Observational Learning and Children with Autism: From Research to Practice
Bridget A. Taylor, PsyD., BCBA-D
Thank You…

* Anca Dumitrescu
* Applied Behavioral Therapy Association
* Help Autism
Overview...

* Observational Learning
* Research to date with children with autism
* Curriculum considerations
* Current research directives
Implications ...

* Increase instructional efficiency
* Integration in more “typical learning” environments
* Acquiring social skills
* Economic 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)
Facial imitation for infants has been found to occur as early as a mean age of **32 hours old** (Meltzoff & Moore, 1983, 1989)
Developmental research on imitation of infants

* Children can imitate hand movements in the first six months of life (Meltzoff & Moore, 1977)
Deferred imitation has been documented in infants as young as six to nine months (Barr, Dowden & Hayne, 1996)

- Six to nine months – after a 24-hour delay
- Twelve months – after a four week delay
- Two year olds – after four months or longer
Imitation and children with autism

* First suggestion of a deficit in a paper by Ritvo & Provence, (1953)
* Deficits in imitation included as a specific deficit for identifying autism in young children (American Psychiatric Association, 1994)
* Systematic review by Williams, Whiten & Singh (2004)
  * Reviewed 21 studies – overall children with ASD performed worse on imitative tasks
Imitation and children with autism

* Teaching imitative repertoires early research (Bear et al. 1967; Lovaas et al. 1966; Metz, 1965; Risley & Wolf, 1967).
* Children with autism can learn to imitate a variety of responses (e.g., Ingersoll, 2010)
* Generalized imitation may be restricted to topographically similar response classes
  * (Young, Krantz, McClannahan & Poulson, 1994)
At the foundation of observational learning is imitation...

* But not all imitation is advantageous
Observational learning requires understanding of contingencies – the learner has to determine which responses he should incorporate in his repertoire and which ones he should not.
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

Observer attends to a complex stimulus that includes a modeled response and the subsequent consequence. Masia and Chase (1997)

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.
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.

This is discriminative for the observer to attend to the interaction.

**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 observer responds correctly, "four".

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 is discriminative for the observer to attend to the interaction

Complex discriminative stimulus for engaging in an alternative response to the modeled response
The observer says, "four"

This response is influenced by stimulus generalization, history of reinforcement for responding to the teacher’s instruction or for saying something different.

The teacher praises the observer for responding correctly.
Minimally observational learning requires attending listener behavior.

Discrimination

Imitation
Motivation?
Charlop, Shreibman, Tryon (1983)*
  - Receptive labeling task
Davies Lackey (2005)*
  - Reading dolch words
Dequinzio & Taylor (2015)
  - Discrimination of contingencies *
Egel, Richman & Koegel (1981)*
  - Shape, color, preposition discrimination
Goldstein & Mousetis (1989)
  - Language targets
Griffen, Wolery, & Schuster (1992)
  - Preparing recipes
Ledfort & Wolery (2013)
  - Academic and social response
MacDonald & Ahearn (2015)*
  - Assessment and teaching
Ogden (1995)
  - Reading sight words
Pereira-Delgado and Greer (2009)*
  - Peer monitoring
Rehfeldt, Latimore & Stromer (2003)*
  - Stimulus class formation
  + Werts, Caldwell, Wolery (1996)
  + Long response chains
  * Taylor, DeQuinzio & Stine (2012)*
  * Reading with a monitoring response
  - Long response chain

*participants with autism
Observational Learning as an independent variable (e.g., will a child learn new sight words as a result of observing a competent model display these responses and be reinforced for these responses?)

* Unclear what leads to increase in performance

* Only a few studies have examined observational learning as a dependent variable (e.g., will a child learn new sight words during observational learning sessions if they are taught to discriminate the contingencies applied to the model)
Would children with autism learn new responses by observing a competent model perform those responses?

Tested acquisition of new site words following observation sessions.
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
INCREASING OBSERVATIONAL LEARNING OF CHILDREN WITH AUTISM: A PRELIMINARY ANALYSIS
BRIDGET A. TAYLOR, JAIME A. DEQUINZIO, AND JAIME STINK
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 vocal imitation and matching response related to a peer’s reading response. In another condition, participants were exposed only to a peer’s reading responses. Participants read the words more accurately during test 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.

Key words: 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 (Carania, 2007). Research has demonstrated that children with autism do not readily learn by observing others (Varni, Lovaas, Koegel, & Everett, 1979), and they show deficits in skills that may be associated with observational learning, such as attending (Patten & Watson, 2011) and imitating (Williams, White, & 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, & Tyrone, 1983; Rehfeldt, Latimore, & Stromer, 2003; Werts, 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 matching response. 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 5 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, <1.9 years, and 2 years, respectively. Three 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 implemented...
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
What we found

* 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

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<tr>
<td>1</td>
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<tr>
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<tr>
<td>5</td>
<td>80%</td>
</tr>
<tr>
<td>6</td>
<td>100%</td>
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</tbody>
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Exposure Set

Training Set

two-week maintenance
two-month maintenance
Percentage of Words Read Correctly During Test Sessions

Eric

Training Set

Exposure Set

three-week maintenance
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
Will participants imitate modeled responses if a differential consequence is provided:

* Responses that lead to a direct outcome (edible)
  * Direct reinforcement
  * Extinction trials / no reinforcement

Preliminary assessment

Get candy
Edible Consequence Provided to Model
Test-0s Delay

% of responses that conform to the contingency

Paul

Kevin

Matt

Sessions
Will participants imitate modeled responses if a differential consequence is provided: teacher feedback

- Praise / reinforcement
- Punishment

Preliminary assessment

No, that's wrong

You're right!

Touch block
Punished trials
What we found

* Participants more often imitated the responses and avoided imitating responses accurately when outcome / consequence was direct access to tangible

* 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) by teaching child with autism to indicate discrimination of the contingencies by imitating the responses that are reinforced, and saying, “I don’t know” to responses that were followed by punishment.

Looked at acquisition of unknown labels in two conditions.
Two Sets of unknown labels

Child exposed to two conditions

Exposure of instruction between teacher and adult

Exposure of instruction with opportunity to imitate the adult and prompts for saying, “I don’t know” when the model is incorrect

Teacher presents trial to adult and delivers one of two consequences

Reinforcement: “Good, that’s right” and access to iPad

Punishment: “No that’s wrong” and no “iPad”
Learning to discriminate correct from incorrect responses
Curriculum considerations

- attending
- imitation
- listener behavior
- discrimination of contingencies
Variables to consider

* Types of responses
  * Motor (e.g., uses correct tool to open the box)
  * Vocal (e.g., mands, tacts, intraverbals)
  * Receptive (e.g., points accurately to pictures following model)
  * Social (e.g., sits next to peer after observing a model be reinforced for the response)
  * Other academic responses (e.g., concept formation)
Variables to consider

* Imitation with no delay, with a delay
* Learning versus Performance
  * Increasing skills already in learner’s repertoire
  * Teaching a new skill
* Access to reinforcement / no access to reinforcement
* Functionality of the consequences provided for model’s response
Attending

* Makes eye contact with adults
* Visually tracks adult’s actions
* Looks at peers when instructed
* Visually tracks peers when instructed
* Visually tracks peer’s actions
* Looks at peers and adults for increased durations
Attending

* Observes multiple actions at the same time
  * Tacts actions after viewing
* Observes increased number of actions at the same time
  * Tacts actions after viewing
  * Tacts actions after increased interval of time
Attending

* Observes multiple actions at the same time
  * Tacts actions after viewing
* Observes increased number of actions at the same time
  * Tacts actions after viewing
  * Tacts actions after increased interval of time
Common imitation program...

* Imitation of motor movements (gross, fine, facial)
* Imitation with objects
* Imitation of sounds / words / sentences
* Imitation of sounds / words with movements
* Imitation of a completed action
* Imitation of a sequence
* Block imitation
* etc.
Imitating

* Generalized motor, object, and vocal imitation
  * Adult
  * Peer
* Imitates actions of others when instructed “Do what (person) is doing / did”
* Imitation of actions that lead to a desired outcome
  * Operation of toys
  * Access to tangible
* Retention of modeled actions
  * Increased delays in time
Peer Imitation
Imitation of actions that lead to a desired outcome
Deferred imitation
Imitation of a group
Imitating behavior followed by praise
Avoids imitating responses followed by “negative” consequence
Discriminating Consequences

* Tacts consequences
  * Praise
  * Punishment
  * No reinforcement
Discriminating Consequences

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

* Increasing social response as a result of OL
* Assessing OL in group contexts
* Teaching “self-echoic” response and assessing effects in acquiring novel responses in OL contexts
* Assessing acquisition while observing another acquire novel skills
Learning social response via OL

* BL sharing responses alone condition
* Treatment 1 adult model
* Treatment 2 adult model and observed reinforcement
* Probes continue across treatment
Variables that might influence learning in a group

* Attending to teacher and model
* Prompts to repeat model (imitation)
* Saying responses out loud
Role of self-echoic

* Palmer (2012)
* Results of Taylor and Dequinzio (2012)

THIS CHILD DOES NOT HAVE AUTISM
Teaching self-echoic

* Identify tactics child doesn’t know
* Observes competent model
* Teaching sequence
  * Recalls and repeats tact out loud
  * Whispers
  * “mouths” the word
Future Directions

* Obtain normative data on components.
* Continue to identify the component responses of OL.
* Protocols and procedures for more challenged learners.
* Extending protocols to group instruction and social responses.
* How do we empirically evaluate procedures to assess component response while controlling for certain variables? (e.g., adult model versus peer model)
Thank you!