

SUNspot – People Who Use Augmentative and Alternative Communication Devices and Their Use of Mainstream Wireless Devices

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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 have 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*
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Introduction

This SUNspot focuses on adults who use Augmentative and Alternative Communication devices (AugComm or AAC, for short) and their use of cellphones, smartphones and tablets. The ongoing development of increasingly powerful and accessible cellphones, smartphones and tablets has created new mobile technology options for people with speech limitations and other complex communication needs (CCN). Until the current era of smart devices, people who have difficulty producing intelligible speech typically had to rely on specialized hardware and software to produce electronically generated speech.

Since the launch of the iPhone and iPad and competing smart devices that run on Android and other mobile operating systems, there has been a proliferation of speech generating mobile

apps, along with keen interest in such solutions among people with CCN, their families and friends, and teachers and other professionals working in this area. These trends have created tensions, as mobile apps and the consumer platforms upon which they run often fall short of the capabilities of dedicated AAC devices. Furthermore, professional assessment of communication abilities is often required to choose appropriate speech technology. On the other hand, solutions based on smart mainstream platforms provide much greater opportunity for self-help among consumers and their families and friends, and often cost significantly less than their dedicated AAC counterparts.

Fundamental to these issues is the question of whether people with CCN use mainstream mobile communication technologies, and if so, which technology and platforms do they use? Do they use smartphones and tablets, or regular “feature phones”? If they do favor smart devices, is there a clear preference for tablets or smartphones? Is there a clear preference for a particular operating system? This SUNspot addresses these fundamental questions.

Data Analysis

A total of 38 adults who use AAC completed the Survey of User Needs questionnaire. This relatively low number of respondents reflects, in part, the low incidence of this population (1.3% or 4 million Americans) and the difficulty of reaching out to people with complex communication needs. Still, this number of respondents is enough to identify some trends in cellphone and smart device ownership. Table 1 shows the percentage of AAC users and other respondents with disabilities who do not use AAC technology.

Table 1 – Use of Wireless Devices by Adults Who Use AAC and Other Adults with Disabilities

	Adults who use AAC	Others with disabilities
Do you own or use a wireless device such as a cell phone or tablet? (% yes)	70%	92%
If you own or use a wireless device, what kind do you use? (Check all that apply)		
- Basic phone (e.g., Motorola Razr, Pantech Breeze, Nokia 6350, Owasys)	13%	28%
- Smartphone (e.g., iPhone, Android phone, BlackBerry, Windows phone)	53%	57%
- Tablet (e.g., iPad, Kindle Fire, Galaxy Tab, Nexus 7, BlackBerry PlayBook)	53%	35%

*A small percentage of respondents with disabilities reported owning both a basic phone and a smartphone. Consequently, the total number of respondents with disabilities who own any kind of cell phone is smaller than the sum of the percentage of respondents with disabilities who own either type.

Several results stand out. First, overall adults who use AAC have a much lower tendency to own or use wireless devices such as cellphones and tablets than other adults with disabilities (70% versus 92%). Second, adults who use AAC were much less likely to have basic cellphones, but

approximately as likely to have smartphones, as adults with disabilities who do not use AAC. Third, AAC users were much more likely to use tablets than respondents with disabilities who do not use AAC devices.

Altogether these results suggest that smart devices (smartphones and tablets) are more useful and usable to adults who use AAC than basic cellphones given the former's wide array of features. It is possible that smartphones and tablets are being used as a communication device instead of, or in addition to, their more costly specialized Speech Generating Devices. The limited evidence available from our survey does not provide a clear answer on this point.

Which operating systems are most common on the smartphones and tablets owned by adults who use AAC and non-users of AAC? Table 2 shows that respondents who use AAC who also own smartphones are much more likely to have an Android smartphone than an iPhone (60% versus 35%). It is unclear if the primary cause of this ownership pattern is cost, screen size, or some other factor. Among all other respondents with disabilities who use a smartphone, iPhone ownership is higher than Android ownership (48% versus 41%).

Table 2 – Smartphone Operating Systems

If you own or use a SMARTPHONE, what kind do you have? (Operating system)*	Adults who Use AAC	Other with disabilities
Android powered smartphone (Examples: Motorola Droid, Samsung Galaxy S)	60%	41%
Apple iOS smartphone (Example: Apple iPhone)	35%	48%
BlackBerry smartphone (Example: BlackBerry Bold 9700)	5%	7%
Windows powered smartphone (Examples: Nokia Lumia, HTC Tilt, Samsung Focus)	10%	5%
WebOS powered smartphone (Palm Pre or Pixi)	0%	<1%
Other	5%	4%
Don't know	0%	1%

*Percentages add to greater than 100% since some respondents have more than one device, using different operating systems.

The advantage that competing smartphones enjoy over the iPhone among respondents who use AAC is not evident when looking at tablets. Table 3 shows that equal percentages of AAC respondents own Android-powered tablets and the iPad. Meanwhile, other respondents with disabilities show a marked preference for the iPad over Android-powered tablets (65% versus 31%). Within each group, the percentage of iPad owners was considerably higher than the percentage of iPhone owners.

Table 3 – Tablet Operating Systems

If you own or use a TABLET, what kind do you have? (Operating system)*	Adults who use AAC	Others with disabilities
Android powered tablet (Examples: Samsung Galaxy Tab, Amazon Kindle Fire)	50%	31%
Apple iOS tablet (Example: Apple iPad)	50%	65%
BlackBerry tablet (Example: BlackBerry Playbook)	0%	2%
Windows powered tablet (Examples: Microsoft Surface)	5%	4%
WebOS powered tablet (HP Touchpad)	0%	1%
Other	15%	5%
Don't know	0%	1%

*Percentages total > 100% since some respondents have more than one device, using different operating systems.

Conclusion

The results presented here indicate that respondents who use AAC own mobile consumer devices at substantially lower rates than respondents with other disabilities. Respondents who use AAC reported higher rates of tablet ownership than others with disabilities. Additionally, respondents who use AAC *and* who own a smartphone have a considerably greater likelihood of owning an Android device than an iPhone.

It is not surprising that ownership and use of mainstream information and communications technology is lower among AAC users than others with disabilities. Cellphones (and to a lesser degree smartphones) are still primarily used for spoken communication. Additionally, speech limitations often are accompanied by motor limitations which make accessing mainstream technology even more challenging. Still, the data presented here show that many adults who use AAC also use smart devices at rates comparable to or higher than others with disabilities.

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.

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