
Proceedings Paper:
Judge, S., Robertson, Z. and Hawley, M. S. (2010) Why don't professionals provide speech driven environmental controls? perceptions of current speech driven environmental controls. In: Proceedings of SRR. Society of Research in Rehabilitation, 7th and 8th July 2010, Sheffield. The Society for Research in Rehabilitation , Sheffield , pp. 953-959.

https://doi.org/10.1177/0269215511410925

Barnsley Assistive Technology Team

Why don't Professionals Provide Speech Driven Environmental Controls?

Perceptions of current speech driven environmental controls

Simon Judge, Senior Clinical Scientist, Barnsley Assistive Technology Team

Zoë Robertson, Clinical Scientist, Barnsley Assistive Technology Team

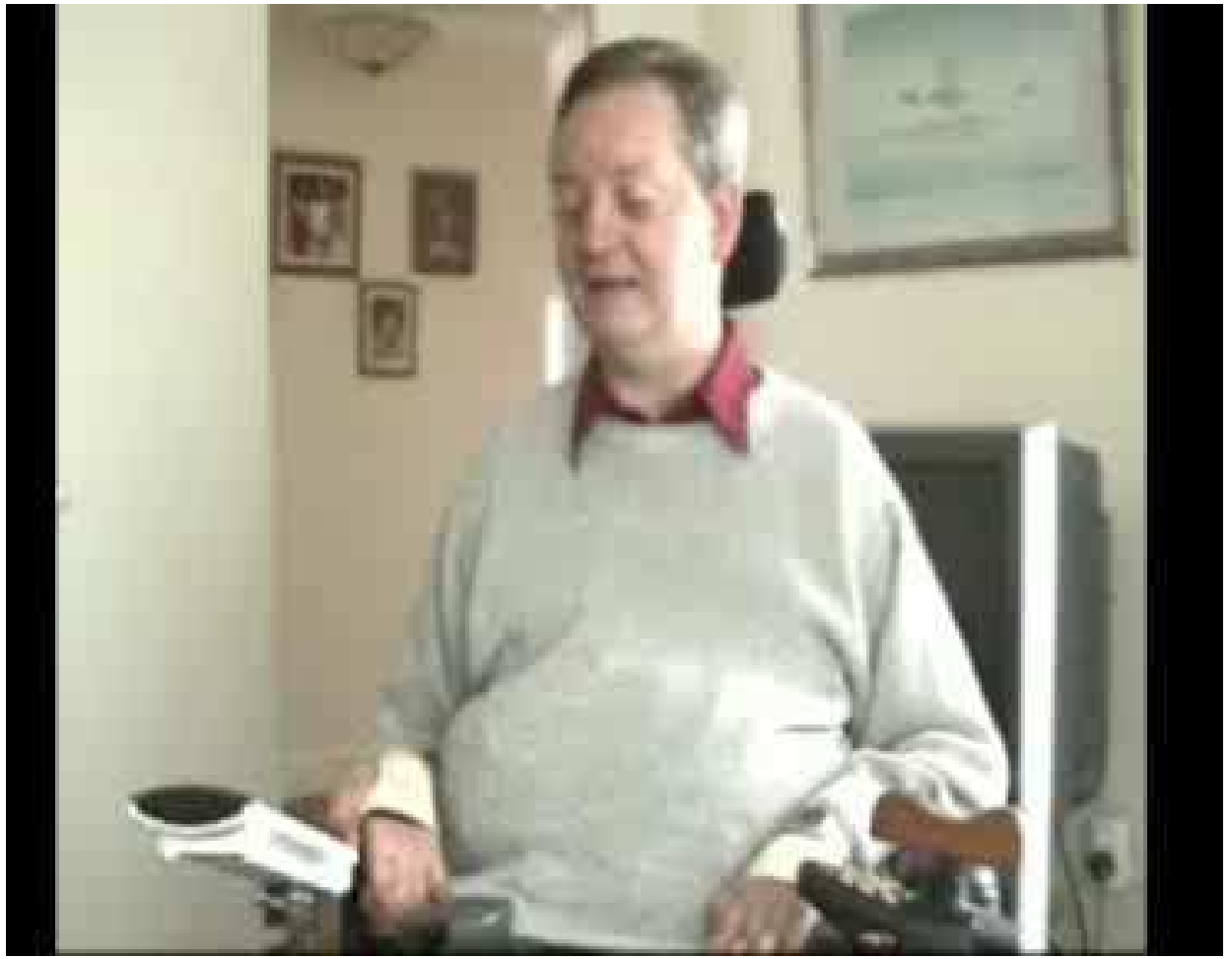
Professor Mark Hawley, Barnsley Hospital and University of Sheffield School of Health and Related Research (ScHARR)

Environmental Controls

- Environmental controls (EC)
  - Used by people with disabilities to control their immediate environment e.g. television, telephone, opening door
  - Common access methods
    - Switch
    - Direct access
  - Some speech-driven systems available but speech not widely adopted for EC access. Why?

"it's made my life a lot easier and simpler, you know, because they'd be nothing worse than every time you wanted to do a channel change or something having to call a carer."

Speech Driven Environmental Controls



SPECS

- SPECS Device:
  - Speech Driven Environmental Control
  - Sensitive to disordered speech
  - Device based on 'on-market' offering from major UK manufacturer

SPECS Project

- Develop new device from specification, through prototyping to testing
- Stage 1 of SPECS project to develop specification based on user feedback about existing speech driven environmental control systems
  - *Project funded by the Health Technology Device Programme of the Department for Health*

SPECS :: User Involvement / User Centred Design

- Developing specification:
  - 12 in-depth qualitative interviews with users of existing devices performed

- Developing new device:
  - 6 potential users involved in an iterative design process

SPECS :: Professional Involvement

- Aim:
  - Collect information from professional's involved in the provision of environmental control systems both positive and negative
  - Couple this with user information to inform the design specification

SPECS Professional Involvement :: Method

- Professional's involved in the provision of environmental control systems invited (n=6)
- Topic guide based on two face to face interviews performed with professional's
- Two sessions
  - Discussion of existing systems
  - 'Blue sky' ideas

SPECS :: Professionals' Data Analysis

- Framework Analysis – a targeted qualitative analysis
- Data coded into framework constructed from end-users' data :: to allow comparison between end users and professionals

SPECS :: Results :: Background

- *Disability/Condition* & *Cognitive Ability* strongly referenced
- Reflected in provision of systems: Spinal Cord Injury often cited, MS cited as contra
- Low provision rate accepted

You've got to match the client's cognitive profile haven't you and obviously it's not always appropriate.

SPECS :: Results ::
Speech Driven Environmental Control Usage

- Use as a last resort - *'used when switch input is not acceptable'*,
- Use as a *'backup device'* - either in conjunction with a switch system or for times when the switch system could not be used
- Risk Assessment key
- Training important and confounded by existing UI
- Service implications in provision

we've got eleven now and it's literally just down to that issue of when there is no other available controllable function

SPECS :: Results :: Interface

- Users need to understand 'how to talk to the device'
- Screening of end-users for characteristics of voice
- Aesthetics appreciated as an important factor

Consistency is certainly key and as I say, I've detected characteristics in two of the devices that make it perform better.

SPECS :: Results :: Factors Influencing Success

- Positive around use of speech devices in some situations
- Positive indicators for success:
  - particular voice patterning
  - modifying control words
- Benefits and simplicity of interaction method considered positive

I think it likes hard pronounced syllables and that's what it performs best on, hence when you command it you emphasise the hard bits on each word.

SPECS :: Results :: Factors Influencing Failure

- (lots!)
- Reliability (recognition accuracy)
- Sound Interference
- Specific requirements of voice
- Cognitive load

the frustrated person who raises his voice to command it, which is a natural instinct, actually ended up being worse and it was a discipline to remain monotonal and calm, which again is a contra-indication for somebody in an emergency situation

Do Professionals Understand the Needs of Users?

- Empathy?
  - Compared analysis against that from users' data
  - Majority of sub-themes considered by professionals
  - Reliability most strongly emerged as the main factor from both groups

Do Professionals Understand the Needs of Users?

- Variances:
  - Professionals strongly considered disability/condition
  - End users strongly considered 'feedback'
  - 'Factors influencing failure' weakly referenced by professionals :: indicates a positive mental model?

Why Professionals do Not Provide Speech Driven Environmental Controls

- Professionals do provide devices!
  - Low rate of provision
  - Reliability key: impacts on success, risk assessment and service implications
  - Professionals' triage potential end users of speech driven devices
  - Mental model of a successful end-user
  - Systems used in fairly well defined situations & conditions

Barnsley Assistive Technology Team

Barnsley Assistive Technology Team

Simon.judge@nhs.net

Barnsely.AT@nhs.net

www.barnsleyrd.nhs.uk