

SUNspot – Ease of Use and Wireless Device Modifications by Adults with Disabilities

Volume 2014, Number 03 – July 2014

We created “SUNspot” to share some of the latest findings from ongoing data collection for our Survey of User Needs (SUN), our cornerstone survey on use and usability of wireless technology by people with disabilities. We launched the first version of the SUN in 2001. The current version (Version 4) was launched in September 2012. Data collection was conducted through September 2013. The data reported here are preliminary results. Over 1300 people completed the SUN questionnaire, approximately 1150 of whom reported having one or more of the following difficulties:

- *Difficulty concentrating, remembering or making decisions*
 - *Frequent worry, nervousness, or anxiety*
 - *Difficulty seeing*
 - *Difficulty hearing*
 - *Difficulty speaking so people can understand you*
 - *Difficulty using your arms*
 - *Difficulty using your hands and fingers*
 - *Difficulty walking or climbing stairs*
-

Introduction

This SUNspot focuses on any changes and modifications that people with disabilities might make to their mobile wireless devices to make them easier to use. Even though relatively high rates of people with disabilities use cellphone and tablets, they often face challenges accessing those devices. In response they may make changes, additions, or modifications to their devices.

Data Analysis

Table 1 shows that the SUN sample of people with disabilities own or use wireless devices like cellphones, smartphones and tablets at rates similar to the general population as measured by the Pew Research Center. This probably reflects, in part, advances in technological and financial accessibility of mobile devices in recent years. Devices have become more powerful,

flexible and affordable because of manufacturer and carrier commitment, market competition and federal regulatory requirements.

Table 1 – Wireless Use and Device Type (All respondents with a disability)

Do you own or use a cellphone, smartphone or tablet?	SUN	Pew
Cellphone or smartphone	84%	90%
Cellphone, smartphone or tablet	91%	--
If you own or use a cell phone or tablet, what kind do you use? (Check all that apply)		
Basic cellphone (e.g., Motorola Razr, Pantech Breeze, Nokia 6350)	31%	32%
Smartphone (e.g., iPhone, Android phone, BlackBerry, Windows phone)	54%	58%
Tablet (e.g., iPad, Kindle Fire, Galaxy Tab, Google Nexus)	31%	42%
Other (iPod Touch, Nook, Kindle, netbook, laptop)	6%	--

Sources: Wireless RERC, Survey of User Needs, 2012-2013. Pew Internet Surveys, 2006-2013, <http://www.pewinternet.org/data-trend/mobile/cell-phone-and-smartphone-ownership-demographics/>

Overall, high percentages of adult respondents with disabilities reported that their devices were generally easy to use. When asked how easy their primary wireless device is to use, almost 4 in 5 (79%) said that it was easy or very easy to use. Still, a substantial percentage of respondents with disabilities (21%) said their device was at least somewhat hard to use (Table 2).

Table 2 – How easy is your PRIMARY WIRELESS DEVICE to use?

	Adults respondents with disabilities
Very easy to use	35%
Easy to use	44%
Somewhat hard to use	16%
Hard to use	3%
Can't use it without help	2%

Further, a majority (57%) of respondents reported having made changes or additions to make their primary wireless devices easier to use (Table 3). The most common changes or additions have been physical accessories like protective skins, headsets, lanyards, etc., which were added by almost a third (32%) of respondents. Protective skins and lanyards help people to pick up and hold their devices. They make the device less slippery and larger, making them easier to stay in user hands. Headsets are particularly useful for people with limited upper extremity use.

Assistive or accessible software like text-to-speech and screen reading software were the second most frequent addition or change (17% of respondents). Small percentages of adult respondents with disabilities also added assistive devices (7%) and improvised solutions (4%).

Table 3 – Have you CHANGED OR ADDED anything to your primary wireless device to make it easier to use? (% of AAC users) Check all that apply.

	Adults respondents with disabilities
No changes or additions	43%
Physical accessories – protective skin, headset, lanyard, stylus, etc.	32%
Software – text-to-speech software, screen reader, app downloads	17%
Assistive devices – headswitch, EMG switch, AAC device, neck loop, etc.	7%
Improvised solutions – handstrap, Velcro, wheelchair mount, etc.	4%
Other	8%

Overall, there is some consistency across disabilities in the use of modifications and additions to their devices. However, some patterns stand out. Those who reported difficulty thinking were least likely to make changes or additions to their devices (51%). Respondents with difficulty seeing and those with physical limitations (walking and using arms and hands) were more likely to add physical accessories.

Table 4 – Have you CHANGED OR ADDED anything to your primary wireless device to make it easier to use? (% of AAC users) Check all that apply.

	DIFFICULTIES					
	Thinking	Seeing	Hearing	Speaking	walking, standing	Using arms, hands
No changes or additions	51%	41%	45%	42%	47%	43%
Physical accessories: protective skin, headset, lanyard, stylus, etc	36%	38%	30%	34%	37%	41%
Software: text-to-speech software, screen reader, app downloads, etc	18%	26%	18%	26%	17%	17%
Assistive devices: head switch, EMG switch, AAC device, neck loop, etc	5%	6%	14%	11%	5%	6%
Improvised solutions: hand strap, velcro, wheelchair mount, etc	2%	5%	2%	6%	8%	10%
Other	7%	10%	12%	11%	6%	8%

Additionally, respondents with difficulty seeing or speaking were more likely to add assistive or accessibility software. Common software additions for users with visual impairments include: screen readers, magnifiers, and text-to-speech and speech-to-text software. Some users with speech limitations might add speech generating or text-to-speech software.

Conclusion

The results presented here indicate that, usability and accessibility challenges persist for people with disabilities. The gap in mobile wireless use between people with disabilities and the general population persists, even if it may have narrowed somewhat in recent years. But, overall ownership and use of wireless technology is only one indicator of the size of the “digital divide.” Among those who own wireless devices, and who may even say their devices are easy to use, a substantial number have made modifications to make their devices easier to use. The details of how users with disabilities adapt their devices, and how and for which activities they use their devices, provide fuller understanding of the challenges and opportunities for further advances in accessibility and usability.

Data source: Survey of User Needs (SUN), Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC). We share survey data with consumers, researchers, engineers, manufacturers and carriers, and policymakers, for the purpose of improving usability of wireless technology. We invite the public to take the Survey of User Needs and share how wireless technology affects daily life, and how it could be improved. The data presented here are based on a non-random sample. The survey is promoted broadly through convenience sampling techniques, with special effort toward reaching under-represented groups.

Acknowledgement: The Wireless RERC is sponsored by the National Institute on Disability and Rehabilitation Research (NIDRR) of the U.S. Department of Education under grant number H133E110002. The opinions contained in this paper are those of the Wireless RERC and do not necessarily reflect those of the U.S. Department of Education or NIDRR.