Use of a Modified Changeover Delay Procedure to Decrease Scrolled Responses by a Child With Autism

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Introduction
- The term scrolling has been used by Sundberg (2008) to describe the behavior of a child emitting multiple incorrect verbal responses to a single stimulus. Sundberg noted that incorrect responses emitted are not random, but are usually previously targeted words. For example, consider that an instructor had been teaching a child to give a correct verbal label for a picture of a hat when asked "What is it?". When the task is presented and the child responds with the previously taught verbal labels of "shoes" and "pants" before responding with the correct verbal label of "hat," the child has engaged in scrolling behavior.
- The term scrolling can also be applied to situations where a child emits a series of incorrect motor imitation responses (as opposed to verbal imitation responses) in reference to a single stimulus.
- Scrolling must be minimized while teaching imitation skills to ensure that only correct imitation responses are reinforced.
- One procedure that may be useful in decreasing scrolled responses is the changeover delay (COD). COD procedures have been used in the experimental analysis of behavior to temporarily separate behaviors that are contingent on separate schedules of reinforcement (Herrnstein, 1961; Galina, 1963).
- The purpose of the current study was to use an adaptation of the changeover delay procedure to reduce the rate of scrolling through three learned imitation responses by a child with autism in an attempt to increase correct imitations.

Method

Participants
- Kara was a 2.5-year-old girl diagnosed with autism.
- She received approximately 4 hours of behavioral therapy a week at a university based autism program.

Setting & Materials
- The study was conducted at a therapy room in a university based autism program. All rooms included a table with one chair. Materials included data sheets, a timer, a video camera, card stock paper, index cards which trials to be completed, and a plastic storage bin which held the cards.

Procedure
- Initiation of Wave and Clap
  - An assessment was conducted to evaluate existing imitation skills. Kara showed no ability to imitate motor actions presented by the instructors.
  - A multiple baseline across behaviors single subject experimental design was used to teach clap imitations, wave imitations, and the discrimination between the two.
  - The motor initiation of clap was taught initially with the use of the modified COD procedure in combination with physical prompting that was faded over time. Once clap reached the modified COD-4" procedure in combination with physical prompting that was faded over time.
  - The discrimination between clap and wave was taught using the modified COD-4" procedure.
  - Discrimination sessions consisted of randomly presenting either wave or clap trials.

Results
- Figures 1 displays the percentage of total trials with scrolled clap, wave, and discrimination responses across sessions. Average percentage of clap trials with scrolled responses was 55% across baseline sessions, 11% across the last 5 sessions of the initial implementation of the modified COD-4" procedure, 44% across sessions when wave was taught, and 9% across the last 10 discrimination sessions. Percentage of wave trials with scrolled responses was 97% across the last 10 baseline sessions, 54% across the 4 trials of implementation of the modified COD-4" procedure before winter break, and 9% across the last 10 discrimination sessions. Percentage of trials in which Kara scrolled responses when asked to discriminate between the two imitative responses was 85% across the last 10 baseline sessions and 10% across the last 10 modified COD-4" discrimination sessions.
- Figure 2 displays the results of the total correct clap, wave, and discrimination trials across sessions. Average percentage of clap trials imitated correctly was 0% across baseline sessions, 90% across the last 5 sessions of initial implementation of the modified COD-4" procedure, 52% across sessions when wave was taught, and 90% across the last 10 discrimination sessions. Percentage of wave trials imitated correctly was 3% across the last 10 baseline sessions, 50% across the 4 trials of implementation of the modified COD-4" procedure before winter break, and 91% across the last 10 discrimination sessions.
- Percentage of trials in which Kara correctly discriminated between the two imitative responses was 12% across the last 10 baseline sessions and 90% across the last 10 modified COD-4" discrimination sessions.
- Figure 3 displays the mean of scrolled responses for each trial both before and after trials for each discrimination session. The mean of scrolled responses for the last 10 discrimination sessions was 1% before trials and 1% after trials.
- Figure 4 displays the percentage of total correct tap surface imitation trials across sessions. Kara performed the response correctly 90% of the time across the last 10 baseline sessions, and 90% across the last 10 modified COD-4" discrimination sessions.

Discussion
- One procedure that may be useful in decreasing scrolled responses is the changeover delay (COD). COD procedures have been used in the experimental analysis of behavior to temporarily separate behaviors that are contingent on separate schedules of reinforcement (Herrnstein, 1961; Catania, 1963).
- The purpose of the current study was to use an adaptation of the changeover delay procedure to reduce the rate of scrolling through three learned imitation responses by a child with autism in an attempt to increase correct imitations.
- The modified COD procedure consisted of the instructors verbally presenting the instruction (“Do this”) and modeling the action that Kara should imitate (either clap or wave). If Kara scrolled the representation of the instruction and imitative action was delayed by 4 seconds (COD-4”). The instruction and imitative action were always re-presented 4 seconds after the last scrolled behavior had ended. Reinforcement was given only for non-scrolled correct responses.
- Baseline probes were conducted at the beginning of each session (until the discrimination phase was initiated) which assessed the ability of Kara to complete the other behaviors identified in the multiple baseline.

We would like to thank the therapists at the Campus Autism Program, the parents and child that participated, and the Office of Research and Sponsored Programs.