

Wireless Technology Use and Disability

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Agenda

1. Overview – Wireless RERC
2. Overview – Survey of User Needs
3. SUN 2012-2013 – Sample
4. Data analysis – All respondents with disability
 - Use of wireless technology
 - Preferences for operating systems
 - Wireless substitution - “cutting the cord”
 - Economic divide
 - Urban-rural wireless connectivity divide
 - Age divide
 - Use patterns by disability

Overview of the Wireless RERC

- **Founded in 2001**
 - by grant from U.S. Dept of Education, National Institute on Disability and Rehabilitation Research (NIDRR)
 - Currently in Year 2 of our third 5-year grant cycle, which began in Oct 2011
- **Partners**
 - Shepherd Center – consumer research, and industry outreach and training
 - Georgia Tech, Center for Advanced Communication Policy (CACP) – policy research
 - Georgia Tech, Interactive Media Technology Center (IMTC) - development

Overview of the Wireless RERC

- Mission – to promote:
 - Equitable access to wireless technology
 - Universal Design in mobile wireless technology
- Structure – projects in 3 categories:
 - Research
 - Development
 - Training & Outreach



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Overview of the Survey of User Needs

Survey of User Needs (SUN)

- Background
 - Launched in 2002
 - Now on its 4th version, which launched in 2012
- Results are shared with industry, developers, designers, regulators, advocates and consumers with disabilities

The image shows a screenshot of a survey form titled "Survey of User Needs for Wireless Technologies 2012-2013". The form is divided into several sections. The top section is a header with the title and a welcome message. Below this is a paragraph explaining the purpose of the survey and the information collected. The next section is "2. What is your gender?" with radio buttons for "Male" and "Female". This is followed by "3. What is your age?" and "4. What is your race/ethnicity?" with checkboxes for various categories. The "5. What is your relationship to you?" section includes a sub-section "1. If someone is helping you complete this survey, what is their relationship to you?" with checkboxes for "No one is helping me. I am completing it for myself.", "Parent", "Spouse or partner", "Other family member", "Friend", "Primary caregiver (paid)", and "Primary caregiver (unpaid)". The bottom section is "Part 1. About you" with radio buttons for income levels: "\$35,000-\$49,999", "\$50,000-\$74,999", and "\$75,000 or more".

Overview of the Survey of User Needs

Purpose

Track how people with all types of disabilities use wireless technology.

Objective

Inform designers, developers, industry, regulators, advocates, people with disabilities.

Mission

Ensure that wireless technology is accessible to people with disabilities

The image shows a screenshot of a survey form titled "Survey of User Needs for Wireless Technologies 2012-2013". The form is divided into several sections. The top section is a header with the title and a subtitle "Welcome! Survey of User Needs for Wireless Technologies". Below this is a paragraph explaining the purpose of the survey: "The purpose of this survey is to learn how people of all ages and abilities use wireless technology. The survey mainly focuses on cellphones, but also includes questions about other types of device like tablet computers such as Apple's iPad, Amazon's Kindle Fire and other similar devices." This is followed by a paragraph stating that the information collected will help designers and engineers make new wireless devices and services that meet user needs, and that the survey has been completed by more than 5000 people since 2001. Another paragraph encourages users to complete all parts of the survey, noting that answers are important and that the survey can be completed with assistance. A confidentiality statement follows, stating that personal information will not be sold or used for other purposes. The "ABOUT US" section identifies the survey as being conducted by the Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC), funded by a 5-year grant from the U.S. Department of Education's National Institute on Disability and Rehabilitation Research (grant number H133E110002). Contact information for John Morris (404-367-1348, john_morris@shepherd.org) and Melanie Clark (404-894-6942, melanie.clark@gtrc.gatech.edu) is provided. The form then asks for the relationship of the helper, with options: "No one is helping me. I am completing it for myself.", "Parent", "Spouse or partner", "Other family member", "Friend", "Primary caregiver (paid)", and "Primary caregiver (unpaid)". The bottom section is titled "Part 1. About you" and includes a question about annual income with radio button options: "\$35,000-\$49,999", "\$50,000-\$74,999", and "\$75,000 or more".

Overview of the Survey of User Needs

Timeline:

SUN 1 – launched in 2002, after RERC founded

SUN 2 – Launched in 2006, after RERC refunded

SUN 3 – Launched in 2010, to keep abreast of mobile technology development

SUN 4 – Launched in 2012, after RERC funded and again to keep up with technology development

Overview of the Survey of User Needs

SUN Timeline	Respondents
SUN 1 – Launched in 2002 after RERC founded	900
SUN 2 – Launched in 2006 after RERC refunded, updated	1200
SUN 3 – Launched in 2010 to keep abreast of mobile technology development	700
SUN 4 – Launched in 2012 after RERC funded to keep up with technology development	650

Overview of the Survey of User Needs

Structure of current SUN

Part 1	About you – Demographics (age, race, gender, etc)
Part 2	About your abilities
Part 3	About your wireless devices
Part 4	About your wireless activities
Part 5	About your wireless service plans

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Survey of User Needs - Sample

Data collection period: 09/04/2012 – 02/24/2013

Number of respondents: 647

Respondents with disabilities (over 18): 539

Gender:

- Female 58%
- Male 42%

Age:

- Range 18-89
- Mean 51
- Median 53



Survey of User Needs - Sample

Home location:

- Urban area 33%
 - Suburban 48%
 - Rural area 19%
-

Employment

- Full time 38%
- Part time 15%
- Retired 20%
- Not employed 27%



Survey of User Needs - Sample

WHAT IS YOUR RACIAL/ETHNIC BACKGROUND?

Asian/Pacific Islander	2.8%
Black/African American	6.5%
Hispanic/Latino	2.0%
Native American	1.5%
White/Caucasian	87.4%
Other	2.6%
TOTAL	102.8%

Survey of User Needs - Sample

DO YOU HAVE ANY OF THE FOLLOWING DIFFICULTIES?	
Difficulty walking or climbing stairs	40%
Difficulty hearing	39%
Difficulty seeing	30%
Difficulty using hands or fingers	27%
Difficulty concentrating, remembering, deciding	21%
Frequent worry, nervousness, or anxiety	20%
Difficulty using arms	18%
Difficulty speaking so people can understand me	13%

Survey of User Needs - Sample

Visual impairment and hearing loss*	
Blind	13%
Low vision	16%
Deaf	11%
Hard of hearing	32%

*Percent of total respondents with disabilities.

Survey of User Needs - Sample

WHAT IS YOUR ANNUAL GROSS HOUSEHOLD INCOME?			
	SUN	ACS	Weight
Less than \$10,000	12.04	12.63	1.049194
\$10,000-\$14,999	7.18	9.51	1.324031
\$15,000-\$24,999	12.23	15.39	1.257694
\$25,000-\$34,999	12.23	11.71	0.957306
\$35,000-\$49,999	14.95	12.87	0.861114
\$50,000-\$74,999	17.09	13.47	0.788535
\$75,000 or more	24.27	24.41	1.005752

Survey of User Needs - Sample

Weighting

- **Necessary** - Our convenience sample does not provide the degree of representativeness of a random sample
- **Technique** – What values multiplied by a probability distribution in SUN sample will give me the corresponding distribution in a reference sample?
 - $\text{weight} \times \text{sample} = \text{reference sample}$
 - $\text{weight} = \text{reference sample} / \text{sample}$
- **Reference Sample** - Steven Ruggles, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. *Integrated Public Use Microdata Series: Version 5.0* [Machine-readable database]. Minneapolis: University of Minnesota, 2010.

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 - Data analysis by disability

Wireless Use – All Respondents with Disability

Wireless Use and Type of Device	SUN	Pew
Do you own or use a wireless device such as a cell phone or tablet? (Yes)	93%	87%*
If you own or use a cell phone or tablet, what kind do you use? (Check all that apply)		
Basic phone (e.g., Motorola Razr, Pantech Breeze, Nokia 6350)	34%	42%
Smartphone (e.g., iPhone, Android phone, BlackBerry, Windows phone)	59%	45%
Tablet (e.g., iPad, Kindle Fire, Galaxy Tab, Google Nexus)	31%	31%
Other (iPod Touch, Nook, Kindle, netbook, laptop)	6%	--

*Cell phone only; <http://pewinternet.org/Commentary/2012/February/Pew-Internet-Mobile.aspx>

Wireless Use – All Respondents with Disability

If you own or use a SMARTPHONE, what kind do you have?
(Check all that apply)

Android-powered smart phone (e.g., Motorola Droid, Samsung Galaxy)	38%
Apple iOS smart phone (e.g., Apple iPhone)	50%
BlackBerry smart phone (e.g., BlackBerry Bold 9700)	8%
Windows-powered smart phone (e.g., Nokia Lumia, HTC Tilt)	5%
WebOS powered smart phone (e.g., Palm Pre and Pixi)	0%
Other	3%
Don't know	1%

Wireless Use – All Respondents with Disability

If you own or use a TABLET, what kind do you have?
(Check all that apply)

Android-powered smart phone (e.g., Samsung Galaxy Tab, Amazon Kindle Fire)	26%
Apple iOS smart phone (e.g., Apple iPad)	71%
BlackBerry smart phone (e.g., BlackBerry Playbook)	2%
Windows-powered smart phone (e.g., Microsoft Surface)	1%
Web OS powered smart phone (e.g., HP Touchpad)	1%
Other	5%
Don't know	1%

Wireless Use – All Respondents with Disability

Is there at least one telephone INSIDE your home that is currently working and is NOT a cell phone? - INCOME

Less than \$10,000	65%
\$10,000-\$14,999	76%
\$15,000-\$24,999	76%
\$25,000-\$34,999	64%
\$35,000-\$49,999	79%
\$50,000-\$74,999	81%
\$75,000 or more	83%

Wireless Use – All Respondents with Disability

Is there at least one telephone INSIDE your home that is currently working and is NOT a cell phone? - AGE

18-30	57%
31-40	61%
41-50	75%
51-60	82%
61-70	86%
Over 70 years old	89%

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - INCOME

	No wireless device	Basic phone	Smartphone	Tablet
Less than \$10,000	2%	36%	45%	23%
\$10,000-\$14,999	5%	49%	41%	14%
\$15,000-\$24,999	10%	30%	43%	18%
\$25,000-\$34,999	0%	40%	48%	27%
\$35,000-\$49,999	4%	43%	52%	23%
\$50,000-\$74,999	6%	31%	55%	34%
\$75,000 or more	0%	18%	73%	45%

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) – URBAN-SUBURBAN-RURAL

	No wireless device	Basic phone	Smartphone	Tablet
Urban area	3%	37%	47%	26%
Suburban area	4%	30%	58%	30%
Rural area	2%	32%	55%	29%

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - AGE

	No wireless device	Basic phone	Smartphone	Tablet
18-30	3%	29%	54%	35%
31-40	2%	20%	69%	31%
41-50	2%	29%	58%	35%
51-60	3%	32%	55%	22%
61-70	2%	41%	49%	26%
Over 70 years old	14%	54%	26%	29%

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - DISABILITY or IMPAIRMENT

	No device	Basic phone	Smartphone	Tablet
Cognitive	4%	31%	53%	23%
Anxiety	4%	35%	47%	26%
Seeing	3%	37%	49%	25%
Hearing	5%	27%	57%	31%
Speaking	6%	28%	49%	43%
Using arms	6%	41%	40%	37%
Using hands and fingers	6%	36%	50%	33%
Walking, climbing stairs	4%	40%	48%	33%

Wireless Use – All Respondents with Disability

If you own or use a cell phone or tablet, what kind do you use? (Check all that apply) - DISABILITY or IMPAIRMENT

	No device	Basic phone	Smartphone	Tablet
Hearing Loss				
- Deaf	3%	21%	66%	45%
- Hard of hearing	5%	31%	54%	27%
Vision Loss				
- Blind	2%	31%	52%	13%
- Low vision	5%	43%	41%	30%

Contact Us

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