

Nonresponse in Mobile Web

- Evidence that response rates may be lower for mobile Web than PC Web, even when surveys are optimized for mobile devices
 - Sometimes significantly and substantially so
 - Even following extensive pre-screening
 - See next slide
- Mavletova and Couper (2013): those who do not respond to mobile Web are...
 - Less frequent mobile Web users
 - Those with feature phones rather than smartphones
 - Those who use wi-fi connections rather than cell
 - Those with less interest and motivation

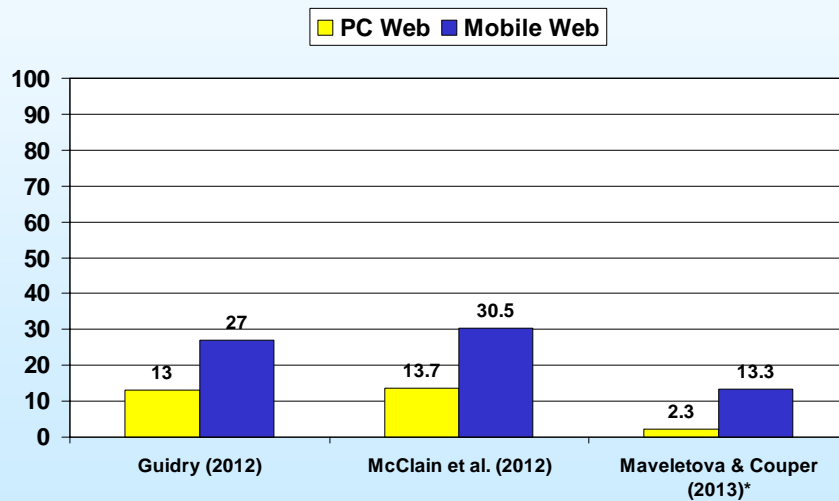
Completion Rates for Regular Browser and Mobile Web



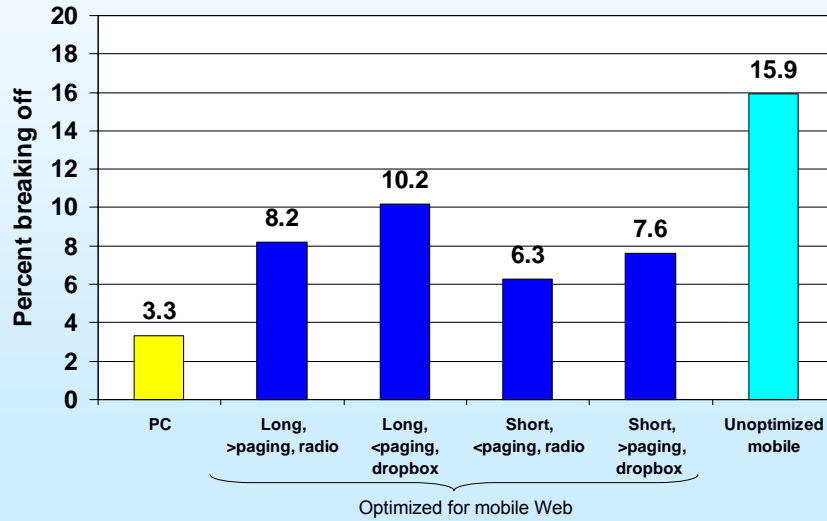
Breakoff Rates in Mobile Web

- Consistently higher breakoffs on mobile Web
 - Peterson (2012): all 17 surveys examined had higher breakoff on mobile Web
 - See next slides
- Breakoffs appear to occur in same places as regular Web and in similar proportions
 - Peterson (2012)
 - Mavletova and Couper (2013)

Percent Breaking Off by Type of Device



Breakoff Rates by Device and Version



UNIVERSITY OF MICHIGAN

Source: Stapleton (2011)

29

Conclusions

- Respondents are increasingly completing Web surveys using mobile devices (especially smartphones)
- There seems to be little benefit of doing so for them or for us
 - Response rates are lower
 - Breakoff rates are higher
 - Completion times are longer
- But – among those who complete surveys on mobile Web – the effects on data quality appear to be minimal, especially when the survey is optimized for smartphones
- There is much we still don't understand about mobile Web use and nonresponse to mobile Web surveys
 - See next slide for some considerations

UNIVERSITY OF MICHIGAN

30

Issues in Designing for Mobile Web*

- Technology features
 - Display dimensions and orientation
 - Input mode (touchscreen, keyboard, stylus)
 - Bandwidth and connectivity (speed, reliability, and type)
 - Software: browser vs. app vs. hybrid
- User characteristics
 - Comfort, familiarity with device
 - Willingness, motivation, and interest
 - Alternatives available and choice of device
 - How device is used, and for what (consumption vs. production)
 - Cost and type of data plan (restriction on use)
 - Shared use of device
 - Invitation mode (e-mail vs. SMS vs. app prompt)
- Context of use
 - Location: safety, distractions, presence of others
 - User behavior: multi-tasking (on device and between device and other activities), interstitial activities, time on task

Optimizing for Smartphones

- General suggestions based on limited research evidence:
 - Avoid grids
 - Short question text and number of response options
 - Avoid long horizontal scales; vertical scales better
 - Limit requirement for typing/text entry
 - Minimize images, and other high bandwidth requirements
- Still many unknowns

Thank You