



Mobile Technology and Everyday Living: Case Study of the Impact of Mobile Devices on People with Learning Disabilities in Brazil

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Abstract— *Internet-enabled ‘Smartphones’ are becoming ever more used by people with Learning Disabilities (LD) for entertainment, to socialise and enjoy self-expression. Despite this, there is a paucity of research into the experiences of this cohort in using this technology, the barriers they may encounter or the benefits accrued. The study to be presented addresses this gap by exploring the issues via in-depth group and individual interview and observation with 11 adults (aged 17-40) in a case study at a Day Centre in Belo Horizonte, Brazil, for People with LD. Interviews were content-analysed to elicit themes such as expressions of self-advocacy; information-seeking, barriers to use etc. Usability issues were also explored by participatory observation of device usage during individual interviews. From such an examination, a rich picture emerged of the part mobile digital technology plays in the lives of this cohort in Brazil. As the study formed part of a much larger one based in the UK, having similar aims, objectives and methods, results are compared to those being gathered for the UK-based research, to explore any cultural or social differences that may affect the impact of mobile devices on the lives of people with LD.*

Keywords— *Learning disabilities, mobile technology, smartphones, Brazil, benefits, barriers*

I. INTRODUCTION

Although Brazil has the tenth highest social and economic inequality in the world [1] use of smartphones is a widespread reality even among poorer layers of the Brazilian population. In restaurants, shopping malls, and public places in general one can see people operating their cell phones, no matter what their age or social class [2]. Brazil is the world's fourth largest market for mobile phones [3].

Despite this, there is a paucity of research into the experiences of mobile digital technology media by this cohort, both in that country and elsewhere. The study presented here replicated a larger programme of research being undertaken principally in the UK. Brazilian adults with Learning Disabilities were interviewed to explore their experiences in using such media, particularly smartphones, in their everyday lives to verify whether and

how this use enhances or facilitates independence, self-expression and self-advocacy. Possible difficulties were also explored during the interviews with the intent to elicit whether there are barriers to fully exploit the technology. The latter aspect of the research is important in helping to show how this cohort can avoid being disenfranchised by the march of technology in everyday life. In a future stage, the aim is to co-produce an accessible, annotated and hyperlinked living electronic archive of their 'digital lives'. The ubiquitous nature of digital mobile technology will mean that an exploration of its use will provide a rich picture of 21st century life as a person with LD.

II. SMARTPHONE USAGE IN BRAZIL

In 2018, Brazil, with about 210 million inhabitants and 220 million active smartphones has more than one smartphone per inhabitant, and Smartphone penetration in the country is already above the global average of 115%. [4]. Of people who do not have smartphones, more than half are made up of children, adolescents and the elderly, people who generally do not have purchasing power or technological knowledge (the latter cohort in particular) or interest in smartphones, showing that penetration of use among consumers is even more ubiquitous than the numbers show [5]. When considering age data, the group between 25 and 34 years old is the one that concentrates the users of telephony devices, and the percentage of penetration among these users reaches 88.6% [6].

There is also evidence of changes in social interactions caused by the use of smartphones. For example, Guimarães [6] reports that in a Motorola survey conducted in four countries (Brazil, France, USA and India), 49% of Brazilian users aged 16 to 20 years said that they consider the smartphone their 'best friend'. In addition, the study also reveals that 56% of Brazilians 'panic' when they think they have lost their smartphone. Among the countries that participated in the study, Brazil spends the most time on the mobile phone: 68% of Brazilian respondents answered that they are 'constantly' using the device.

Statistics suggest that one of the most popular uses of smartphones in Brazil is to consume media, either music or video. In Brazil it is common for users to keep external flash memory with their content and select files containing their music, film or other media choices. For texting as well as for streaming, WhatsApp, Facebook, Twitter are extremely popular as the SMS service plans are fairly expensive in Brazil. Some mobile applications that are highly successful are GPS navigation applications such as Waze, taxi hailing applications such as 99Taxi, and urban bike rentals. Other popular categories of applications are banking, video games, photography, TV and radio access, dating services, weather updates or video and audio conferences [7]. Internet access is also one of the main uses of smartphones. The IBGE survey above [5] revealed that of the 116 million Brazilians connected to the internet during the year 2016, most (94.6%) preferred smartphones to navigate.

III. PRIOR RESEARCH INTO MOBILE TECHNOLOGY USE BY LEARNING-DISABLED PEOPLE

As with other aspects of the topic of digital technology and people with learning disabilities, research is fragmented and wide-ranging, with no extensive body of work built up examining any particular aspect of the subject.

This is because of differences in:

- participant cohort (and definitions thereof);
- device type (mobile phone, 'smart' phone, tablet computer etc.);
- area of interest (day to day use, training to facilitate a particular activity, particular apps etc.);
- methodology (usability tests, interviews, ethnographic approaches etc.);
- the changing of technology over time.

'Early' studies include that by Bryen, Carey and Friedman [8], who surveyed people with intellectual disabilities (ID) on the extent and scope of 'cell phone' usage. Results suggested that the cohort use the technology far less than mainstream adults, being 'primarily for emergencies, storing numbers, and day-to-day communication' (p1). Chief reasons for non-use were 'expense, lack of perceived need and difficulty in use' (p6). In another early study, Dawe [9] sought to 'understand ... patterns of remote communication among young adults with cognitive disabilities and their parental caregivers' (p179). The study found that

people with cognitive disabilities made 'many' of the calls, usually to solve minor problems such as those with transport. Difficulties included confusing menus and using small physical keypads.

More recently Kumin et al [10] explored the usability of touch-screen displays and virtual keyboards with adults with Down Syndrome. Participants performed a series of tasks on an iPad. These were 'tasks that are typically important for computer usage in the workplace ... social networking, email, calendaring/scheduling, price comparison, and basic text entry/note-taking'. Results showed that 'all participants were able to complete

the majority of the tasks in all five categories [although] ... performance varied dramatically' (p.136). 'Some' participants had problems with the touch-screen (as it was very sensitive) and often accidentally tapped and therefore activated unwanted apps in the middle of a task. Participants also had problems with icons, because they were 'small .. often unrecognizable ... and often cryptic' (p137). Problems with passwords were also noted.

Rocha, Bessa and Cabral [11] assessed the efficacy of a mini iPad device used by people with intellectual disabilities. Participants were required to carry out five tasks such as adding colour to a line drawing and three manipulating 'pieces' of a puzzle. Difficulties were noted in both 'touch' and in dragging virtual pieces. Other papers on the subject include those on mobile technologies to assist people with learning disabilities in the work place[12]; using an app to aid travel autonomy [13], and learning generally with iPads and/or mobile apps [14], [15].

IV.METHODS

This was a qualitative research study that used a mixture of group and individual interviews and participatory observation of device usage to collect data. The study was conducted at a Day Centre for People with Learning Disabilities, "The Association of Parents and Friends of Exceptional People of Belo Horizonte" (APAE-BH¹), in the capital of the state of Minas Gerais, Brazil. This is a non-profit social organization which promotes overall development and improvement of the quality of life of people with intellectual and multiple disabilities among other goals. APAE-BH directly and freely provides services in the areas of social assistance, health and education. Many attendees participate in training workshops to prepare people for the competitive labour market.

A. Participant profiles

Participants were sought for the project who have what is classed as 'mild' learning disabilities and who, as such, are 'functionally literate'. This has been defined as reading that is used for basic survival, such as being able to read street signs and simple sentences [16: p.164]. Eleven adults who attended APAE-BH activities as students, two of whom were also residents, participated in the study. Ages ranged from 17 to 40, as follows:

TABLE I
PARTICIPANT AGE RANGES

Age range	No. participants
17-19	3
20-29	5
30-39	2
40-49	1
Total	11

As can be seen in Table 1, most (8/11) participants were below 30. They were at the mild end of a learning Disability spectrum, and with two exceptions, were able to articulate their views.

B. Data Collection

The interviews were undertaken in Portuguese, the native language of the participants. Both authors carried out the interviews. The first author took the lead, whilst the second took notes, asked follow-up questions and helped where there were language problems (as the first author was not a native speaker).

The interviews explored themes such as the experiences, benefits and difficulties of using both the hardware and software, and how the technology could be improved. Participant responses enabled the researchers to assess whether and how use of these technologies enhanced the personal identity, independence and self-advocacy of the participants, and elicit the barriers.

The fieldwork formed part of a wider project for which ethical permission had been approved by the University College London Ethics Committee. Information sheets were translated from English to Portuguese and distributed. Information was also given orally to both participants and supporters. The latter were also given a detailed 'participant profile', which guided them in terms of appropriate recruitment. Potential participants agreeing to take part signed an accessible consent form.

Interviews were conducted at the familiar APAE facilities used by the participants. To begin the sessions, participants were once again told about the project and what their role would be. This was undertaken in a group (the largest group had five participants, the smallest two) with those who were already familiar with others in the cohort, at the institution where the research took place. The data gathering then began in such groups. Chatting to participants with their peers (or peer in one case) was preferred over doing so individually, at first. This was because, as Daems *et al* [17:p76] points out, group interviews ‘have the advantages of a group dynamic that can help build confidence, safe environments that are not threatening or intimidating; and peer support and validation, all enabling people with learning difficulties to contribute to research discussions’.

For this study, all of the participants were in possession of a mobile device (although for the overall research programme, the impact of not having one was of interest too). The sessions began with the question ‘what do you think of mobile phones?’ The idea was to prompt a general discussion on the benefits, experiences and difficulties of using both the hardware and software. The discussions included light probing on topics such as agency (i.e. who had control) and support, the impact on social interaction and other topics relevant to the study.

After the group sessions, participants were interviewed individually. By this stage individuals had become familiar with the researchers and had already made various observations. Those who were initially quiet during the group sessions were gradually coaxed into the discussion. Although it was agreed that no-one should be forced into contributing and could, of course, opt out of the following individual interview, all participants chose to complete this part of the data gathering too.

- Individual interviews were undertaken in order to:
- explore in more depth views expressed in the group sessions;
- elicit more information in a situation where the participants had a greater opportunity to express themselves;
- demonstrate usage – the latter offering opportunities for usability considerations.

To make it as comfortable as possible for the interviewees, individual sessions started with the researchers asking for repetition or enlargement of information already proffered in the groups. New information was sought next – although not always forthcoming. The usage demonstration occurred here, so participants could both describe and show usage. Of interest here were the ‘apps’, the keyboard, the browser among others and to say what they found difficult or were not able to do with their phones. Even where these were available and online, there were occasions where participants either could not remember how they performed a particular action – accessed music, for example – or were not correct in their assertions. An example of the latter was someone who reported posting on Facebook whereas in fact, she was actually doing it on Messenger, engaging in one-to-one chat.

C. Data Analysis

For qualitative data analysis categories were created that describe the content of the interviews. The material was coded and comments were categorised and classified through grouping comments according to their content. The main categories were mobile phone usage; the role of mobile technology; levels and types of support, and the various barriers encountered.

D. Limitations

The study was limited in that, as participants were not usually permitted to use their mobile devices within the institution, many did not have them to hand during the interviews. In hindsight, it may be that the need for participants to be able to demonstrate their device usage was not made clear enough. Thus, after the first visit, this aspect of the research was emphasised and during the course of the following (three sessions, out of the four) three participants duly came with their mobiles and were ready to use them as required – although they were not able to connect to the Internet.

V. FINDINGS

This section considers first mobile device usage, in terms of communication, social media and not-communicative aspects (e.g. the camera facility); the role of mobile technology in facilitating independence, inclusion and self—advocacy; levels and types of support, and the various barriers encountered.

A. Mobile device usage

Considering first, then, how the technology is exploited by the cohort, on the surface there appears to be much use of mobile devices. Respondents reported not only owning mobile phones, but in some cases tablets and/or laptops and home PCs too. It was not entirely clear whether all of these devices were the sole possession of the participants – other family members were often mentioned in this regard, and in one instance the participant had been denied the use of a home computer or tablet.

Interestingly, for some of the participants, the actual ‘telephone’ use (i.e. to make one-to-one voice calls) was restricted to ‘important’ or ‘emergency’ reasons. Participants explained that this was because of the fear of using the device in the street where it would be vulnerable to theft, and accruing excessive charges (both of which are discussed in more detail in the section on barriers, below). Supporters complained of expensive tariffs, and it appears that participants may have had the need to not be extravagant impressed upon them. Although the group were generally very articulate, it may be that another reason was a lack of confidence in being able to self-express in a disembodied single-channel medium.

Much use was reported of the messaging app WhatsApp (known colloquially in Brazil as ‘Zapp’). Although not mentioned as such, use of this service may also have depressed traditional voice calls (which are possible on WhatsApp, but apparently not undertaken). Eight of the 11 participants reported using it, for both one-to-one and group messaging. This echoes a trend in Brazil, where the service has reached almost saturation point, with ‘nearly 100% of internet users in Brazil . . . , more than any other messaging app or service [at] January 2016’ [18] and 53% of the entire population ‘by the fourth [sic] quarter of 2016’ [19].

With respect to social media, Facebook was mentioned extensively, but only the very able appear to use it actively – posting comments and engaging with friends. Others tended to be more passive users, only looking at the posts of others – a finding reflecting exactly those from the UK. One admitted (again, reflecting UK findings) that she was worried about her spelling and so declined to add content, and another was waiting for a relative to set-up an account for her. Facebook Messenger service was mentioned, but only by one participant (WhatsApp seems to dominate as a ‘chat platform’). The Messenger user, in fact, appeared to think that the service was all that Facebook consisted of, until a supporter showed the full Facebook page.

Prior literature has also found that people with Learning Disabilities are less-frequent users of Facebook than the general public. Shpigelman and Gill, [20] for instance, in a self-report ‘accessible’ online survey, found use tended to be only ‘at least once a week’ as compared to ‘at least once a day’ for the general population of Facebook users [21]. A supporter being interviewed for the longer UK study in the UK opined that people with learning disabilities may not feel the need to constantly update their status or broadcast their activities, as some other people do.

Participants were asked about their use of laptops and other information technology, for contextual purposes. All used their phones or (in one case) a tablet to access social media - in keeping with a survey cited by Chen and Li, (2017), which found that 76% of all time spent on social media was via a mobile.

When not being used for communication purposes, mobile phone use was dominated by YouTube, both for watching programmes and music videos; listening to music from other sources, and using the camera facility. Perhaps surprisingly, only two people mentioned playing games on their smartphones.

Regarding music, while three participants said they listened to YouTube videos via Wi-Fi, two mentioned downloading music from YouTube and one of the care assistants said that ‘they all’ knew how to do this. As these participants did not have their devices to hand it was not possible to confirm whether the activity was, indeed, ‘downloading’ or simply streaming. It should be pointed out that an official YouTube app, YouTube Go, was released in 2017, that allows downloading videos legally. This is to serve regions such as India, where internet connections are unstable or slow and streaming is a problem.

In the UK study, where many (23 to date) had their mobiles with them and connected to wi-fi, there seemed to be much doubt about how music was actually downloaded (i.e. from the Internet) or uploaded (i.e. from a CD) to participants’ phones. Some simply opened Spotify and appeared to listen only to that service’s pre-selected playlists. Others accessed a favourite singer on YouTube and, again, did not choose their own songs. Actually downloading, rather than streaming, was extremely rare (2 cases to date).

B. Independence

The use generally of the communication facilities afforded by modern ‘smartphones’ was considered by the participants and supporters alike – especially the latter – to be a tremendous benefit in terms of inclusion and independence. One participant had a Brazilian friend living in Germany, contact with whom would have been far more difficult (and far less ‘synchronous’ without modern technology). A small group also enjoyed being members of a WhatsApp ‘chat group’ and so were able to keep a steady stream of messages circulating when they were geographically separated.

There was also mention of the benefits of being able to carry a phone around whilst travelling and, thus, be able to call when in trouble. Clearly, this facilitates a level of independence not possible in the past. There was much acknowledgement of the risks, however, in terms of petty theft, a topic discussed in the section on ‘Barriers’.

Also in terms of facilitating independence, one participant reported using a map application (WAZE) to look at traffic conditions and another to look for directions. However, ‘the world’s largest community-based traffic and navigation app.’ [22] ‘should ... ONLY [original emphasis] be used while traveling in a motor vehicle that moves with the flow of traffic ... Using Waze on ... other methods of transportation [bus, foot] causes false data to be submitted to the system and causes other problems’ [23] The service was only mentioned in terms of being a pedestrian – so it is perhaps not surprising that one of its users commented that it often led him to the wrong place. However, a recent study by McMahan *et al* [24] found that, even after training, Google Map users (in controlled conditions) were only able to navigate correctly (i.e. follow the correct route at a given point) 50% of the time. Navigational aids, therefore, may need a high degree of pre-training.

Another aspect of ‘independence’ is that of the independence to actually have and use the devices themselves. Contrary to the UK study, where there was much monitoring and prohibitions of phone use (and in particular, accessing social media) imposed by parents and other relatives, there was little mention of restrictions. This ‘laissez faire’ attitude could possibly be explained by differences between Brazilian and European culture and parental styles. Cultural and ethnic differences vary the optimal parenting style. Opinions manifested in the Expat.com-Brazil Forum, in discussions on the Topic ‘Raising Kids in Brazil’, indicate the perception by foreigners that the indulgent parenting style predominates among Brazilians upper classes. Nevertheless, the large territory, the high social inequality, and the strong presence of immigrants, makes it difficult to assert that there are any predominant parenting styles in Brazil [25].

C. Self-expression and self-advocacy

Despite mobile technology facilitating independence, there was little evidence or demonstration of such devices facilitating self-expression and, therefore, self-advocacy. This may not be surprising – even in their literature review of the use of social media by the cohort, Caton and Chapman [26] did not note these concepts as being manifest.

One way in which mobile phones (and indeed, information technology generally) aided self-expression was the ‘speech to text’ facility, which obviates the need to use a keyboard or be able to spell correctly (or approximately correctly!) and speeds up the communication process. However, only one participant reported using this feature. In the concurrent UK study, there was some doubt about the efficacy of this, with those who had tried it complaining that it wrote ‘wrong words’, or that ‘it doesn’t work’. The latter remark was from a gentleman who repeated the assertion, without elaboration, when gently probed on what the difficulty was. In fact, there is support from the literature to suggest that this type of software is only ‘moderately successful’ [27: p139].

Another aid to self-expression is the facility to record and send messages. However, only one participant in the Brazilian study said she uses this feature in her WhatsApp exchanges. Here there is no media conversion – the audio is recorded as a message and sent in the same way as text would be – obviating the problems both of negotiating the written word and the unreliability of the speech to text software. Even in the larger UK study, use of this feature was very rare – and only mentioned rarely even by supporters. It appears that, despite a microphone icon visible (albeit this disappears when the text entry box where it is shown is tapped) there was little knowledge of this communication aid.

D. Levels and types of support

Mobile technology appears to help very much in supporting people with learning disabilities. In a very touching way (though spoken in a very matter-of-fact manner) supporters expressed their satisfaction that they

were able to take messages or answer the phone ‘at any time’, such as when those in their care were distressed or worried. This was considered a huge advantage (and could be interpreted as a form of self-advocacy in that the devices created greater opportunity for participants to self-express). Supporters reported that the greater and improved capability of communication allowed by mobile technology has had an impact in the ability for people to express themselves, and to do so in a timely manner (i.e. having the care worker conveniently to hand on the end of a telephone, rather than not being around for a considerable amount of time).

Participants were appreciative of this help – both with regard to their well-being and the help they received in their learning and use of technology. In fact, during the fieldwork interviews carers variously showed how to access music, post on Facebook and take photos. The fact that help was needed in these areas showed that, despite a good awareness of the functionality of the phone, there was much uncertainty about how to actually use the various applications possible. Many had attended a formal IT course at the centre, although this was based mainly around the use of PCs, and included topics such as the use of Microsoft Office – geared principally to enhancing employment prospects - rather than mobile apps.

E. Barriers

Barriers of several types were elicited, from both interviews with participants and supporters, and from the minimal amount of usability work undertaken. These ranged from contextual factors such as the fear of assault, mentioned earlier; to usability problems such as coping with a small touch-screen keyboard and posting Facebook updates; to more personal issues such as not wishing to mis-spell a word. Difficulties with the various apps used were mentioned such as not knowing how to download software or to use Google Maps or problems with using the camera. Breakages and mal-functions were also reported.

Regarding the problem of assault, six of the participants and even the supporters mentioned this as the problem when using with a mobile outdoors, rather than the possibility of simply losing a phone. Mobile technology in Brazil tends to be relatively more expensive than in Europe or the United States, and – quite apart from the expense, of course – there is also the emotional or even physical effect on the victim. Because of this fear of crime, participants said they were reluctant to use their mobiles when they were out, and only did so when necessary, with one describing how he made calls surreptitiously, and others indicating various ways of secreting their devices on their person. The risk of assault can be illustrated by the more than 16,000 cell phones that were stolen in the Federal District of Brasília in one four-month period in 2018 [28]). For people with deficiencies, this is even more dramatic as they are especially easy targets for theft [29]. Unfortunately, even though there are apps developed to help the disabled in their daily routine (for example to help the visually impaired to use public transportation) [2], in practice this group of people cannot take advantage of them outdoors.

It is worth making the point for readers not familiar with Brazil, that the UK Government’s Foreign Office states that ‘Crime levels are high’ in the country, and that ‘Violence and crime can occur anywhere and often involve firearms or other weapons’. The Foreign Office also advises tourists to ‘be vigilant when using public transport, especially during rush-hour as petty crime is common’ and to ‘be aware of people approaching to ask for information, especially at night’. [30].

Another prominent barrier was the cost, and cost management of various telecommunications packages. An apparently constant problem was reported by the supporters of companies contacting subscribers with offers to increase data limits, ‘talk-time’ or number of package-included texts for increased monthly fees. As many people with learning disabilities do not understand the value of money, they are likely to accept these offers without considering the financial implications. This can be regarded as a form of acquiescence bias – the tendency to agree with a person of perceived or actual authority or power [31]. On the other hand, as mentioned above, for some participants, there seemed to be an awareness of cost, to the extent that there was an element of self-rationing with voice calls, to prevent large monthly phone bills.

Usability problems were few, but this may be because, although many participants described their mobile usage – including their difficulties - only two participants were able to actually show how they manipulated them. One reported finding texting (and in particular WhatsApp), frustrating because of the auto-complete function, which often completed the wrong word. This is an interesting point, as another problem – mentioned by participants and supporters – was that of being able to spell correctly. It may be that the reason the auto-complete function was not helpful was that required word were not begun correctly.

There was general, if not universal, agreement that keyboards on mobile devices – even mobile phones – were not difficult to use, despite the smaller size. However, there were dissenters. The physicality of a ‘notebook’ keyboard was favoured over the mobile touch-screen by one participant, and another mentioned the general difficulty of using a small touch-screen with one’s thumbs. In a more formal usability study carried out in the UK as part of the wider research programme (Williams and Shekhar, submitted), people who preferred to use their thumbs to type or otherwise interact with their mobile devices, found both scrolling and ‘pinching’ (using two digits to zoom) difficult.

One potential usability problem was that of the storage and retrieval of photos. Only two people appeared to have a solution of the gradual accumulation of photos on the device itself. In one case, the participant’s father set up a Dropbox account, so all her photos are automatically synched to that ‘cloud storage’ service. Another backed up his photos on Facebook, and then deleted them from his phone. A third said he deleted photos he no longer wanted – but of course, if the balance of retained and discarded photos changed in favour of the former, sooner or later the memory would be full.

With regard to breakages and malfunctions, one interviewee complained that her sound box and cable were broken, and there seemed to be a disinclination on the part of her parents to repair/replace them. This type of situation was very prevalent in the full study, based in the UK. With regard to breakages, for example, one person said her phone camera did not work, and other did not use his phone as the charger was broken, and a third had her phone removed from her possession as it was “broken”. There were also other examples of various mal-functions that participants said would not be repaired or corrected, denying them access to the technology.

VI. CONCLUSION

People with LD still face ‘societal-wide exclusion and discrimination’ [32: p22], and are used to having others speak on their behalf. The current research, by involving the cohort as informants, contributed to facilitate their digital inclusion and empowerment – both in eliciting, recording and disseminating their ‘digital lives’, and in undertaking inclusive, participatory research [33], [34]. In Brazil, in the area of information science, very little work has been conducted on people with learning disabilities in general and none was found that focused on their interaction with technologies. The research reported here discussed usage of mobile devices, their role in facilitating independence, inclusion and self—advocacy; levels and types of support, and the various barriers encountered.

Much use tended to be passive, with participants watching YouTube and listening to music. Game playing did not seem to feature to any great extent, with only two of the 11 participants mentioning this. Even the use of social media, as with the UK study, tended to be as consumers rather than producers. Nevertheless, communication apps such as WhatsApp were exploited, and benefits in terms of self-expression/advocacy reported. Barriers included fear of assault and robbery, worries about call charges and other costs, and usability problems. The first two, of course, mitigate against fruitful exploitation of the technology, but problems with the technology itself could be solved by better education around its use – for example, simply by demonstrating and encouraging speech to text or the facility to record and send audio messages.

Finally, more work needs to be done to further explore the impact of mobile technology on the lives of this cohort – and in particular, perhaps, the dynamic of social media use. Nevertheless, the research reported here has provided valuable insights about the ‘digital lives’ of a still-neglected group of people.

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