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Preliminary Assessment of HABIT for Children with Unilateral Cerebral Palsy Using Fidelity Measures

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Background

- Interventions for children with neuromotor disorders focus on gross and fine motor skills, bimanual movement, and manipulation exercises[3, 6, 7, 10, 11]
- Hand Arm Bimanual Intensive Therapy (HABIT) is characterized by:
  - structured practice increasing in complexity
  - functional activities that necessitate bimanual use
  - child-friendly protocol considering children's goals and parental involvement[3, 7, 8]
- Fidelity in clinical settings establishes a protocol to plan, implement, and test program efficacy and control outcome associations[1, 2, 6, 10, 11, 12]

Purpose/Hypothesis: The purpose of this study was to assess participants' behaviors during a HABIT camp through behavioral coding. It was hypothesized HABIT programming provided sufficient motor training for hand contact, object manipulation, participant engagement, and challenge tasks.

Methods

HABIT

- Programming was administered at the 2022 UNMC camp spanning a two-week period, four hours daily for a total of 40 hours
- Five children, (Mean age=8.8 years, SD=1.6 years), with unilateral cerebral palsy classified at Gross Motor Function Classification System (GMFCS) levels I-II and Manual Ability Classification System (MACS) levels I-III participated in the study; all participants were left hand dominant
- Video footage collected to measure the following behaviors: right/left contact, right/left manipulation, social engagement, focused attention, and challenge tasks (i.e., therapist provides activities that either do (complex) or do not (simple) cognitively challenge participant)

Fidelity

- Visit footage for analysis includes three random videos per participant, averaging approximately 30 minutes per video, totaling approximately 7 hours
- Fidelity Coding Protocol (multiple coders; *interrater reliability=85.4%±8.6*) used to establish if participant behaviors were congruent with the intervention's principles
- Datavyu software utilized to code all behaviors; descriptive analysis was performed in Excel and outcome variables for each participant were summed as durations and normalized as percentages

Fidelity measures are a necessity to proper clinical analysis of HABIT intervention for unilateral CP cases.

Figure1. Average of percentage of the duration of participant contacts and object manipulation during HABIT sessions. Standard deviation bars represent the data variability.

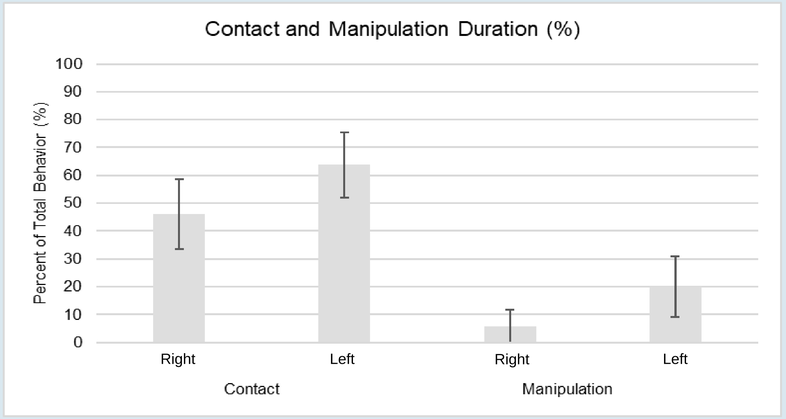
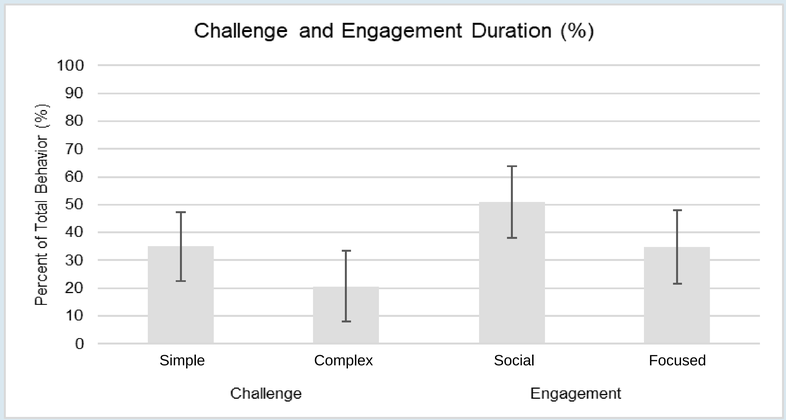


Figure2. Average of percentage of the duration of participant challenge tasks and engagement during HABIT sessions. Standard deviation bars represent the data variability.



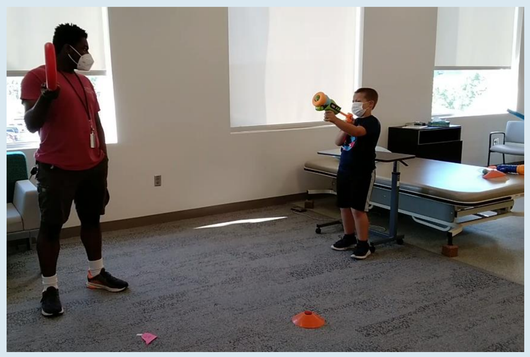


Figure3. Participant demonstrated use of both hands to manipulate a ball launcher through a target. This was classified as a complex task that involved social engagement with an interventionist.

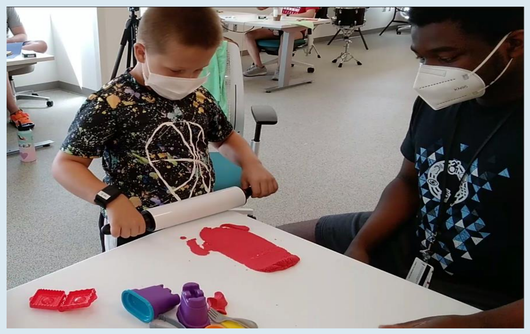


Figure4. Participant demonstrated use of both hands to manipulate play dough with a rolling pin. This was classified as a simple task which required the participant's focused attention.

Results

- Contact duration was relatively equal between left and right hand
- Manipulation duration varied greatly between left and right hand
- Challenging activities were completed throughout nearly half of recorded sessions, and simple tasks were completed more often than complex tasks
- Participant engagement occurred throughout most of the recorded sessions: social engagement comprised roughly half of all engagement alongside participant's focused behaviors

Conclusions

- Both hands performed a similar duration of contact
- Manipulations differed significantly between hands, favoring the unaffected left hand; differences may be due to MACS classification systems and the use of their affected hand primarily for support
- Simple tasks were performed more often than complex tasks, but programming failed to consistently meet complex challenge task duration goals
- HABIT consistently promoted high levels of engaged behaviors and social interaction
- Camp settings of HABIT intervention may be critical to external participant adjustments and comfort in social situations

Future Directions

- Increasing complex tasks may introduce more opportunities for manipulation exercises in both primary and secondary hands
- Analysis of bimanual contact and manipulation may reveal more information as to what activities are best suited for a HABIT program in a camp setting

Additional Information

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Contact Dr. James Gehringer for more information regarding HABIT and current related studies: james.gehringer@unmc.edu