

Finding Access

...where it may be found

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Cerebral Palsy and Access

- “Individuals with cerebral palsy primarily experience difficulty with motor skills, which vary depending on the location of the brain lesion” (Beukelman & Mirenda, 2005, p.236)
- The incidence of dysarthria among persons with cerebral palsy estimated from 31% to 88%. (ibid, p.237)

Cerebral Palsy and Access

- Modern Augmentative and Alternative communication (AAC) technology can help nonspeaking persons to achieve **communication and environmental control.**
- A significant number of individuals with CP find problems with access to AAC technology.

Society's tools define “standards of access”

- Typical standard input systems involving fine-motor dexterity

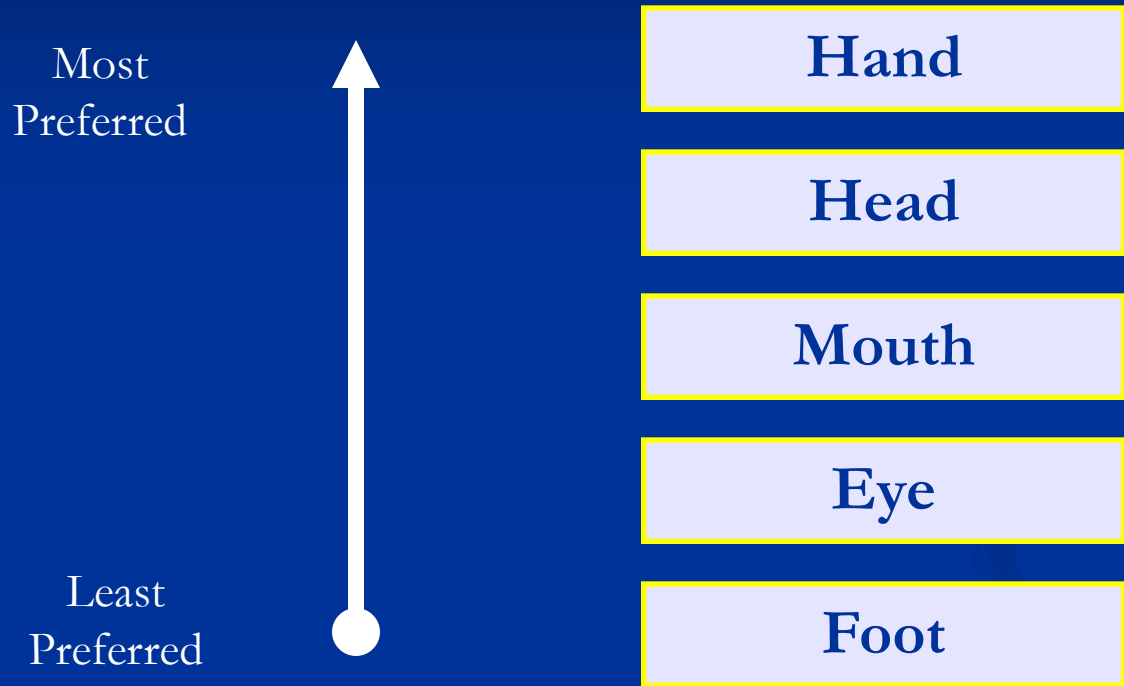
Keyboard

- Mouse
- Key-operated lock
- Door handle
- Steering wheel
- Foot pedal

Game controllers

A Promising Linkage
for Collaborative research

Hierarchy of Control Site Preference



Hierarchy of Control Sites

- Hand
 - Multi-finger keyboarding
 - Single-finger pointing and activating keys
 - Splint-mounted pointer
- Head movement with
 - Head-mounted pointer/stick
 - Head-mounted light sensor
 - Switch/es mounted on head rest
 - Camera aimed at face or reflector

Hierarchy of Control Sites

■ Mouth

- Orofacial gestures
- Lip reading
- Mouthstick

■ Eyes

- Eye gazing monitored by camera
- Eye gazing monitored by visual evoked response
- Blinking to control single switch
- Winking to activate single switch

■ Foot

- Pedal switch
- Foot-operated 2-dimensional pointer (joystick)

Pattern Recognition

- Pattern Recognition of
 - Eye-blink patterns
 - Speech (Speech Recognition)
 - Individual Words and Phrases (Word Recognition)
 - Vocalizations (Vowel Recognition)
 - Facial Gestures

The SCATIR Switch

- Self-Calibrating Auditory-Tone InfraRed Switch – Developed at MSU Artificial Language Lab, Digital SCATIR switch manufactured and marketed by Tash, Inc.
- An IR light beam is reflected off a surface (face, eye, eyelid, toe, etc).
- Detects purposive movement by monitoring the derivative of the intensity of the reflected IR light.
- Useful for capturing purposive contraction of small muscle groups.

Optical Detented Joystick

- For hand or foot control
- Filters out spasticity and tremor by providing local mechanical stability at individual points within a two-dimensional field of stations.
- Present status: in use.
- In development: digital version, using force-feedback design.

Towards a Michigan Access Initiative

- Promote Michigan collaboration in research on Access
- Regular conferences on Access Techniques
- Identify current centers of excellence within Michigan's universities, hospitals, rehab centers, and school districts
- Identify critical problem areas for study

References

Beukelman, David, and Pat Mirenda. Augmentative and Alternative Communication. 3rd ed. Baltimore: Paul H. Brookes, 2005.

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