

Analyzing User-Generated YouTube Videos to Understand Touchscreen Use by People with Motor Impairments

Lisa Anthony (UMBC)

YooJin Kim (UMD)

Leah Findlater (UMD)

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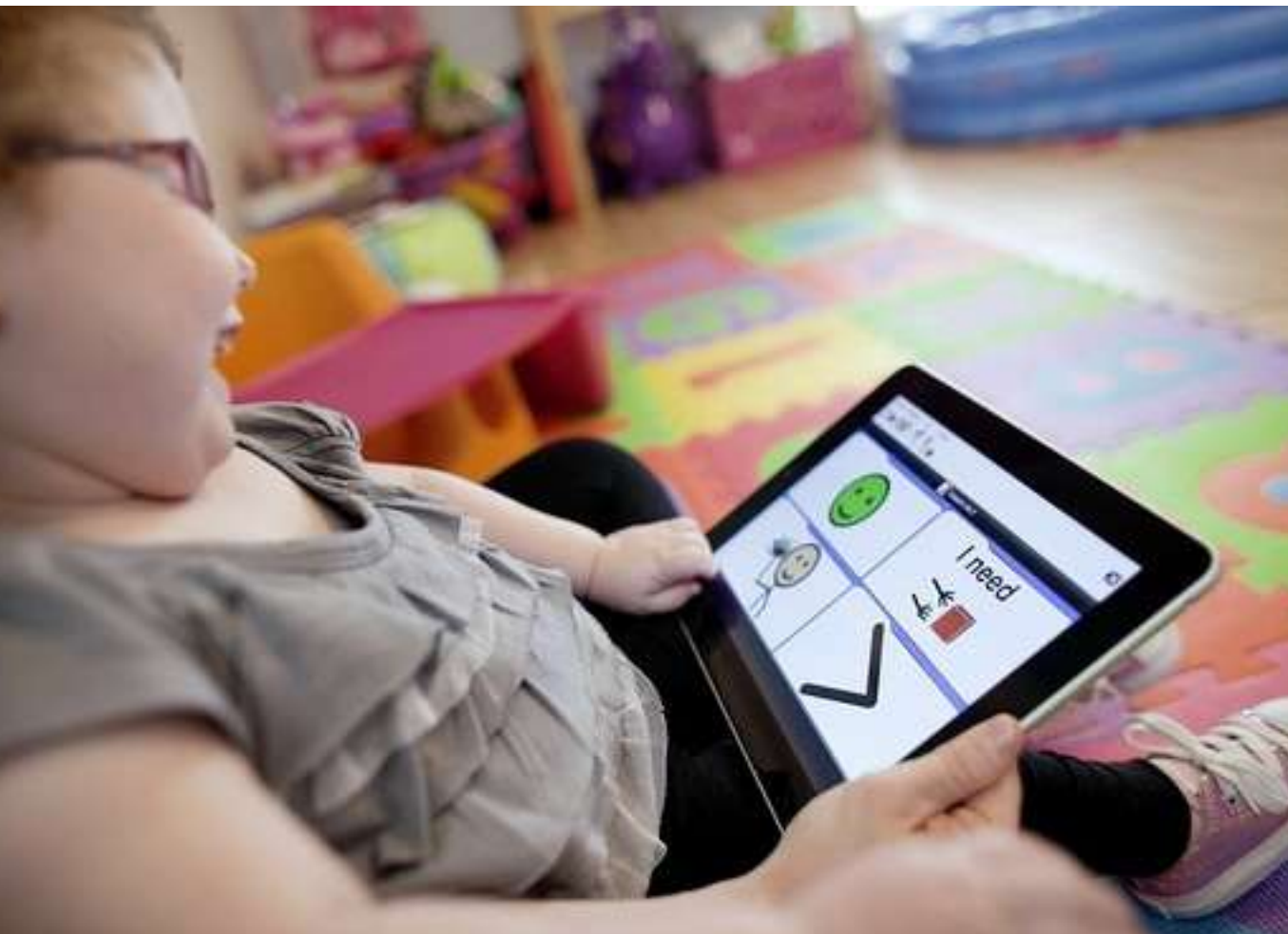


Challenge and Opportunity

- How are people with physical disabilities making use of touchscreen devices?



Varied and Diverse Use Cases



Population Difficult to Access



Users' Own Stories on YouTube



Analyzing YouTube Video Content

- Users with a (visible) physical disability or motor impairment
- Videos showing interaction with a (mainstream commercial) touchscreen device



Research Questions

- What are these touchscreen devices being used for on a daily basis?
- How well do they work out of the box, or how poorly?
- What adaptations are users making to improve accessibility?



Search Strategies

- Medical conditions
- Technology terms



Searching for YouTube Videos: Medical Conditions (60)

- AAC, accessibility, ALS, amputation, amputee, arthritis, assistive technology, ataxia, augmentative communication, brain injury, cerebral palsy, congenital amputation, congenital amputee, disabilities, disability, disease, dystonia, essential tremor, Friedreich ataxia, Friedreich's ataxia, handicap, hemiplegia, hemiplegic, hydrocephalus, hydrocephaly, Lou Gehrig's, Lou Gehrig's Disease, medical amputation, medical amputee, motor disabilities, motor impairment, MS -microsoft, multiple sclerosis, muscular, muscular dystrophy, myopathy, paralysis, paralyzed, paraplegia, paraplegic, Parkinson's, Parkinson's disease, physical disabilities, psychomotor agitation, quadriplegia, quadriplegic, rehabilitation, sclerosis, seizure disorder, SMA, special needs, spina bifida, spinal, spinal cord injury, spinal muscular atrophy, stroke, TBI, traumatic brain injury, tremor, wheelchair



Searching for YouTube Videos: Technology Terms (8)

- touch screen, touchscreen, smartphone, tablet, app, iPad, iPhone, iPod



Searching for Videos on YouTube: Technology Terms (8)

- touch screen, touchscreen, smartphone, tablet, app, iPad, iPhone, iPod
- What we did not include:
 - AAC devices
 - Other specialized hardware



YouTube Video Dataset: Users Represented

- 187 videos
- 101 uploaders
- 43% female
- 47% children ages 1-5 years
- 26% adult ages 18-65 years



YouTube Video Dataset: Conditions Represented

Medical Condition	No. Videos (% of 187)	No. Users (% of 101)
Cerebral Palsy	46 (25%)	22 (22%)
Spinal Muscular Atrophy	31 (17%)	16 (16%)
Quadriplegia / Hemiplegia	14 (7%)	7 (7%)
Seizure disorder	9 (5%)	2 (2%)
Hydrocephaly	6 (3%)	3 (3%)
Spinal Cord Injury	6 (3%)	3 (3%)
Other	62 (33%)	32 (32%)
Unable to determine	39 (21%)	31 (31%)



YouTube Video Dataset: Devices Represented

- iPad (78% of videos)
- iPhone (17%)
- Other (iPod Touch, Android tablets, touchscreen Tablet PCs) (5%)



Coding the Dataset for Themes

- Video characteristics
- Device usage in video
- User characteristics
- Type of interaction



What Did We Find?



What We Found: Use of Fingers and Hands



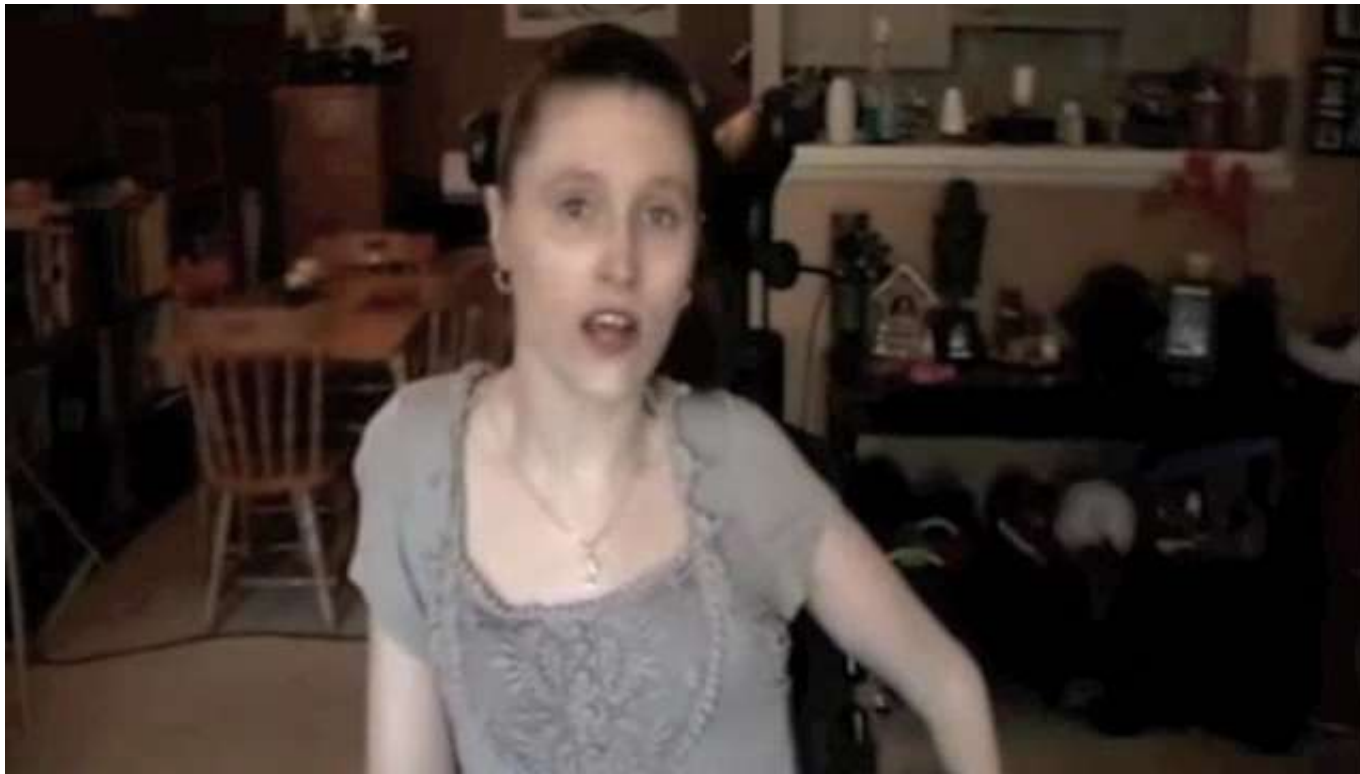
What We Found: User and Device Postures



What We Found: DIY Physical Adaptations



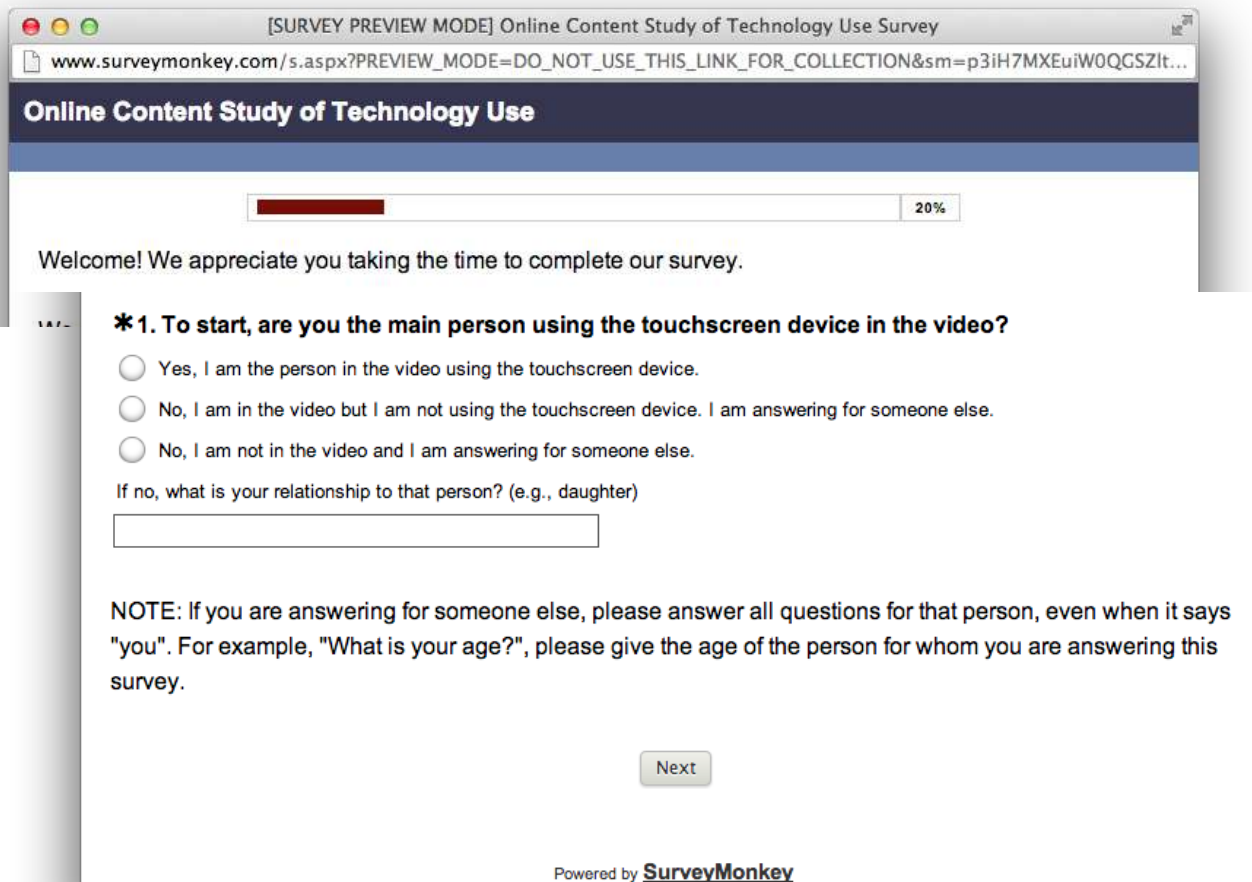
What We Found: Enabling Independence



Special Subset: Children



Follow-Up Survey



[SURVEY PREVIEW MODE] Online Content Study of Technology Use Survey

www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=p3iH7MXEuiW0QGSZlt...

Online Content Study of Technology Use

20%

Welcome! We appreciate you taking the time to complete our survey.

***1. To start, are you the main person using the touchscreen device in the video?**

- Yes, I am the person in the video using the touchscreen device.
- No, I am in the video but I am not using the touchscreen device. I am answering for someone else.
- No, I am not in the video and I am answering for someone else.

If no, what is your relationship to that person? (e.g., daughter)

NOTE: If you are answering for someone else, please answer all questions for that person, even when it says "you". For example, "What is your age?", please give the age of the person for whom you are answering this survey.

Next

Powered by **SurveyMonkey**

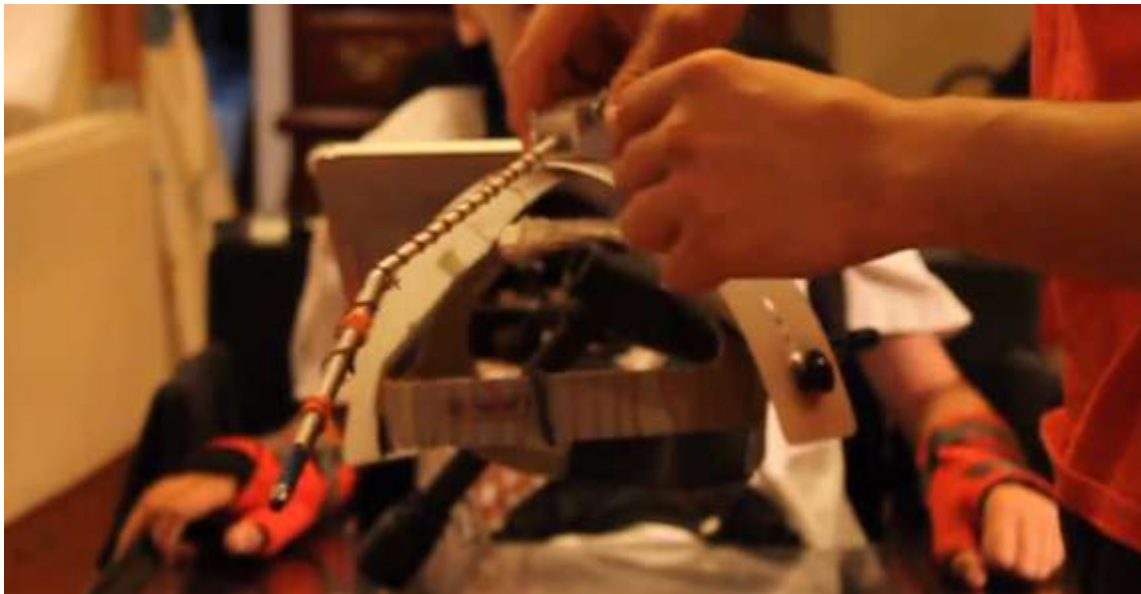


Design Implications



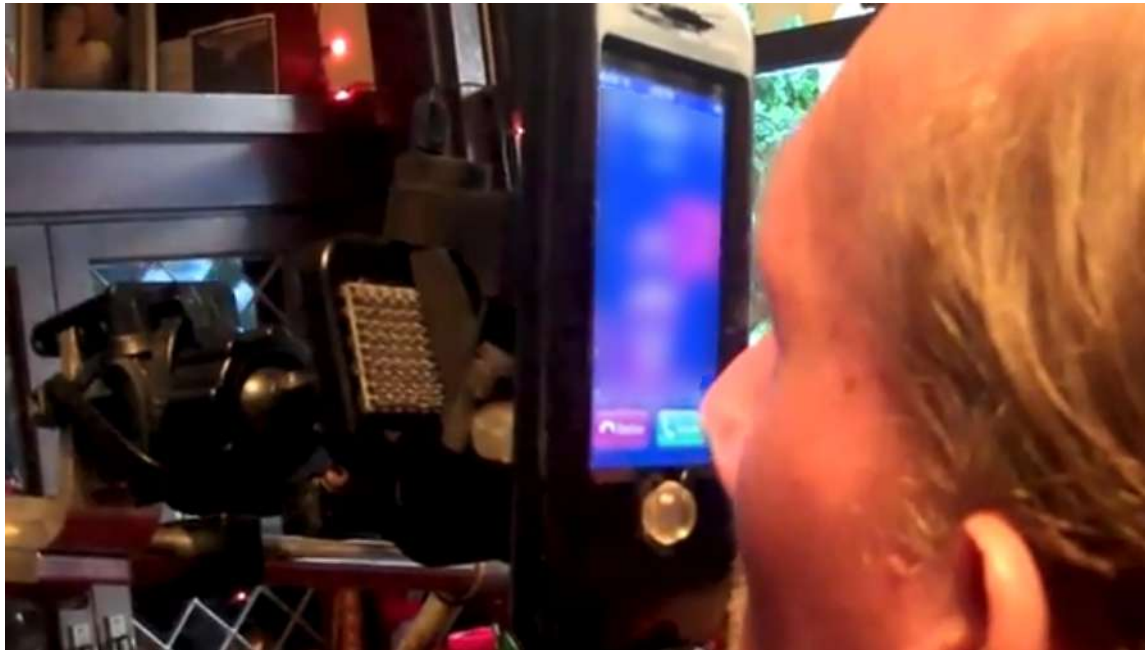
Design Implications

- Adaptations for sensitivity of the device



Design Implications

- Alternative support for multitouch interaction



Design Implications

- Constant touch habituation



Design Implications

- Standardized physical guides or better DIY support



Design Implications

- Apps for children that don't require fine motor control



Contributions

- Use cases, interaction styles, challenges from broad range of users
- Design implications
- Extending use of YouTube videos as data source:
 - Blythe & Cairns, CHI 2009
 - Paay et al., Extended Abstracts CHI 2012



Thanks!

- Lisa Anthony, lanthony@umbc.edu, @drlanthony
- YooJin Kim, ykim0710@umd.edu
- Leah Findlater, leahkf@umd.edu, @leahfindlater

