Learning by observing others: Curriculum considerations for children with autism

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Thank you!

- Rob Holdsambeck and Cambridge Center for Behavioral Studies!
- Staff and students at Alpine
- Jaime DeQuinzio
Why Observational Learning?
Implications ...
What is Observational Learning?
At the foundation of observational learning is imitation

- Imitation: behavior that duplicates some properties of the behavior of a model

(Catania, 2007)
But not all imitation is advantageous!

"I sometimes wish he wouldn't learn through imitation."
Difference between imitation and observational learning

Observational learning requires understanding of contingencies
Observational Learning

- The acquisition of novel operants as a result of observing contingencies related to the action of others. (Catania, 1998)
- Observer does not necessarily have to contact the contingencies
Behavior Analysis of Observational Learning

Behavior Analysis of Observational Learning

- Observer attends to a complex stimulus that includes a modeled response and the subsequent consequence.
- The modeled response and consequence serves as a complex discriminative stimulus for the demonstration of that response by the observer later in time.
- Imitation of a modeled action is influenced by the history of reinforcement, generalized imitation and stimulus generalization.

Masia and Chase (1997)
Teacher asks the model, “What is two plus two?”

The model responds correctly, “four”

The teacher praises the model for answering correctly

The Teacher, three days later asks the observer to add two plus two

Complex discriminative stimulus for imitation at a later time
The observer says, "four"

This response is influenced by stimulus generalization, history of reinforcement for imitation, generalized imitation...

The teacher praises the observer for responding correctly
Teacher asks the model, “What is two plus two?”
The model responds Incorrectly Says, “five”
The teacher says, “no that’s not right, it’s four”
The Teacher, three days later asks the observer to add two plus two
This response is influenced by stimulus generalization, history of reinforcement for responding to the teacher’s instruction or for saying something different...

The observer says, “four”

The teacher praises the observer for responding correctly
Minimally observational learning requires
Motivation?
What about for a child with autism?

- Deficits in attending (e.g., Donnelly, Luyben & Zan, 2009)
- Deficits in imitation (e.g., Williams, Whiten & Singh (2004) Systematic review)
- Deficits in making complex discriminations (e.g., Green 2001)
Observational Learning Research

- Castro & Rehfeldt (2016)
  - Peer vs. Staff models
- Charlop, Shreibman, Tryon (1983)*
  - Receptive labeling task
- Clawson et al., (2014)
  - Video modeling
- Davies Lackey (2005)*
  - Reading dolch words
- DeQuinzio & Taylor (2015) *
  - Discrimination of contingencies
- Egel, Richman & Koegel (1981)*
  - Shape, color, preposition discrimination
- Griffen, Wolery, & Schuster (1992)
  - Preparing recipes
- Leaf et al. (2012) *
  - Shift in preference for toys
- Ledfort & Wolery (2013)
  - Academic and social response
- MacDonald & Ahearn (2015)*
  - Assessment and teaching
- Pereira-Delgado and Greer (2009)*
  - Peer monitoring / discrimination
- Rehfeldt, Latimore & Stromer (2003)*
  - Stimulus class formation
- Taylor, DeQuinzio & Stine (2012)*
  - Reading with a monitoring response
- Werts, Caldwell, Wolery (1996)
  - Long response chains

* Participants with autism
Research?

- Observational Learning as an independent variable
- Observational learning as a dependent variable
Bridget A. Taylor, 2012
This student acquired the words in baseline

Notice how well this child with autism attends to the model, the teacher and the stimuli
This student did not acquire the words

Notice this child does not attend to the model
Imitation and Attending as core variables
INCREASING OBSERVATIONAL LEARNING OF CHILDREN WITH AUTISM: A PRELIMINARY ANALYSIS
BRIDGET A. TAYLOR, JAIME A. DEQUINZIO, AND JAIME STINE
ALPINE LEARNING GROUP

We evaluated the effects of monitoring responses on the acquisition of sight words with 3 children with autism. In the training condition, we taught participants a visual imitation and matching response related to a peer’s reading response. In another condition, participants were exposed only to a peer’s reading response. Participants read the words more accurately during the sessions when the monitoring response was required. Results and discussion highlight the importance of identifying component responses of observational learning and the need for additional research in this area.

Keywords: observational learning, autism, monitoring response

Observational learning has been defined as learning that results from observing the responding of others and the consequences of such responding (Caranta, 2007). Research has demonstrated that children with autism do not readily learn by observing others (Varricchio, Lovass, Koegel, & Everett, 1979), and they show deficits in skills that may be associated with observational learning, such as attending (Karz, Watson, 2011) and imitating (Williams, Whiten, & Singh, 2004). Despite these deficits, only a few studies have attempted to assess or teach children with autism to learn through observation (e.g. Charlop, Schreibman, & Tyron, 1983; Rehfeldt, Lachmore, & Stroomer, 2003; Waris, Caldwell, & Wolery, 1996), and only one has focused directly on training observational learning repertoires (Pereira Delgado & Greer, 2009).

Engaging in monitoring responses, such as attending to and imitating the behavior of the model, and engaging in responses that indicate attention to relevant instructional stimuli could potentially facilitate observational learning (Taylor & DeQuinzio, 2012). To date, research has not successfully isolated or assessed the effects of monitoring responses on observational learning.

In this preliminary investigation, we sought to determine if teaching three children with autism to monitor their peers’ reading responses would lead to the acquisition of sight words. Monitoring consisted of imitating the peer’s response and attending to the instructional materials as demonstrated by a matching response. In one condition, the participant observed a peer reading words presented by a teacher while the teacher prompted the monitoring responses. In another condition, we assessed the acquisition of a different set of sight words when participants were exposed to the instructional interaction between the teacher and the peer but the teacher did not prompt monitoring responses.

METHOD
Participants and Setting
Three children with autism participated: Jack, 4 years 3 months; Eric, 4 years 8 months; and Rebecca, 3 years 8 months. Their age-equivalent scores on the Peabody Picture Vocabulary Test were <1.9 years, 2 years, and <1.9 years, respectively. Participants could follow two-step instructions, match words, imitate vocal responses, and label pictures of nouns, and they all had experience with token economies. Two children with autism, aged 4 and 7 years, served as peer models and could read words with clear articulation. All sessions took place in a classroom and were implement-
What we did

- Multi-element design
- Compared acquisition of sight words in two conditions
- In one condition student is exposed to model reading words and being reinforced for reading the words
- In other condition a monitoring response was taught
  - Imitation following the model
  - Matching chip to word card being read
- We tested their acquisition of the words during test sessions ten minutes after OL sessions

*Teacher never states the word in praise statement*
Participants acquired the sight words in fewer sessions in the condition where the monitoring responses were required.

For two of the participants, responding in the exposure condition improved over time, potentially indicating generalization.

For one participant, responding did not increase in the exposure condition until monitoring was prompted in that condition.
Results
Percentage of Words Read Correctly During Test Sessions
Jack
Results

Percentage of Words Read Correctly During Test Sessions

Eric

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Training Set</th>
<th>Exposure Set</th>
</tr>
</thead>
<tbody>
<tr>
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Three-week maintenance
Results

Percentage of Words Read Correctly During Test Sessions

Rebecca
What about the discrimination of contingencies?

- How do you teach children with autism to understand differential feedback to the model?
  - Pereira-Delgado and Greer (2009)
    - first to document acquisition of discrimination of contingencies
Preliminary assessment

- Will participants imitate modeled responses if a differential consequence is provided: teacher feedback
  - Praise / reinforcement
  - Punishment
Participants’ responses to praise versus correction / punishment was variable but they more often imitated responses even if they were punished.

- Sought to extend Pereira-Delgado and Greer (2009)
  - discrimination the contingencies
    - imitating the responses of the model that were reinforced,
    - saying, “I don’t know” when presented with labels that were incorrectly labeled by the model and consequence to the model’s response was “punishment” (“No, that’s wrong”)
Discrimination of reinforced from nonreinforced responses

- Multiple baseline across participants
- Two Sets of unknown labels to the observer
- Two conditions
  - Exposure of instruction between teacher and adult model
  - Exposure of instruction with opportunity to imitate the adult and prompts for saying, “I don’t know” when the model was incorrect and feedback was “punishing”
- Teacher presented trial to adult and delivered one of two consequences
  - Reinforcement: “Yes!, that’s right” and access to iPad
  - “Punishment”: “No that’s wrong” and no “iPad”
Discrimination training of consequences
<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Model’s Response</th>
<th>Consequence</th>
<th>Correct Response for Participant</th>
<th>Error Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known to Participant</td>
<td>Correct</td>
<td>Reinforcement</td>
<td>Says what’s known</td>
<td>You know it.</td>
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<td>She got it right.</td>
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<td>Say what you know.</td>
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<td>Incorrect</td>
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<td>Punishment</td>
<td>Says what’s known</td>
<td>You know it.</td>
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<td>Does not imitate model</td>
<td>She got it wrong.</td>
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<td>Say what you know.</td>
</tr>
<tr>
<td>Unknown to</td>
<td>Correct</td>
<td>Reinforcement</td>
<td>Imitates model</td>
<td>You don’t know it.</td>
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<tr>
<td>Participant</td>
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<td>She got it right.</td>
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<td>Say what she said.</td>
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<tr>
<td>Incorrect</td>
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<td>Punishment</td>
<td>Says “I don’t know”</td>
<td>You don’t know it.</td>
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<td>She got it wrong.</td>
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<td>Say, “I don’t know”</td>
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Clinical applications and curriculum considerations

- Attending/observing
- Imitation
- Discrimination of contingencies
Attending / Observing behavior

- Makes eye contact with adults (reinforcer is functional)
- Visually tracks adult’s actions (tacts actions as occurring)
- Looks at peers when instructed
- Visually tracks peer’s actions (tacts actions as occurring)
- Increase duration of looking for longer and longer periods of time (with and without distractor stimuli)
- Tacts instructional stimuli observed during and after lesson
Attending / Observing behavior

- Observes multiple actions at the same time
  - Tacts actions after viewing
  - Tacts actions after increased interval of time
Imitation

- Imitation of motor movements (gross, fine, facial)
- Imitation with objects
- Imitation of vocalizations / words / sentences
- Imitation of vocalizations / words / sentences with movements
- Imitation of a completed action
- Imitation of a sequence
- Block imitation
- etc.
Expanding Imitation Training

- Generalized motor, object, and vocal imitation
  - Adult
  - Peer
- Imitation of a group
- Imitation of actions that lead to a desired outcome
  - Operation of toys
  - Access to tangible
- Retention of modeled actions
  - Increased delays in time
Begin peer imitation early
Imitation of a group

- Child brought to room
- Peers engaged in activity
- Does child look around and figure out what to do based on what everyone else is doing
- Does he imitate what others are doing
- Make actions more complex over trials
Imitation of actions that lead to a desired outcome

- Child is given toy he/she cannot operate
- Child observes peer operating the toy
- Child is given toy to see if she imitates actions modeled by peer
Deferred imitation

- Child observes action
- Delay imposed between observation and opportunity to imitate
- Build in the time between observation and opportunity
- Eventually add distractor activities
Discriminating Consequences

- Tacts consequences
  - Praise
  - Punishment
  - No reinforcement
Identifies action being reinforced and chooses correct action based on consequence to the model
Discriminating Consequences

- Noah is taught to imitate responses followed by reinforcement.
- And to say, “I don’t know” when responses are punished.
Current projects

- Observational learning of long response chains with teenagers / young adults
- Increasing social response as a result of OL
- Assessing OL in group instruction contexts
Observational learning of long response chains: effects of prompting attention
Learning social response via OL - SHARING
Incorporating OL strategies in group instruction
Future Directions

- Develop protocols that lead to more efficient learning
- Procedures for more “challenged” learners and older learners
- Expand the responses targeted - social responses, long response chains, vocal responses
- How do we empirically evaluate procedures to assess component responses while controlling for certain variables? (e.g., adult model versus peer model)
- Further refine a behavior analysis of OL (e.g., role of verbal behavior- rehearsing rules?, role of ‘self echoic’ - rehearsing content?)
Thank you!