

Explorer Mini: Young Children's First Driving Experience

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Movement Drives Development

Lobo et al., 2013

Movement Drives Development

Held & Hein, 1963

What is the Gold Standard?

- Self-directed mobility as a fundamental human right (Feldner, Logan, & Galloway, 2016)
 - United Nations
- Whatever is standard for children without disabilities
- Independence
 - Activities of daily living
 - Play
 - Trouble-making

On-Time Powered Mobility

Systematic Reviews (Bray et al., 2014; Livingstone, 2010; Livingstone & Field, 2014)

- Young children can learn to drive
- Mobility skills
- Overall development
- Participation with peers and family
- Play and social skills
- Greater interest in motor activities
- Decreased caregiver assistance
- Improved sleeping and eating
- Latest RESNA Position Paper integrates and supports evidence of systematic reviews (Rosen et al., 2017)

On-Time Powered Mobility

Devices (Feldner, Logan, & Galloway, 2016)

- Motorized wheelchairs
- GoBot
- Cooper Car
- Mobile robots (UD1, Weebot)
- Whizzybug
- Modified ride-on cars

On-Time Powered Mobility

Explorer Mini

- 12-36 months
- Functionality, safety, and battery life of a motorized wheelchair
- Toy-like design
- Lightweight
- Joystick control with 360 degree turning
- Proportional speed control with multiple speed options
- Can be used in seated or standing
- FDA 510k Cleared Device

Purpose

- To describe (1) the driving experience and (2) the emotional responses of young children who experience mobility limitations during initial use of the Explorer Mini.

Method

- Descriptive cross-sectional study utilized a mixed- method approach to describe the initial responses of children, caregivers and therapists to the Explorer Mini.
- Part of a larger Human Factors Validation study that examined the user errors of caregivers and clinicians in operating the Explorer Mini.

Method

Participants

- N = 33 (17 females) who experience mobility-related disability
- Age
 - Mean = 20 months
 - SD = 7.9 months
 - Range = 6-35* months
- Engaged in up to two, 15-minute driving sessions

*initial study included infants as young as six months old although the Explorer Mini has subsequently been approved for use of 12-36 month olds.

Method & Results

Observation Form

- Driving Experiences
 - Does the child visually notice the joystick or seek to explore with other sensory systems (eyes, mouth)?
 - 94%
 - Does the child reach for the joystick when prompted?
 - 88%
 - Does the child reach for the joystick without prompting?
 - 79%

Method & Results

Observation Form

- Driving Experiences
 - Does the child move the device in any direction? Response options included “yes, forward”, “yes, right”, “yes, left”, “yes, backwards”, “yes, in circles”, and “no”
 - At least one direction 94%
 - Forward 82%
 - Backward 61%
 - In circles 61%
 - Right 61%
 - Left 48%
 - Does the child recognize that the device is in motion (i.e. start, demonstrate cause and effect, grasp and release)?
 - 88%

Method & Results

Observation Form

- Emotional Response
 - Does the child exhibit any emotional response?
 - 94%
 - Does the child demonstrate a vocal or verbal response?
 - 64%

Discussion

- A small, toy-like early mobility device with sit-to-stand seating and a midline joystick was instrumental in promoting exploratory behaviors, emotional expression and self-initiated movement in very young children who experience mobility-related disability
- Advantage of Explorer Mini compared to other devices...
- Future research...

References

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