Contents lists available at ScienceDirect

Telematics and Informatics
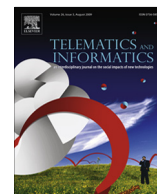
Should participants be given a mobile phone, or use their own? Effects of novelty vs utility

Erin I. Walsh [a,*], Jay K. Brinker [b]

[a] *The Australian National University, Australia*
[b] *Swinburne University of Technology, Australia*

A B S T R A C T

Due to their ubiquity, mobile telephones may herald a great opportunity for ecological momentary assessment data collection. To access samples which do not own a mobile, or do not own a mobile that supports the preferred mode of response (i.e. apps), researchers may wish to provide participants with an appropriate mobile telephone for the purposes of participation. This often involves replacing a phone already in use. This study investigated the impact of providing a mobile telephone to participants for the purposes of participating in research, comparing the response behaviour of participants using their own mobile telephone against those using one provided by the researcher. Using iPhone 3s, 179 undergraduate participants completed a six-item questionnaire, 20 times over 2 day via app or text message. The three experimental groups consisted of those using their own iPhone, those using their own SIM in a provided iPhone, and those using a provided SIM in a provided iPhone. Results suggest that researchers seeking to conduct self-report research using mobile phones should be aware that the choice to provide a mobile telephone to standardise participant response platforms can impact on response behaviour.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

There are an estimated 96 mobile subscriptions per 100 people globally (International telecommunication union, 2014). Mobile technology offers an unprecedented method of bidirectional communication between practitioners, clients, researchers and participants, through text-only technologies like Short Message Service (SMS) available on all mobile telephones, and mobile software (apps) and internet connectivity offered by smartphones. The past few years have seen a proliferation of physical health (see Boulos et al. (2014), Joe and Demiris (2013), Mars (2013)) and mental health (see Aggarwal (2012), Proudfoot (2013), Shingleton et al. (2013)) interventions centred around mobile technology. Researchers too are beginning to capitalise on mobile technology as a mode of self-report data collection in psychological research (see Kuntsche and Labhart (2013)). When using mobile telephones in this way, it may be necessary to provide participants with a mobile telephone, either because they do not have one, the mobile they do have might be unsuitable for participation, or the researcher wants to standardize the research experience.

If a potential participant does not have a mobile, researchers may ask them to borrow someone else's mobile for the purposes of participation (e.g. Lagerros et al. (2012)), or switch to a different method of data collection (e.g. Macedo et al.

---

* Corresponding author at: Room 218, Research School of Psychology, Building 39, Science Road, The Australian National University, Canberra, ACT 0200, Australia.

E-mail addresses: erin.walsh@anu.edu.au (E.I. Walsh), jbrinker@swin.edu.au (J.K. Brinker).

(2012)). The most common approach is to exclude participants without mobiles from data collection, either by using mobile telephone number registries for initial contact and recruitment (e.g. Bexelius et al. (2009), Chib et al. (2012), Gold et al. (2011), Lim et al. (2010)), or excluding non-mobile owners after initial contact and screening (e.g. Axén et al. (2013), Devine et al. (2014), Suffoletto et al. (2011)). Whilst this approach is generally tenable due to a relatively high saturation of mobile ownership worldwide, it can be problematic with specific populations, such as adults in rural or developing areas, and children.

There are few examples where adult participants in a developed country were given the option to borrow a mobile if they did not own one, or did not wish to use their own for the purposes of participation (e.g. Berkman et al. (2011)). Historically, participants in developing countries are unlikely to own mobile telephones, and so researchers have provided them one (e.g. Andreatta et al. (2011), Lori et al. (2012)). As global mobile penetration increases, and mobile ownership even in poorer areas is becoming more common, research with children has become the primary area where mobile telephones are given to participants. This is done by either providing a mobile directly to the child (e.g. Alfven (2010), Bauer et al. (2010), de Niet et al. (2012)) or to the parent or caregiver (e.g. Broderick et al. (2012), Chen et al. (2012), Kazi et al. (2014)). This approach may facilitate data collection, but purchasing mobile telephones (particularly smartphones) can be costly, and requires personal contact with the participant to hand over the mobile telephone. The cost and need to physically meet participants means lending mobile handsets may not be viable for large scale studies.

The ubiquity of mobile phones has shifted the issue from whether participants have mobile telephones to the type of mobile telephones they have. In Australia, there are 130 mobile phones per 100 citizens (ACMA, 2011), 64% of which are smartphones (ThinkInsights, 2014). Though almost all mobile telephones support SMS, it is considerably more difficult to type an SMS response using the multi-press numeric keyboard system of a cell phone than the alphanumeric touchscreen of a smartphone. Further, cell phones do not support apps, mobile telephone specific software common on smartphones. A researcher may need to provide a smartphone to a cell phone user for the purposes of data collection (e.g. as in Irvine et al. (2012)). However, even where there is high smartphone penetration, a researcher seeking to use a particular app may still have difficulties depending on the type of application they wish to use.

Whilst SMS works across different mobile brands and phone platforms, apps commonly have compatibility with a particular operating system (e.g. Android or iOS). Though there is an impetus toward cross-brand app development (Ribeiro and Da Silva, 2012), with some cross platform survey software (such as *QuickTapSurvey;* QuickTap Survey, 2014) the end user experience is often different due to differences in design and layout. Even with very similar mobile phones, people can have markedly different end user experiences in terms of ease of use and speed with which menu navigation can be achieved (Keijzers et al., 2008). In terms of psychological research, studies on paper and online surveys note that response behaviour is modified by implicit visual layout cues (Dillman et al., 2009; Smyth and Dillman, 2006), which are to some degree dictated by the size of a device.

In self-report research, size does matter. In paper surveys, a smaller page size is associated with lower response rates than larger page counterparts (Jansen, 1985). For online instruments, compact question spacing can make instruments more difficult to read and engage with (Smith, 1995). The spacing of questions also impacts on response length. In paper and online surveys, larger response areas prompt longer responses than smaller response areas (Dillman et al., 2009), and shorter and more clearly delineated response areas beget more precise responses (Fuchs, 2009). Whilst it can be expected a cell phone screen will be small (typically under 7 cm across the diagonal), smartphone display sizes can differ drastically. There is also the mechanical difficulty of response composition. Aside from a general impact of mobile screen size on usability, with smaller screens being generally more difficult to use (Chae and Kim, 2004), touch screen key size is significantly associated with the speed and accuracy of use (Park and Han, 2010). The more difficult it is to type a response, the more burdensome responding becomes, and response burden is closely associated with response rates and attrition (Bolger et al., 2003).

Providing participants with a mobile phone for the duration of data collection to standardize the response experience is not an entirely new phenomenon. However, the mobile phone ownership landscape has drastically changed in recent years, and there are to date no structured investigations of the ways in which lending participants a mobile telephone (rather than having them use their own phone) may impact upon their response behaviour. One major issue is that, with the majority of the global population actively using a mobile telephone, lending a mobile telephone to a participant will likely involve replacing one already in use (as was the case in Irvine et al. (2012)).

In this scenario, using the provided mobile is a novel experience for the participant. In general, novelty motivates people to engage with an experience (Berlyne, 1950), and indeed, novel modes of participation can increase engagement with research (Dillman et al., 2009). In a review of email survey response rates over time, Sheehan (2006) posited that the trend of participants providing more detailed, lengthy responses when email was a relatively new technology, relative to later years when email was more established, was due to the novelty of the technology. It may be that providing participants with a novel mobile phone might impact on responses, perhaps encouraging longer and more detailed responses by engaging participants by way of novelty. However, providing a mobile telephone to a participant raises a consideration beyond the handset itself.

For some phones the telephone number, contacts, and other data is associated with the SIM card inside the handset. The researcher must consider whether they provide both the handset and SIM card, or whether the participant ought to transfer their own SIM card into the new handset. If a participant can use their own SIM card in the novel handset, their friends, family and colleagues can still contact the same number whilst they participate in the study. By retaining their own SIM, they can use the provided handset as they would their own mobile. Alternately, if a participant is provided with a SIM, the new