Improving Social Behavior Using Pairing, Video Modeling, and Tactile Prompting

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The kids, families, and teachers

Overview

1. Review recent research on social skills and autism
2. Conditioning praise as a reinforcer
3. Teaching responses to facial expressions
4. Recommendations for research and practice

Diagnostic Criteria for ASD (DSM-5)

Deficits in social-emotional reciprocity

- Failure of back-and-forth **conversation**
- Failure to **initiate or respond to social interactions**

Deficits in nonverbal communication

- Abnormalities in **eye contact** and **body language**
- Deficits in understanding and using **gestures**
- Lack of **facial expressions** and nonverbal communication

Deficits in developing and maintaining relationships

- Difficulty adjusting to social contexts
- Difficulty **sharing imaginative play** or **making friends**
- Absence of interest in peers

DSM-5

Table 2 Severity levels for autism spectrum disorder

Severity level	Social communication
Level 3 "Requiring very substantial support"	Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.
Level 2 "Requiring substantial support"	Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and who has markedly odd nonverbal communication.
Level 1 "Requiring support"	Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful responses to social overtures of others. May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.

Review of Recent Research

Search: autism + social + behavior analysis

14 studies in the past 5 years

- Playing and sharing
- Social communication: initiations and responses
- Identifying social reinforcers
- Assessing and reducing inappropriate social behaviors
- Teaching safety skills
- Teaching empathic responding

Remove the Adults!

1. Picture Activity Schedules
2. Video Modeling
3. Script Training and Fading

With adults

1. Teaching Interaction Procedure
2. Social Stories

Participants – Number and Ages

Study	# Participants	Ages
Broadhead et al. (2014)	6	3-5
MacDonald et al. (2009)	2	5-7
Marzullo-Kerth et al. (2011)	4	7-8
Jones et al. (2014)	4	4-6
Paden et al. (2012)	2	7-9
Garcia-Albea et al. (2014)	4	4-6
Leaf et al. (2012)	6	5-13

Playing and Sharing

1. The use of linked activity schedules to teach hide-and-seek. (2014)
2. Using video modeling to teach reciprocal pretend play. (2009)
3. Using multiple-exemplar training to teach a generalized repertoire of sharing. (2011)

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2014, **47**, 1–6 NUMBER 3 (FALL)

THE USE OF LINKED ACTIVITY SCHEDULES TO TEACH CHILDREN WITH AUTISM TO PLAY HIDE-AND-SEEK

MATTHEW T. BRODHEAD, THOMAS S. HIGBEE, JOY S. POLLARD, JESSICA S. AKERS, AND KRISTINA R. GERENCSER

UTAH STATE UNIVERSITY

Linked activity schedules were used to establish appropriate game play in children with autism during a game of hide-and-seek. All 6 participants demonstrated acquisition of appropriate play skills in the presence of the activity schedules and maintained responding during subsequent phases. When the schedules were removed, responding decreased to baseline levels, demonstrating that the schedules controlled responding. Implications for future research on the use of activity schedules to teach social behavior are discussed.

Key words: activity schedules, autism, social interactions

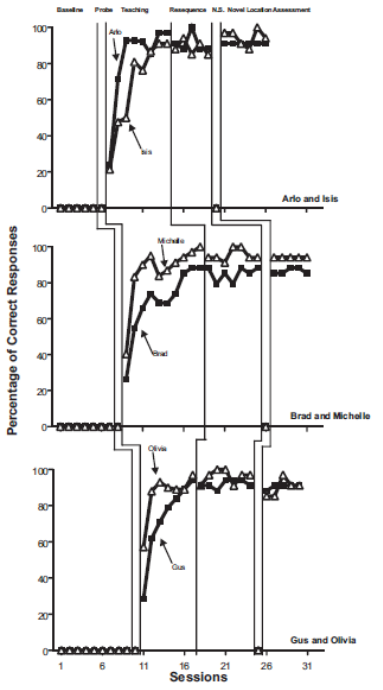
Figure 1. The pages for the hider (left) and seeker (right).

Condition	Hider	Seeker
Beginning	Open schedule[a]	Open schedule[a]
Middle	Attend to hiding place[a]	Say, "go hide!"
	Put "oh, no!" script on wrist	Look at peer
	Arrive at hiding place	Count from 1 to 20
	Wait at hiding place	Put "I found you!" script on wrist[a]
		Grab searching cue[a]
		Search for peer
	Say, "oh, no!"	Say, "I found you!"
	Return to schedule[a]	Return to schedule[a]
	Place "oh, no!" script on schedule[a]	Place "I found you!" script on schedule[a]
		Return searching cues[a]
	Turn page[a]	Turn page[a]
End	Say, "Thanks for playing!"	Say, "Thanks for playing!"

Note. Each participant played each role twice.
[a]Denotes schedule behavior only.

Graduated guidance

- Full physical prompts, faded with improvement
- Script fading – last word faded first



Participants alternated between hider and seeker

Participants increased hide-and-seek game-playing skills, with novel locations

Did not respond with activity schedule alone

Did not play when activity schedule was taken away

- Should they be faded?
- Do children with autism always need activity schedules (like planners)?

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2009, **42**, 43–55 NUMBER 1 (SPRING 2009)

USING VIDEO MODELING TO TEACH RECIPROCAL PRETEND PLAY TO CHILDREN WITH AUTISM

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The purpose of the present study was to use video modeling to teach children with autism to engage in reciprocal pretend play with typically developing peers. Scripted play scenarios involving various verbalizations and play actions with adults as models were videotaped. Two children with autism were each paired with a typically developing child, and a multiple-probe design across three play sets was used to evaluate the effects of the video modeling procedure. Results indicated that both children with autism and the typically developing peers acquired the sequences of scripted verbalizations and play actions quickly and maintained this performance during follow-up probes. In addition, probes indicated an increase in the mean number of unscripted verbalizations as well as reciprocal verbal interactions and cooperative play. These findings are discussed as they relate to the development of reciprocal pretend-play repertoires in young children with autism.

DESCRIPTORS: autism, pretend play, video modeling

MacDonald et al. (2009)

Each video had 14-17 scripted verbalizations

- Adult models

Three play sets:

- Airport – "We need gas," put in gas, "I'll get my suitcase"
- Zoo – Polar bear → "Can I feed him?" "Sure, he loves fish"
- Grill – "Let's check our food," "I think it's ready"

Measured scripted and unscripted verbalizations and actions, and cooperative play (4-min play sessions)

MacDonald et al. (2009)

Video model – watched twice and then told to play

No prompting or reinforcement

Video modeling might work well because they show play behaviors without distractions inherent in the natural environment

Student have a history of reinforcement for imitating others

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2011, 44, 279–294 NUMBER 2 (SUMMER 2011)

USING MULTIPLE-EXEMPLAR TRAINING TO TEACH A GENERALIZED REPERTOIRE OF SHARING TO CHILDREN WITH AUTISM

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The current study examined the utility of multiple-exemplar training to teach children with autism to share. Stimuli from 3 of 4 categories were trained using a treatment package of video modeling, prompting, and reinforcement. Offers to share increased for all 3 children following the introduction of treatment, with evidence of skill maintenance. In addition, within-stimulus-category generalization of sharing was evident for all participants, although only 1 participant demonstrated across-category generalization of sharing. Offers to share occurred in a novel setting, with familiar and novel stimuli, and in the presence of novel adults and peers for all participants during posttreatment probes.

Key words: autism, generalization, multiple-exemplar training, social behavior, sharing, video modeling

Marzullo-Kerth et al. (2011)

Video models

- Two peers sharing an activity
- 6 video models per child; 8-10 seconds in duration
- Taught sharing with many items (multiple exemplar instruction)

Measured: offers to share

1. Motor – holds out item
2. Verbal – "Do you want to try?"

Non-sharing items: worksheets, towel, clothing

Video Model Content

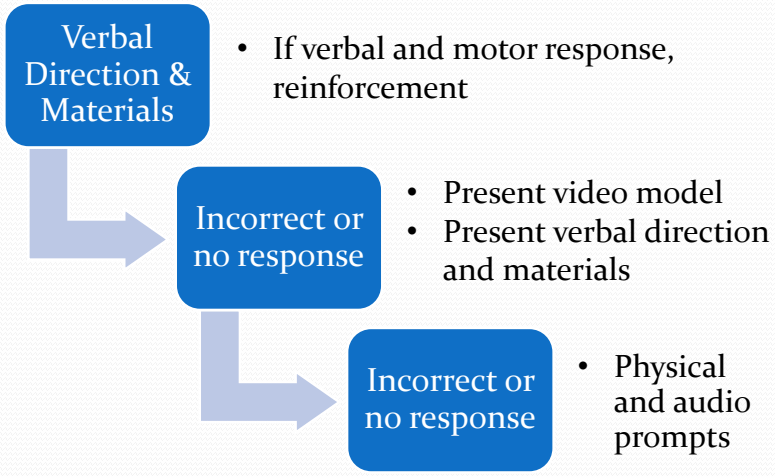
Verbal Responses

- "Would you like to try this?"
- "Do you want to try?"
- "Try this"
- "Do you want to try?"
- "Here, you try it"
- "Why don't you try?"
- "Would you like to try this?"

Stimuli

- Cookies
- Cars
- Magnets
- Velcro mitt and ball
- Pretzel
- Ball
- Play-doh
- Colored pencils
- Football

Procedures



Marzullo-Kerth et al. (2011)

- All four children increased sharing behaviors
- All children shared with untaught items
- All children shared in a novel setting, novel peer
- Children did not share with mundane objects
- 3 children maintained sharing behaviors
- All children emitted unscripted offers to share

"Sharing a highly preferred item may be aversive"
Sharing more likely when multiple items

Social Communication: Initiations and Responses

1. Teaching engaging in peer-directed mands using a picture exchange communication system. (2012)
2. Using audio script fading and multiple-exemplar training to increase vocal interactions. (2014)
3. Assessing stimulus control and promoting generalization via video modeling when teaching social responses. (2014)

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2012, **45,** 425–429 NUMBER 2 (SUMMER 2012)

TEACHING CHILDREN WITH AUTISM TO ENGAGE IN PEER-DIRECTED MANDS USING A PICTURE EXCHANGE COMMUNICATION SYSTEM

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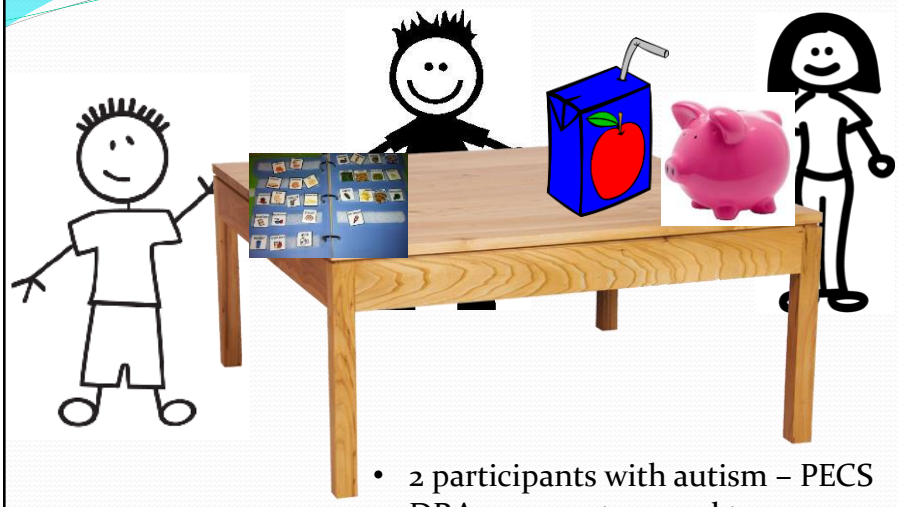
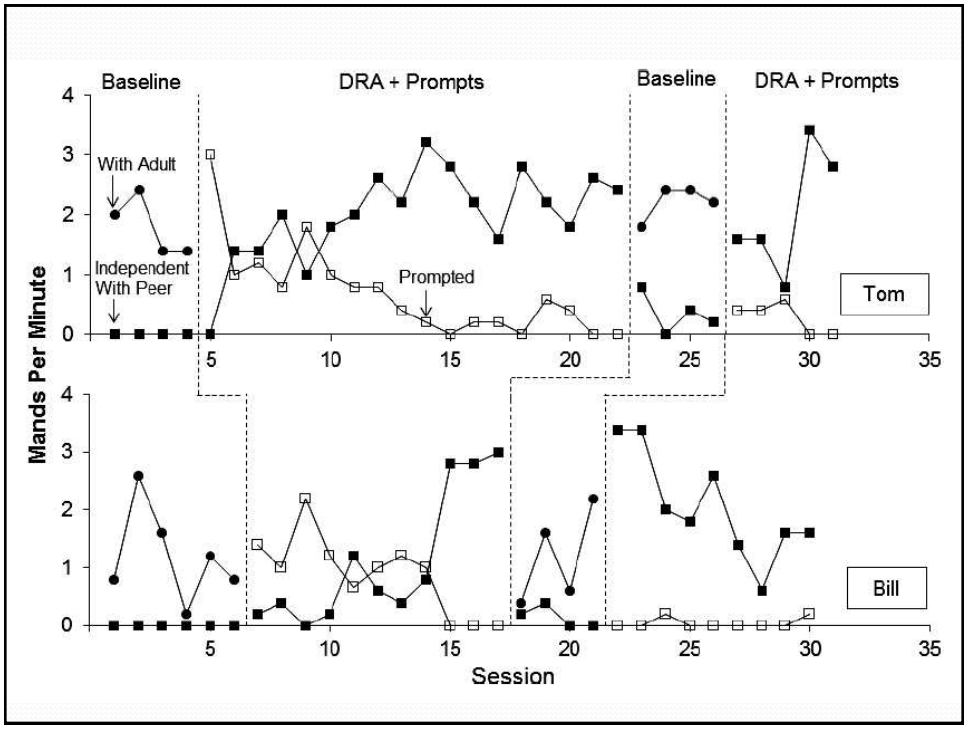
UNIVERSITY OF NEBRASKA MEDICAL CENTER

We evaluated differential reinforcement of alternative behavior (DRA) plus prompting to increase peer-directed mands for preferred items using a picture exchange communication system (PECS). Two nonvocal individuals with autism participated. Independent mands with a peer increased with the implementation of DRA plus prompting for both participants. In addition, peers engaged in brief social interactions following the majority of mands for leisure items. These results suggest that teaching children to use PECS with peers may be one way to increase manding and social interactions in individuals with limited or no vocal repertoire.

Key words: autism, differential reinforcement of alternative behavior, mand, picture exchange communication system, social interactions



- 2 participants with autism – PECS
- DRA + prompts: mand to peer
- 69% of trials – social interaction



Paden et al. (2012)

Fewer mands with peers in baseline

- More history of reinforcement for mands with adults
- Adults reinforce mands more immediately

Limitations, future research, practice

- Peers did not always take PECS card and reinforce; therapist had to prompt reinforcement
- Need to teach mands away from the table – moving around
- Could incorporate reinforcers that were more social – games

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2014, 47, 325–343 NUMBER 2 (SUMMER)

USING AUDIO SCRIPT FADING AND MULTIPLE-EXEMPLAR TRAINING TO INCREASE VOCAL INTERACTIONS IN CHILDREN WITH AUTISM

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AND

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Script-fading procedures have been shown to be effective for teaching children with autism to initiate and participate in social interactions without vocal prompts from adults. In previous script and script-fading research, however, there has been no demonstration of a generalized repertoire of vocal interactions under the control of naturally occurring relevant stimuli. In this study, 4 boys with autism were taught to initiate a conversation in the presence of toys through the use of a script and script-fading procedure. Training with multiple categories and exemplars of toys was used to increase the likelihood of generalization of vocal interactions across novel toys. A multiple-probe design across participants was used to assess the effects of these procedures. The intervention successfully brought interactions by children with autism under the control of relevant stimuli in the environment. Future research pertaining to the specific implementation of these procedures (e.g., fading, script placement, participant characteristics) is discussed.

Key words: autism, multiple-exemplar training, scripts, script fading, spontaneous language

Stimuli and Target Behaviors

Determined by observing typical children

Category	Sample Toy	Scripts
Vehicle	Car	"Check this out!"
		"Look, it's red"
		"Cars go beep"
Instruments	Piano	"I can play piano"
		"It's black"
		"Watch me hit the keys"
Balls	Soccer ball	"I have the soccer ball!"
		"It's black and white"
		"Let's kick it!"

	Taught (general case)	Gen probes
Dan	Balls, animals, buildings	Instruments
Justin	Instruments, balls, vehicles	Action figures
James	Vehicles, animals, action figures	Balls
Adam	Building materials, instruments, action figures	Vehicles

Dependent Measures

Category of Interaction	Type
Initiations	Scripted
(said before partner)	Unscripted
	Novel
	In Vivo Scripted
	In Vivo Unscripted
Elaborations	Scripted
(said after partner)	Unscripted
	Novel
	In Vivo Scripted
	In Vivo Unscripted
	Acknowledgements
Generalized Interactions	Within Category
	Across Category

Child: “I like to play soccer”
Adult: “Soccer is my favorite”

- Dropped edible in cup
- Play with toy for 30 seconds

Faded scripts to partial

- If error: played full script

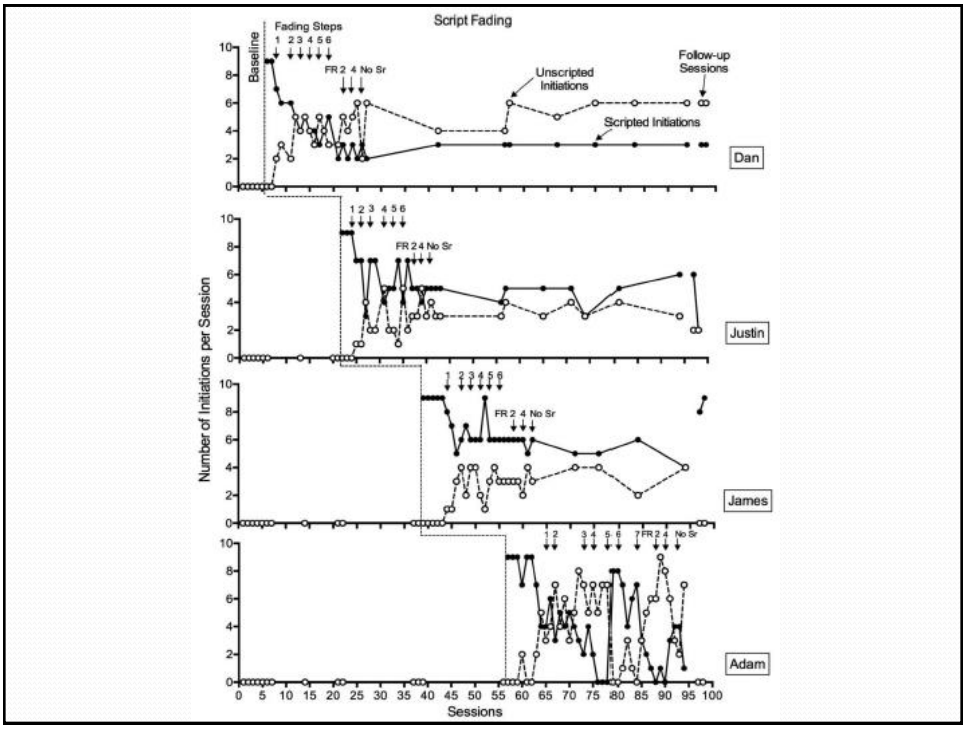
Physical prompts to

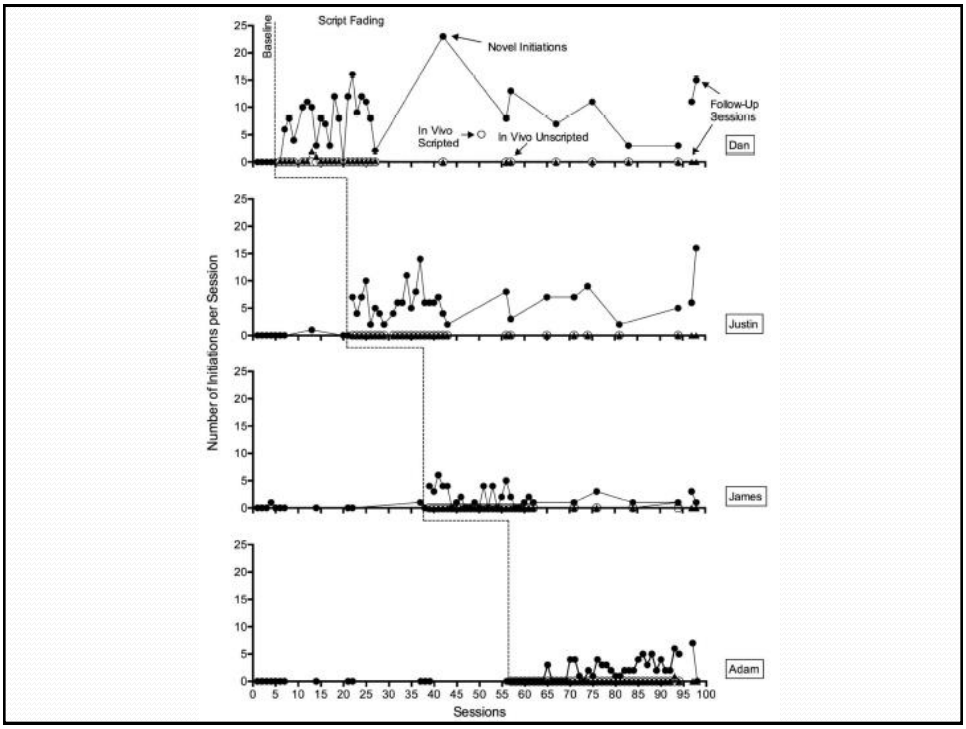
- Push button
- Look at therapist

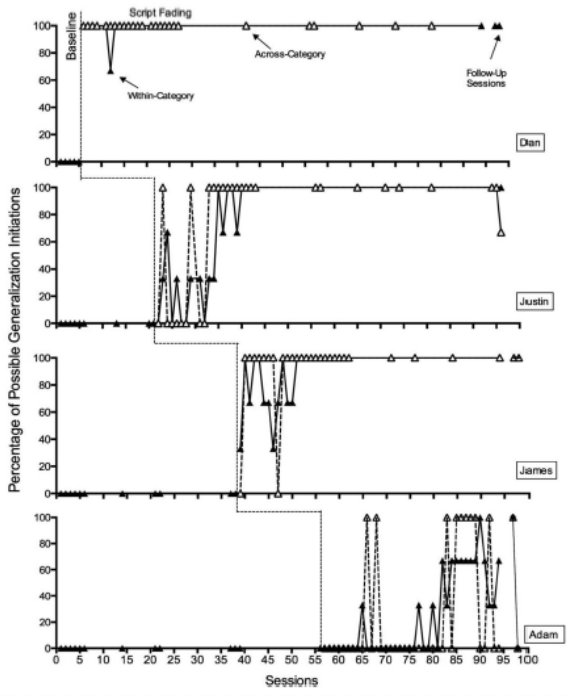
Table 3
Fading Levels Used During Script Fading

Fading level	Script content
0	Full script
1	Last word removed
2	Last two words removed
3	All but the first word removed
4	All but the first word removed on three stimuli and no script on six stimuli
5	All words removed from audio recorder
6	No scripts (i.e., recorder removed)
7[a]	No scripts (assistant presses recorder during prompts)

[a]Level 7 was used only for Adam.


Script Fading
Fading Steps
1 2 3 4 5 6
Baseline
FR 2 4 No Sr
Unscripted Initiations
Follow-up Sessions
Scripted Initiations
Dan
Justin
James
Adam
Number of Initiations per Session
Sessions


Script Fading
Baseline
Novel Initiations
In Vivo Scripted
In Vivo Unscripted
Follow-Up Sessions
Dan
Justin
James
Adam
Number of Initiations per Session
Sessions



Garcia-Albea et al. (2014)

Not much elaboration: played with toy, no teaching

Need more variety of toys:

- More engaging
- More generalization

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2014, 47, 37–50 NUMBER 1 (SPRING)

ASSESSING STIMULUS CONTROL AND PROMOTING GENERALIZATION VIA VIDEO MODELING WHEN TEACHING SOCIAL RESPONSES TO CHILDREN WITH AUTISM

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We taught social responses to young children with autism using an adult as the recipient of the social interaction and then assessed generalization of performance to adults and peers who had not participated in the training. Although the participants' performance was similar across adults, responding was less consistent with peers, and a subsequent probe suggested that the recipient of the social behavior (adults vs. peers) controlled responding. We then evaluated the effects of having participants observe a video of a peer engaged in the targeted social behavior with another peer who provided reinforcement for the social response. Results suggested that certain irrelevant stimuli (adult vs. peer recipient) were more likely to exert stimulus control over responding than others (setting, materials) and that video viewing was an efficient way to promote generalization to peers.

Key words: generalization, social skills, video viewing

Jones, Lerman, & Lechago (2014)

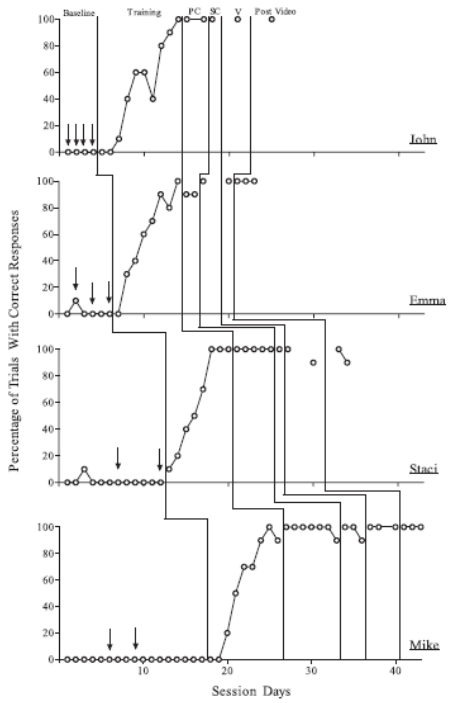
Target responses:

- Therapist took iPad → "Give it back please"
- 1-min timer goes off → "My turn"
- "Give me something to play with" → "What do you want?"

Role play with adult and peer

- Bluetooth device cued peer what to do

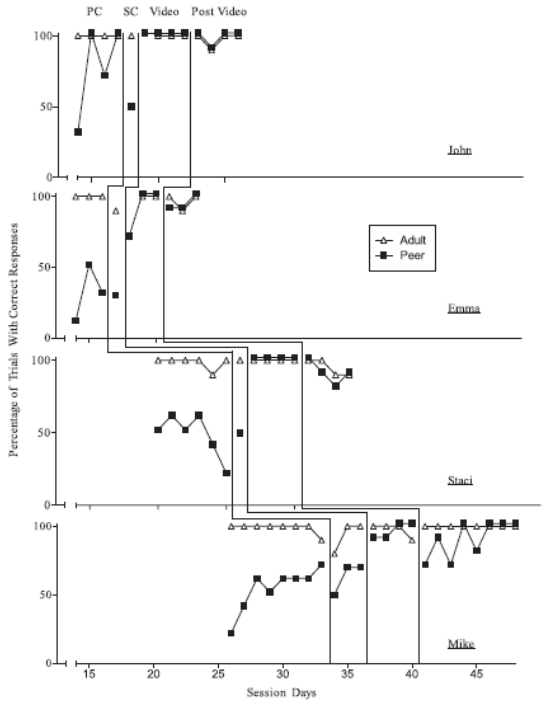
Training: most-to-least prompting (verbal)



PC = person change

SC = stimulus change

V = watched video of peer



PC = person change

SC = stimulus change

V = watched video of peer

Jones, Lerman, & Lechago (2014)

Results: generalization to adults, but not peers

Controlled for other stimuli: materials, location

- Only peer influenced less responding

Maybe gender: adults were female; peers were male

- Probably not

Similar procedural integrity with adults and peers

- "My turn" – peer did not always hand over, but usually

More animation, enthusiasm with adults than peers

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2012, **45**, 281–298 NUMBER 2 (SUMMER 2012)

COMPARING THE TEACHING INTERACTION PROCEDURE TO SOCIAL STORIES FOR PEOPLE WITH AUTISM

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UNIVERSITY OF KANSAS

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MITCHELL TAUBMAN, JOHN MCEACHIN, JAMISON DAYHARSH, AND RONALD LEAF

AUTISM PARTNERSHIP

This study compared social stories and the teaching interaction procedure to teach social skills to 6 children and adolescents with an autism spectrum disorder. Researchers taught 18 social skills with social stories and 18 social skills with the teaching interaction procedure within a parallel treatment design. The teaching interaction procedure resulted in mastery of all 18 skills across the 6 participants. Social stories, in the same amount of teaching sessions, resulted in mastery of 4 of the 18 social skills across the 6 participants. Participants also displayed more generalization of social skills taught with the teaching interaction procedure to known adults and peers.

Key words: autism, behavioral skills training, social skills, social stories, teaching interaction

Leaf et al. (2012) – Skills Taught

- Losing graciously
- Sportsmanship
- Giving compliments
- Cheering up a friend
- Showing appreciation
- Reciprocal compliments
- Negotiation
- Appropriate greetings
- Changing the conversation
- Providing assistance
- On-topic conversation
- Showing off work
- Explaining a "cool" event
- Showing interest
- Clarifying instructions
- Interrupting
- Joining into a game
- Disagreeing appropriately

Leaf et al. (2012) – Skills Taught

Teaching Interaction

- State skill of the day
- State rationale for skill
- State when to use the skill
- Name all steps in order
- Therapist modeled skill
- Child stated if correct
- Child role-played the skill

Social Stories

- Descriptive, perspective, affirmative, directive
- Pictures and text
- Therapist read story
- Comprehension questions
  - What book about?
  - When display behavior?
  - Why display behavior?
  - What are the steps?

Both:

Correct: tickets, praise; Incorrect: prompts

Leaf et al. (2012) – Results

- Teaching Interaction Procedure: mastered 18/18
- Social Stories: mastered 4/18

More generalization to novel adults and peers in TIP

Need modeling and role play

Explanation: probe procedure more like TIP (role play)

MacDonald et al. (2009)

Reinforcement for social behaviors

"Acquiring play skills may also make it more likely that natural social consequences for interaction will come to exert an influence on the behavior of children with autism. That is, social consequences that were ineffective may come to have some value for these children through this training."

Reinforcers in Recent Studies

Study	Reinforcers
Brodhead et al. (2014)	Praise, small edible
MacDonald et al. (2009)	None
Marzullo-Kerth et al. (2011)	Accept, confirm, manipulate, token (video game, snacks, toys)
Jones et al. (2014)	Praise, edible
Paden et al. (2012)	Tangible item (manded)
Garcia-Albea et al. (2014)	Edibles
Leaf et al. (2012)	Praise, tokens (tangible items, activities)

Verbal Operants (Skinner, 1957)

	Antecedent	Behavior	Consequence
Mand	Motivating operation	"Book"	Specific SR+ (book)
Tact	Nonverbal stimulus	"Book"	Generalized Cond. Social SR+ (e.g., "Oh," "Yes")
Listener Responding	Verbal stimulus Nonverbal stimuli	Touch, point to book	Generalized Cond. Social SR+
Echoic	Verbal stimulus – model	"Book" – repeats model	Generalized Cond. Social SR+
Intraverbal	Verbal stimulus	"book" – not in antecedent	Generalized Cond. Social SR+

The Behavior Analyst 2004, 27, 197–207 No. 2 (Fall)

Toward a Behavioral Analysis of Joint Attention

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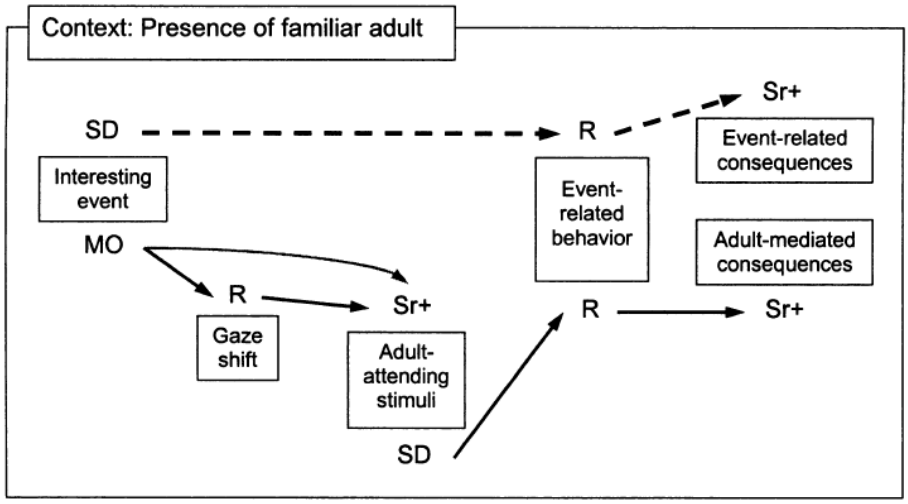
William L. Holcomb, and William H. Ahearn
New England Center for Children

Joint attention (JA) initiation is defined in cognitive-developmental psychology as a child's actions that verify or produce simultaneous attending by that child and an adult to some object or event in the environment so that both may experience the object or event together. This paper presents a contingency analysis of gaze shift in JA initiation. The analysis describes reinforcer-establishing and evocative effects of antecedent objects or events, discriminative and conditioned reinforcing functions of stimuli generated by adult behavior, and socially mediated reinforcers that may maintain JA behavior. A functional analysis of JA may describe multiple operant classes. The paper concludes with a discussion of JA deficits in children with autism spectrum disorders and suggestions for research and treatment.

Key words: joint attention, social reinforcer, development, autism



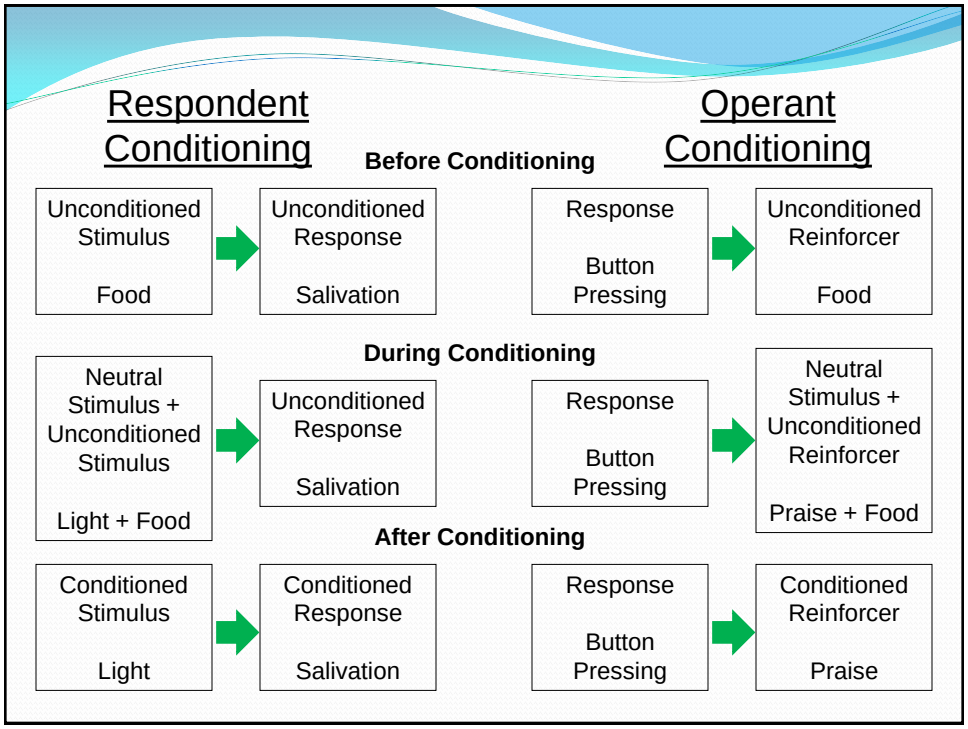
Problem!

- Praise and attention not reinforcers for all children
- Attention is reinforcer for all verbal operants except mand
- Generalization and maintenance are unlikely without generalized conditioned social reinforcers
- Primary reinforcers: more time to consume than praise
- Edible reinforcers are unhealthy
- We are told to pair praise with reinforcers: research?

Contingent Pairing to Establish Praise as a Reinforcer with Children with Autism

OR

Towards Establishing a Generalized Social Conditioned Reinforcer



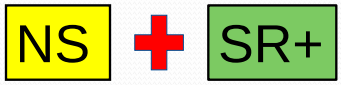
Conditioned Reinforcement

- Tokens: contingent pairing (Moher et al., 2008)
- Books: observational intervention (Singer-Dudek et al., 2011)
- Sounds: stimulus-stimulus pairing (Petursdottir et al., 2011)
- Nods and smiles: paired with toys (Isaksen & Holth, 2009)
- Praise (psychiatric disorders; e.g., schizophrenia)
  - Pairing with biological reinforcers (Miller & Drennen, 1970)
  - Pairing with removal of aversive stimuli (Caulfield & Martin, 1976; Lovaas et al., 1965)
  - Pairing with tokens (Jones & Kazdin, 1975; Stahl et al., 1974)

3 Types of Conditioning

1. **Discrimination training**

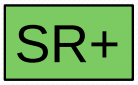
2. **Noncontingent pairing**



3. **Contingent pairing**

For all,

becomes



3 Types of Conditioning

1. **Discrimination training**
   - Lovaas et al. (1966)
   - Isaksen & Holth (2009)
   - Taylor-Santa (2014)
2. **Noncontingent pairing**
   - Dozier et al. (2012)
3. **Contingent pairing**
   - Dozier et al. (2012)

Behavioral Interventions
Behav. Intervent. **24**: 215–236 (2009)
Published online 11 August 2009 in Wiley InterScience
(www.interscience.wiley.com) **DOI**: 10.1002/bin.292

AN OPERANT APPROACH TO TEACHING JOINT ATTENTION SKILLS TO CHILDREN WITH AUTISM

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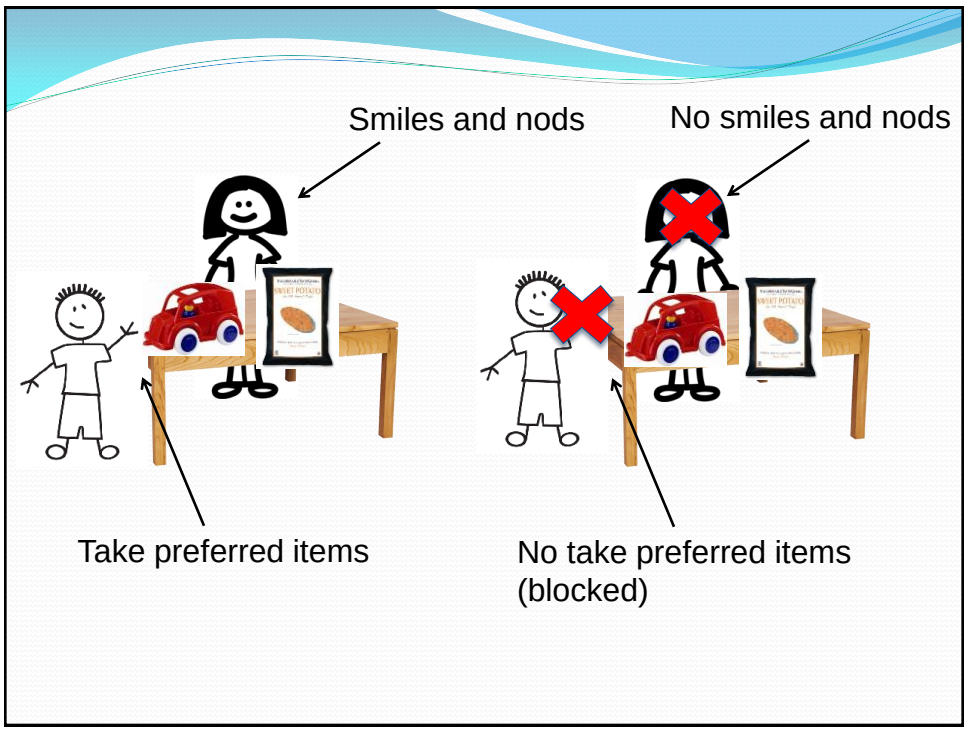
A lack of joint attention skills may constitute a core impairment in autism. In the present study, a training protocol was developed, based on the literature on joint attention and on behavioral interventions. The training was organized into a sequence of three main parts respectively aimed at establishing each of the following skills: (1) responding to joint attention bids, (2) engaging in turn-taking activities based on joint attention skills, and (3) initiating joint attention. Two novel components were incorporated in the training: (a) a discrimination training procedure aimed at establishing the adult's nods as conditioned reinforcers and (b) tasks based on turn-taking, where joint attention skills were targeted and reinforced. The study was conducted according to a single-subject experimental design, in which joint attention skills were measured before and after intervention, using the "behavioral assessment of joint attention." Four 3.5–5.5 year-old children diagnosed with autism participated in the study. All four children completed the training successfully and made significant progress in engaging in joint attention and in initiating joint attention skills. Following the completion of training and at 1 month follow-up, parents reported that their children used their skills in different settings. Moreover, at follow-up, all four children were reported to engage in joint attention behaviors and to enjoy doing so.



Behavioral Interventions
Behav. Intervent. **29**: 157–176 (2014)
Published online 12 March 2014 in Wiley Online Library
(wileyonlinelibrary.com) **DOI**: 10.1002/bin.1384

A DISCRIMINATION TRAINING PROCEDURE TO ESTABLISH CONDITIONED REINFORCERS FOR CHILDREN WITH AUTISM†

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Although conditioned reinforcers are used in many behavioral intervention programs for individuals with developmental disabilities, little research has been conducted to determine optimal methods for establishing conditioned reinforcers. An early method that has received relatively little research attention is to condition a neutral stimulus as a discriminative stimulus and then use the stimulus as a programed consequence during skill acquisition. The current study evaluated the effects of a discrimination training procedure on establishing conditioned reinforcers for three children with autism. For all participants, previously neutral stimuli reinforced behaviors after acquiring discriminative properties during discrimination training.

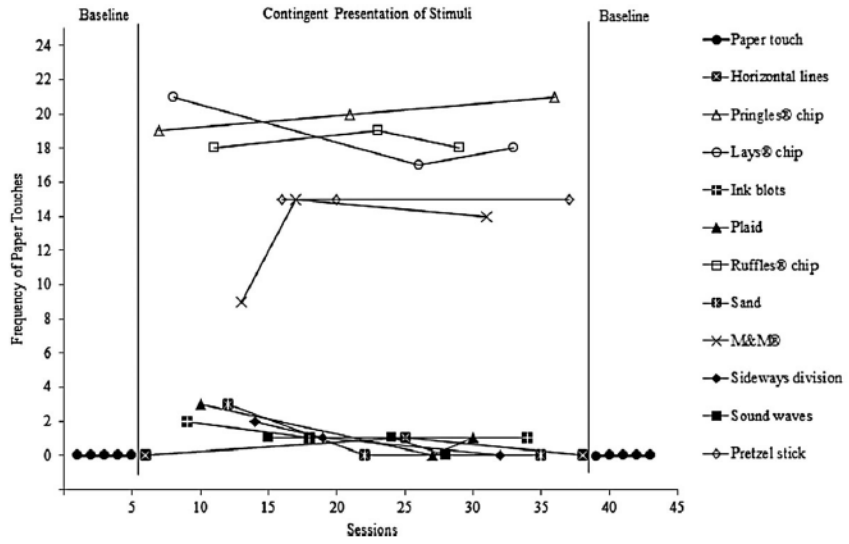
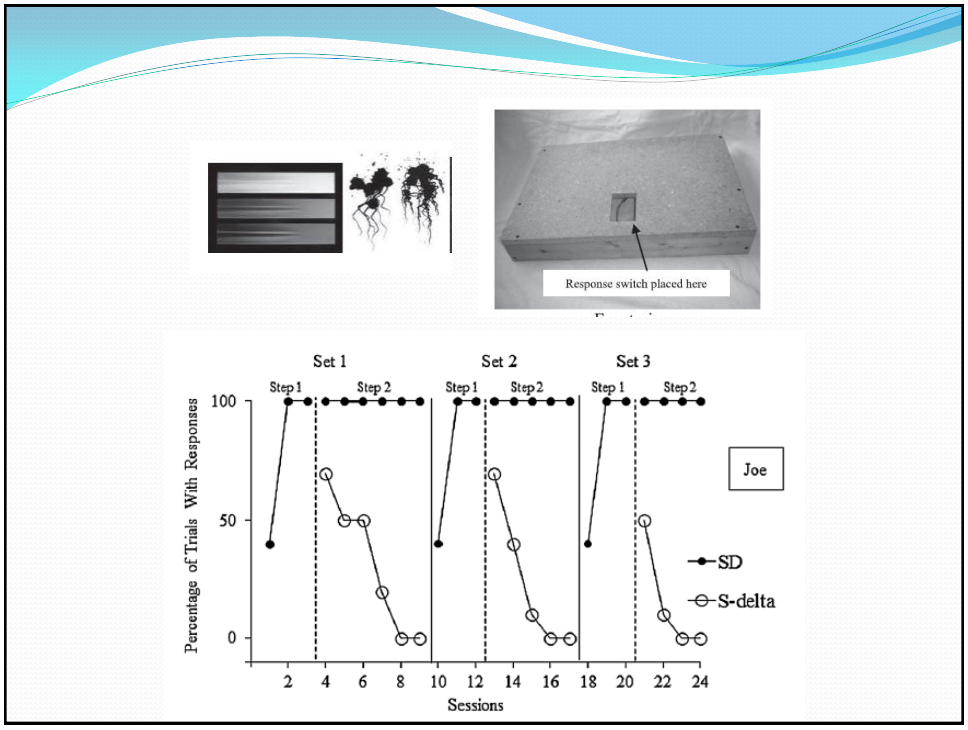
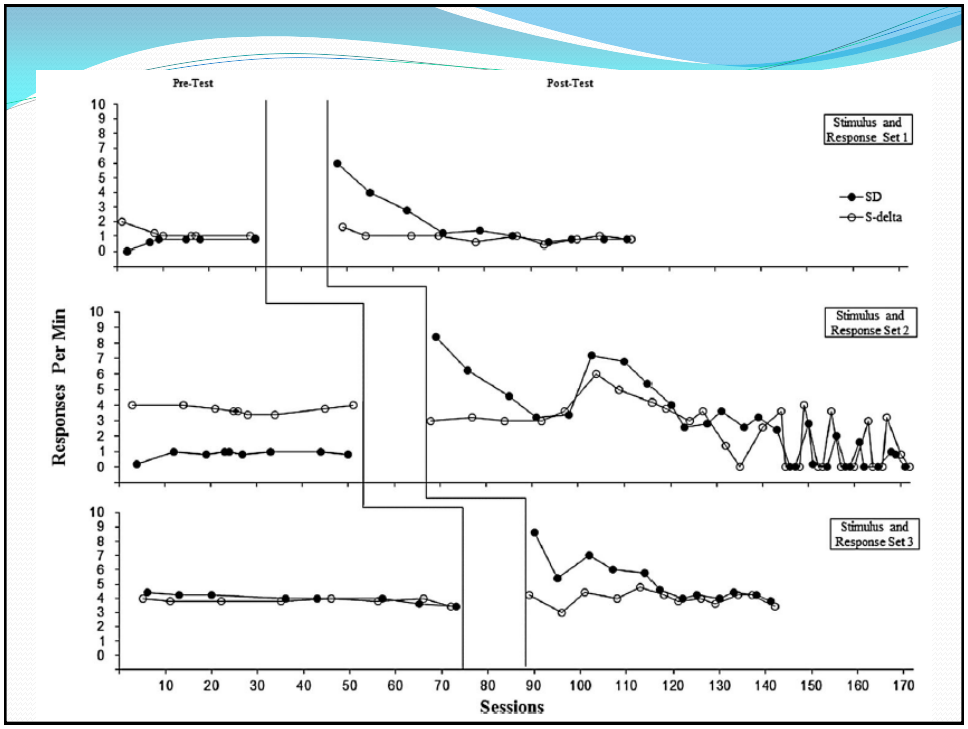


Figure 1. Stimulus assessment data for Marc.


Response switch placed here
Set 1
Set 2
Set 3
Step 1
Step 2
Percentage of Trials With Responses
100
50
0
2
4
6
8
10
12
14
16
18
20
22
24
Sessions
Joe
SD
S-delta


Pre-Test
Post-Test
Stimulus and Response Set 1
Stimulus and Response Set 2
Stimulus and Response Set 3
SD
S-delta
Responses Per Min
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
Sessions

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2012, **45**, 721–735 NUMBER 4 (WINTER 2012)

A COMPARISON OF TWO PAIRING PROCEDURES TO ESTABLISH PRAISE AS A REINFORCER

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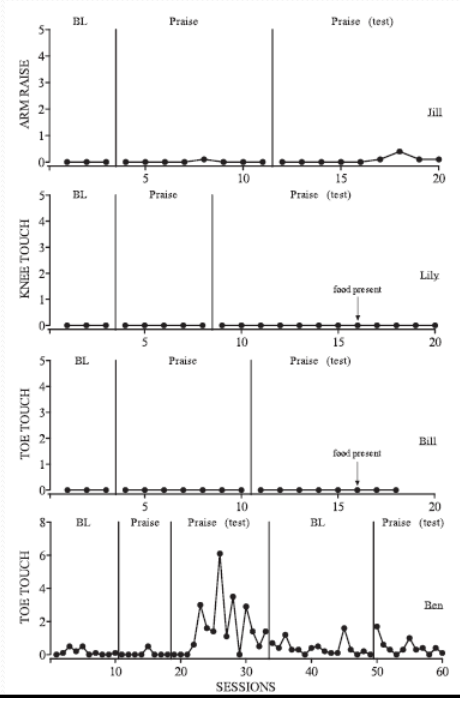
Some individuals with intellectual disabilities do not respond to praise as a reinforcer, which may limit their ability to learn. We evaluated 2 procedures (stimulus pairing and response–stimulus pairing), both of which involved pairing previously neutral praise statements with preferred edible items, to determine their usefulness in establishing praise as a reinforcer. Results of Study 1 indicated that stimulus pairing was not effective in conditioning praise as a reinforcer for 3 of 4 subjects; results were inconclusive for the 4th subject. Results of Study 2 indicated that response–stimulus pairing was effective in conditioning praise as a reinforcer for 4 of 8 subjects. After conditioning, praise also increased the occurrence of additional target responses for these 4 subjects.

Key words: conditioned reinforcement, praise, social reinforcement

Table 1
Subject Characteristics

Subject	Age (years)	Diagnosis or sensory impairments	Receptive or expressive ability
Jill	39	Severe MR, Down syndrome	1- to 2-step instructions, gestures and limited signs
Lily	47	Moderate to severe MR	1- to 2-step instructions, gestures
Bill	38	Mild MR	3- to 5-step instructions, vocal-verbal
Ben	42	Mild MR	3- to 5-step instructions, vocal-verbal
Alicia	26	Severe MR	1-step instructions, gestures
Mike	23	Severe MR	1- to 2-step instructions, gestures
Rick	56	Severe MR	1- to 2-step instructions, gestures
Riley	54	Moderate MR	3- to 5-step instructions, vocal-verbal
Larry	48	Moderate MR, seizure disorder, hearing impaired	3- to 5-step instructions, gestures and limited signs
Chris	36	Moderate MR	3- to 5-step instructions, vocal-verbal
Eric	17	Severe MR, autism	3- to 5-step instructions, gestures and limited signs
Shari	48	Moderate MR	3- to 5-step instructions, vocal-verbal

Note. MR = mental retardation.

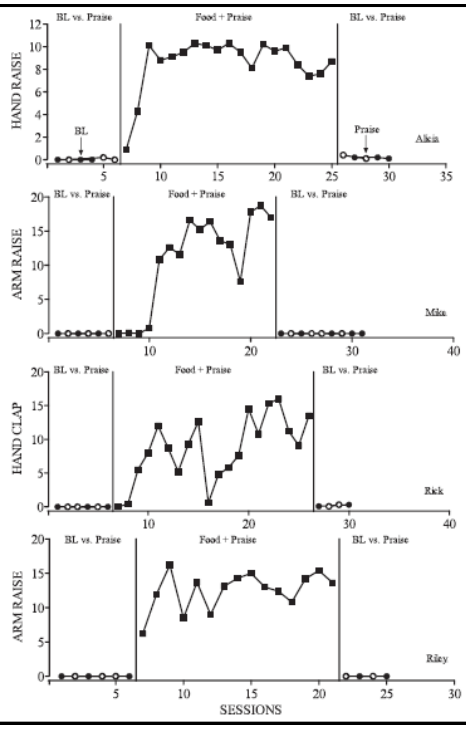


Noncontingent pairing:

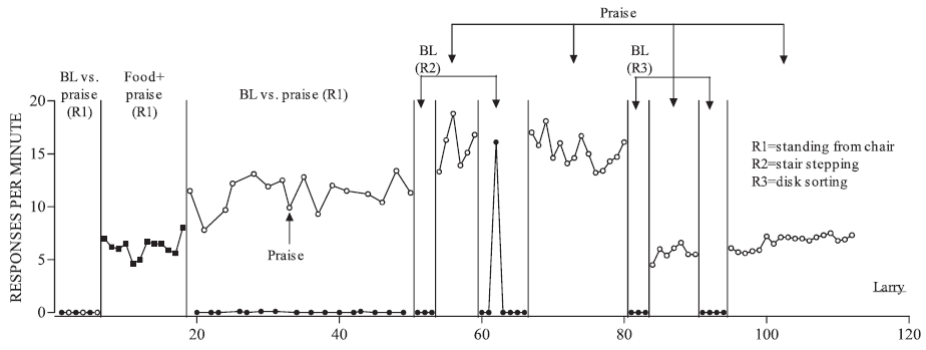
Praise (test): each session followed 5 pairing (food + praise) sessions

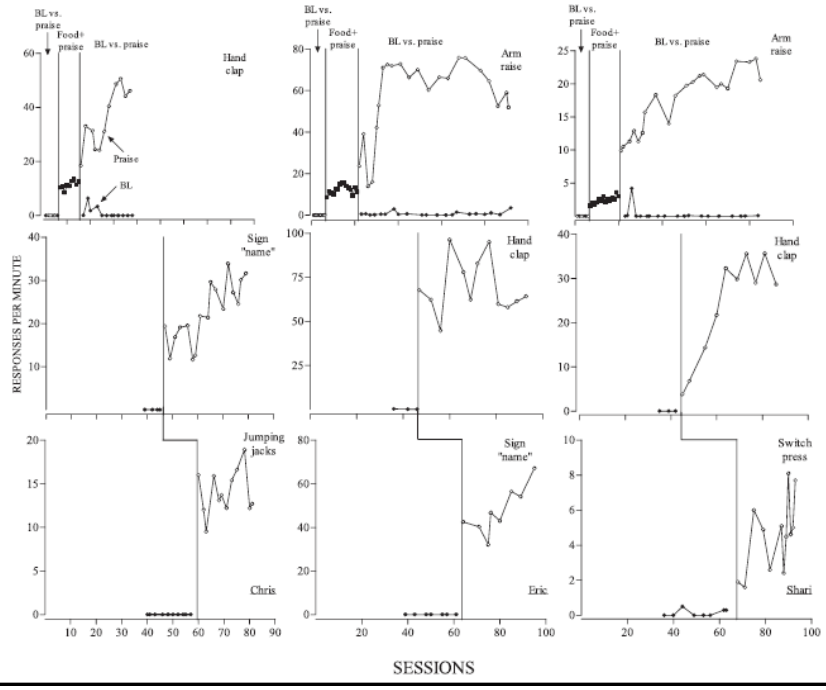
10 novel praise statements (e.g., "get on with your bad self")

Contingent Pairing



Contingent Pairing





Purpose of Axe & Laprime

Extend Dozier et al. (2012)

- Children with autism, severe delays
- Pair praise with edible and non-edible reinforcers
- Pair commonly-used praise statement: "Nice job"
- Examine time between pairing and testing sessions
- Evaluate the maintenance of pairing effects

Participants and Setting

Jack: 5-year-old male with a diagnosis of autism

- Nonverbal; stereotypy, noncompliance, rumination
- Limited reinforcers: history of satiating on tangible reinforcers such as toys and edibles; failed attempts at establishing tokens as conditioned reinforcer
- Setting: small cubby area in preschool classroom

Andrew: 9-year-old male with a diagnosis of autism

- Verbal; severe SIB, aggression, tantrums
- Tangible reinforcers necessary for compliance and skill acquisition (edibles, markers and paper, toys, movies)
- Setting: separate workspace in elementary school

Dependent Variable

Button Presses:

- Pressing down on top of button with hand and releasing
- If no release after 2 sec, hand physically prompted down
- Hand must be off button prior to next button press

Rate (presses per minute) in 1-minute sessions

IOA for Jack 35% of sessions, 93% agreement
IOA for Andrew 76% of sessions, 98.6% agreement

4 Conditions: Consequences

Conditions	Jack	Andrew
Praise	"Nice Job"	"Nice Job"
Known Reinforcer	Tickles	Edible
No Programmed Consequence	No experimenter response	No experimenter response
Pairing	Praise + Tickle	Praise + Edible

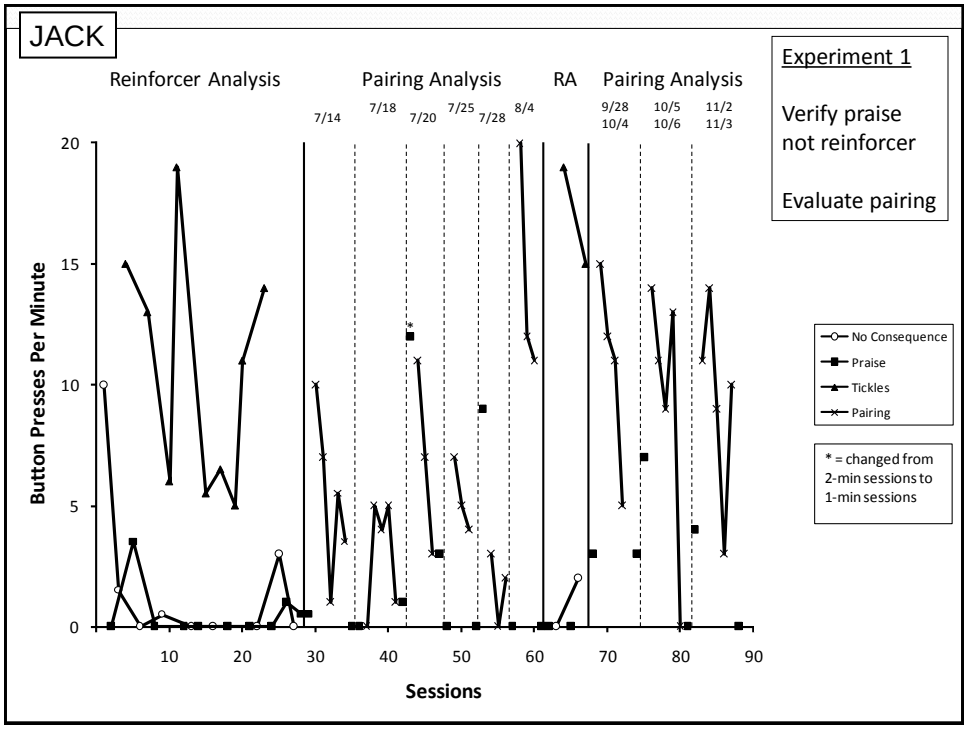
General Procedures

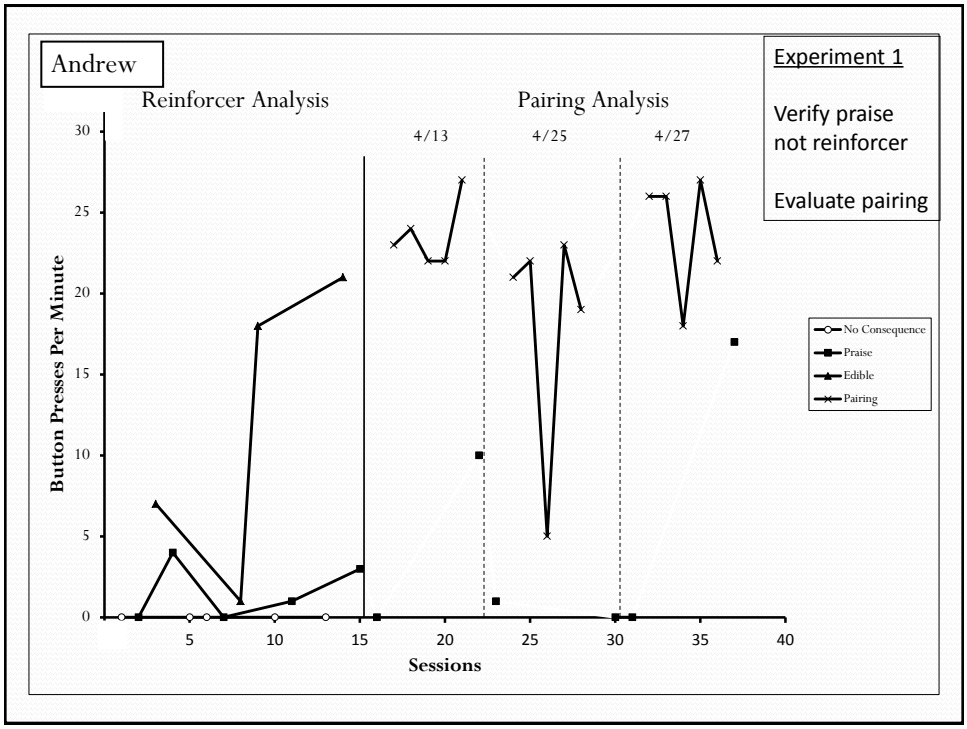
- Bring participant to chair at table
- Present button
- Physically prompt the button press 3 times and deliver the condition-specific consequence each time
- Start the timer – set for 1 minute
- When the participant presses the button, deliver consequence
- Minimum 10 minutes between sessions

Experiment 1: SR+, Pairing

1. Reinforcer Analysis (multielement design).
   VERIFY:
   - Reinforcers: tickles (Jack), potato chip (Andrew)
   - Not a reinforcer: Praise ("nice job")
   - Not a reinforcer: no programmed consequence

2. Pairing Analysis
   - Within-day analysis
   - Praise probe → 3-5 Pairings → Praise probe


JACK
Reinforcer Analysis
Pairing Analysis
RA
Pairing Analysis
7/14
7/18
7/20
7/25
7/28
8/4
9/28
10/4
10/5
10/6
11/2
11/3
Experiment 1
Verify praise not reinforcer
Evaluate pairing
Button Presses Per Minute
Sessions
No Consequence
Praise
Tickles
Pairing
* = changed from 2-min sessions to 1-min sessions


Andrew
Reinforcer Analysis
Pairing Analysis
4/13
4/25
4/27
Experiment 1
Verify praise not reinforcer
Evaluate pairing
Button Presses Per Minute
Sessions
No Consequence
Praise
Edible
Pairing

Experiment 2: Exp. Control

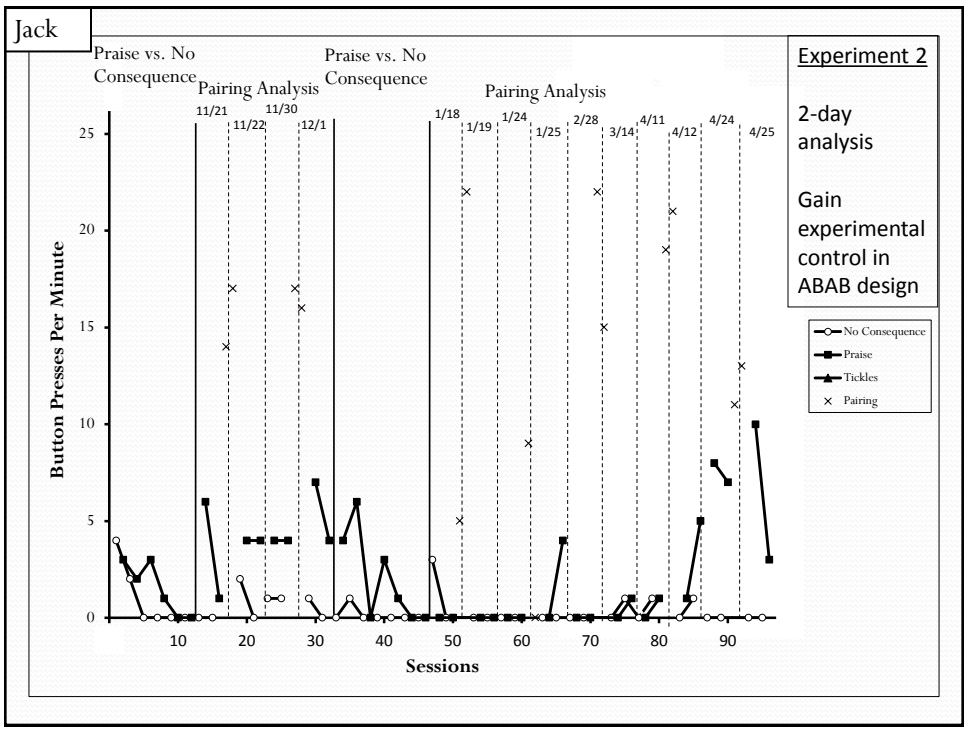
Validate experimental control:

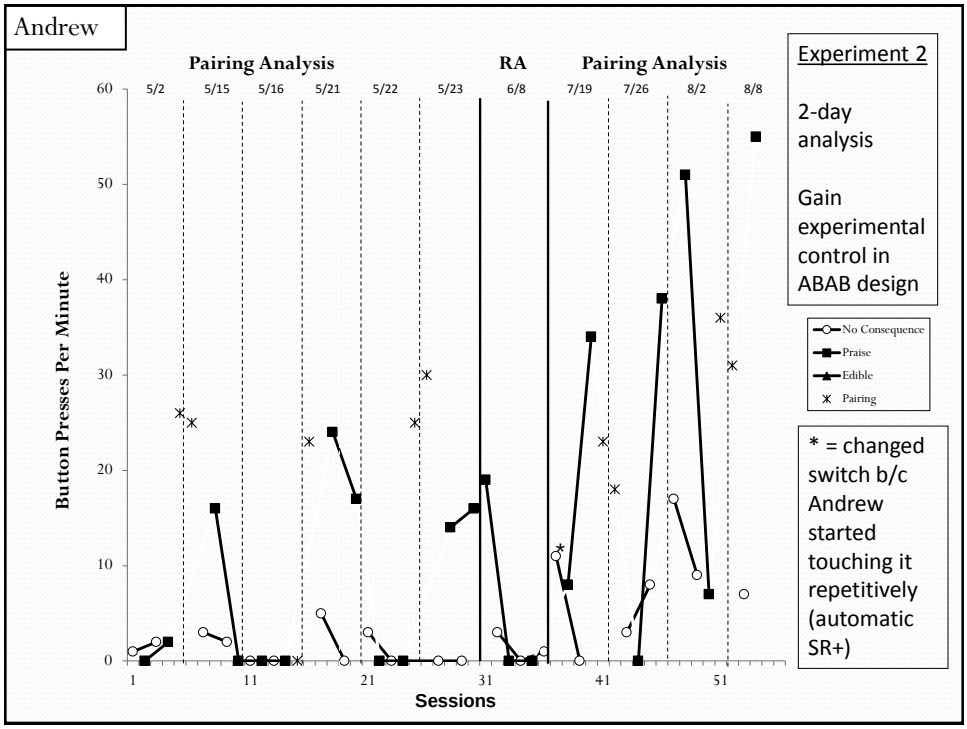
- Pairing: increased responding with praise (reversal)
- Pairing: praise > no programmed consequence (multielement)

- A condition: Praise vs. No Programmed Consequence
- B condition: 2-Day Pairing Analysis

NPC-Pr-NPC-Pr-Pairing — Day 1

Pairing-NPC-Pr-NPC-Pr — Day 2





Experiment 3: Maintenance

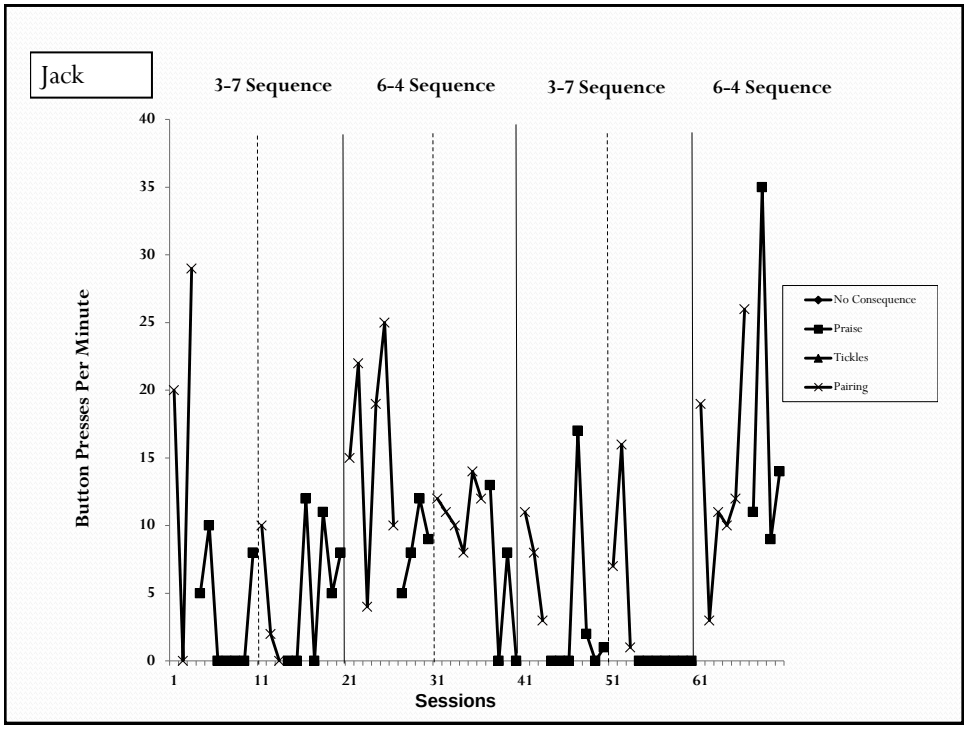
Jack only

Examine sustained effects of pairing

Compare different dosages of pairings

- 3 pairing sessions → 7 praise sessions
- 6 pairing sessions → 4 praise sessions

2-Day Analysis: 5 sessions per day across 2 days



Summary of Maintenance

	3 pairing → 7 praise	6 pairing → 4 praise
Average rate of responses across praise sessions	**2.8** (range, 0 to 17)	**10.3** (range, 0 to 35)
Percent of praise sessions with 0 responses	**64%** (18 of 28 sessions)	**17%** (2 of 12 sessions)
Percent of praise sessions with greater than 0 responses	**36%** (10 of 28 sessions)	**83%** (10 of 12 sessions)

Discussion

Contingent pairing with a known reinforcer effectively conditioned praise as a reinforcer for student behavior

Multielement within reversal design demonstrated experimental control of pairing over effectiveness of praise as a reinforcer

Time matters

- 2-day analysis: required to control conditioning effects
- Dosages sustain effects for different lengths of time

Findings → Future Research

Jack: downward trends (AO) →

- Evaluate pairing with one vs. multiple effective reinforcers
- Pairing with multiple reinforcers – generalized cond. reinforcer
- Generalized cond. reinforcer not as susceptible to satiation

Andrew: increased responding in praise condition after long break, adult may signal availability of reinforcer → Control for discriminative versus reinforcing control

Variable responding in praise condition → Evaluate amount of pairing needed for sustained effects

Future Research

- Thin schedule of reinforcer paired with praise
- Compare number of praise statements (1 vs. many) paired with known reinforcer
- Pair with one praise statement and test the effects of another praise statement
- Demonstrate effects of praise from another person
- Evaluate facial expression, tone of voice, enthusiasm

Limitations → Future Research

- Button pressing not a socially significantly response → Demonstrate strengthening of a second response with conditioned praise
- Jack: variable times, missed days, sessions in summer
- Time to consume food/receive tickles may have restricted rate of responding

Recommendations for Practice

- Program frequent pairings in educational settings
- Probe intermittently to test for praise as a reinforcer
- Test schedule of pairings needed to establish and maintain praise as a reinforcer
- Examine dosages of pairings necessary for maintenance of responding with praise
- Use intermittent pairings for maintained effects
- Consider the praise statements you use in your settings

Teaching Children with PDD-NOS to Respond to Facial Expressions using Video Modeling and Tactile Prompts



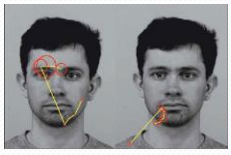

Teacher's Concerns

Social Delay	Teacher's Facial Expression	Child's Response
Perseveration on topic	"Move-along" expression and gesture	End topic
Inappropriate behaviors (e.g., nose picking, hands in pants)	"Not nice" face	Stops behavior, "that's not nice"
Rambunctious behavior, noncompliance	Disapproving look	Quiet down, comply with teacher, "I'll be good"
Tantrums	Calming expressions and gestures	"I'll calm down"

Looking at Faces and Autism

Responding to faces: observational learning, social behavior
- (Ekman, 1984)

Autism: delays
- Perceiving gaze (Ashwin et al., 2009)
- Recognizing emotions (Dyck et al., 2001; Rump et al., 2009)
- Responding to faces (Grossman & Tager-Flusberg, 2008; Klin et al., 1999)



Autism: look at mouths
- (Riby et al., 2009; Spezio et al., 2007)

fMRI – amygdala function when looking at faces
- (Ashwin et al., 2007; Kleinhans et al., 2008)

Research: Emotions, Empathy

Bernad-Ripoll (2007) – AB design

- Self-as-model videos, social stories
- Frustration, happiness, boredom, calmness, anger
- "How are you feeling?" – labeling emotions

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2009, 42, 17–32 NUMBER 1 (SPRING 2009)

TEACHING EMPATHY SKILLS TO CHILDREN WITH AUTISM

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UNIVERSITY OF NEW YORK

DAWN BUFFINGTON TOWNSEND
INSTITUTE FOR EDUCATIONAL ACHIEVEMENT

AND

CLAIRE L. POULSON
QUEENS COLLEGE AND THE GRADUATE CENTER OF THE CITY
UNIVERSITY OF NEW YORK

The purpose of this study was to teach empathetic responding to 4 children with autism. Instructors presented vignettes with dolls and puppets demonstrating various types of affect and used prompt delay, modeling, manual prompts, behavioral rehearsals, and reinforcement to teach participants to perform empathy responses. Increases in empathetic responding occurred systematically with the introduction of treatment across all participants and response categories. Furthermore, responding generalized from training to nontraining probe stimuli for all participants. Generalization occurred from dolls and puppets to actual people in a nontraining setting for 2 participants. Generalization was observed initially to the nontraining people and setting for the other participants, but responding subsequently decreased to baseline levels. Introduction of treatment in this setting produced rapid acquisition of target skills.

DESCRIPTORS: autism, empathy, social skills

Sadness/ Pain Category

Others:

Happiness/ Excitement

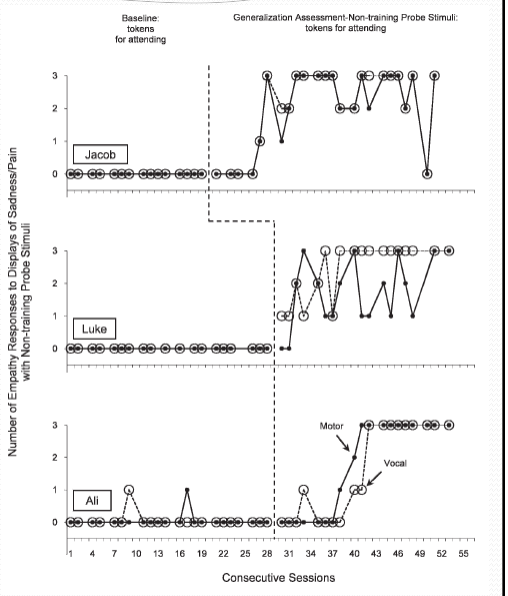
Frustration

Discriminative Stimuli	Responses
Training	"Are you okay?" and patting arm
"Ouch" and bumping leg on the table	"Are you alright?" and patting arm
"I don't feel good" and sitting down	"It's okay" and patting arm
"I hurt my elbow" and touching elbow	
"I'm so upset" and sniffling or crying	
Generalization	
"Oh no" and wiping eyes with tissue	
"I have a headache" and holding forehead	

Taught with dolls and puppets

Prompt delay, modeling, rehearsals, reinforcement

Generalization to people



Video Modeling

Adult or child demonstrates desired behaviors

Show right before expectation to demonstrate skills

Kids like videos: strong reinforcers, discriminative stimuli

Once prepared, efficient method of instruction

Video Modeling

- **Toilet training** (Lee et al., 2014)
- **Multicomponent tasks** (Mechling et al., 2014)
- **Role-playing skills** (Akmanoglu et al., 2014)
- **Social responses** (Jones et al., 2014)
- **Compliments** (Macpherson et al., 2014)
- **Social-communicative initiations** (Cihak et al., 2012; Grosberg & Charlop, 2014)
- **Imitation** (Cardon, 2013; Cardon & Wilcox, 2011; Kleeberger & Mirenda, 2010; Tereshko et al., 2010)
- **Sorting mail** (Alexander et al., 2013)

Video Modeling

- **Play** (Boudreau & D'Entremont, 2010; Dupere et al., 2013; Lyden et al., 2011; MacDonald et al., 2009; Ozen et al., 2012; Sancho et al., 2010; Scheflen et al., 2012)
- **A series of novel skills** (Taber-Doughty et al., 2013)
- **Self-help skills** (Shrestha et al., 2013)
- **Functional skills** (Smith et al., 2013)
- **Greetings** (Kagohara et al., 2013)
- **First aid skills** (Ozkan, 2013)
- **Vocational tasks** (Allen et al., 2010; Kellems & Morningstar, 2012; Van Laarhoven et al., 2012)

Video Modeling

- **Communicative socials skills of college students with Aspergers** (Mason et al., 2012)
- **Cooking** (Mechling et al., 2009; Taber-Doughty et al., 2011)
- **Verbal repertoires** (Plavnick & Ferreri, 2011; Marcus & Wilder, 2009)
- **Transitions** (Cihak, 2011; Cihak et al., 2010; Cihak & Ayres, 2010)
- **iPod use** (Hammond et al., 2010)
- **Play video games** (Blum-Dimaya et al., 2010)
- **Social skills** (Charlop et al., 2010; Tetreault et al., 2010)

Purpose of Axe & Evans (2012)

Use video modeling to teach children with PDD-NOS to respond to facial expressions

Participants and Setting

Three children with PDD-NOS, age 5

- Hank, Bill, Ken

Verbal, rigid with routines, easily frustrated, working on using age-appropriate social skills

Public early childhood center in a suburban district

Self-contained classroom; typical classroom

2 - 3 sessions per week, 10 min per session

Facial Expressions	Teacher's Behavior	Child's Response
Approval	Wink	"I did good"
Bored	Hand on cheek, drowsy eyes	"You look bored"
Calming	Inhale, exhale, hands down	"I'll calm down"
Disgusted	Squinted mouth and eyes, shaking head	"That's not nice"
Impatient	Gesturing hand, eyes wide open	"Ok, ok, I'm done"
Pain	Squinted eyes, rubbing forehead	"Are you ok?"
Pleased	Nodding head, ends of mouth down	"I did good"
Disapproval	Arms crossed, head down	"I'll be good"

We Prepared Two Sets of Videos

Facial expressions alone – probe

Facial expressions with modeled responses – training (video models)

Experimental Design, Procedures

Multiple probe across facial expressions design

Probe at start of each session (mean IOA 94%)

- Facial expressions alone – "What do you say?"
- Correct responses → praise and pat on back
- If correct, no training
- If incorrect → training

Generalization Probes

Hank

- Teacher in cubby
- Researcher in cubby
- Teacher in typical classroom
- Aide in typical classroom
- Typical peers in classroom

Bill

- Teacher in cubby
- Teacher in classroom

Ken

- Teacher in empty room
- Aide in classroom

Teaching Steps

Showed video of adult making facial expressions and another adult responding

↓

Asked student to repeat response

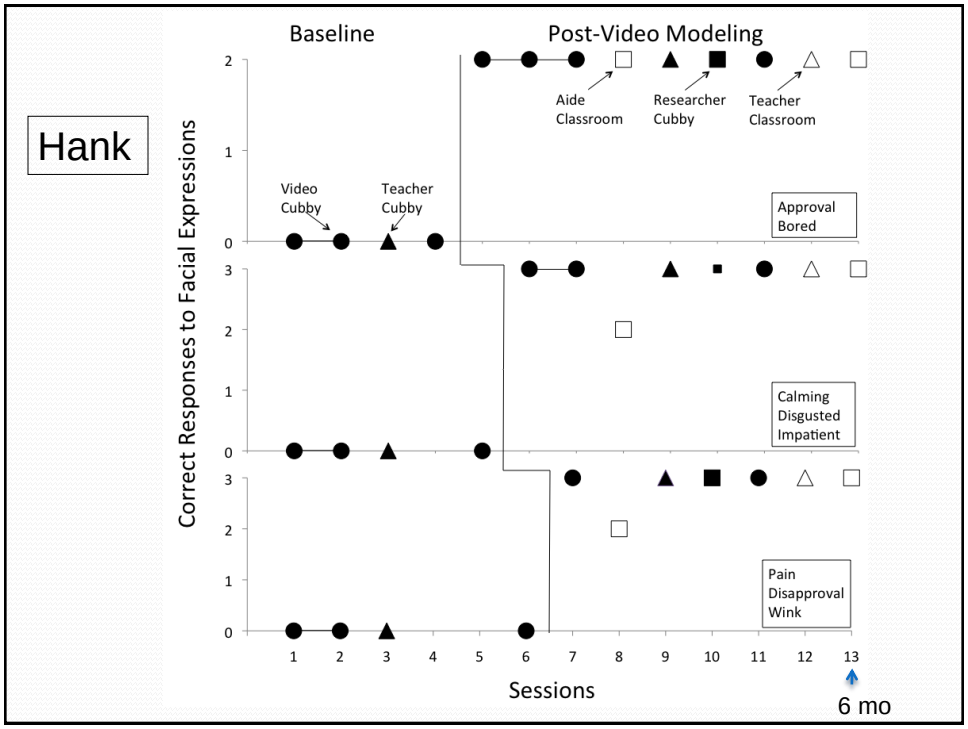
↓

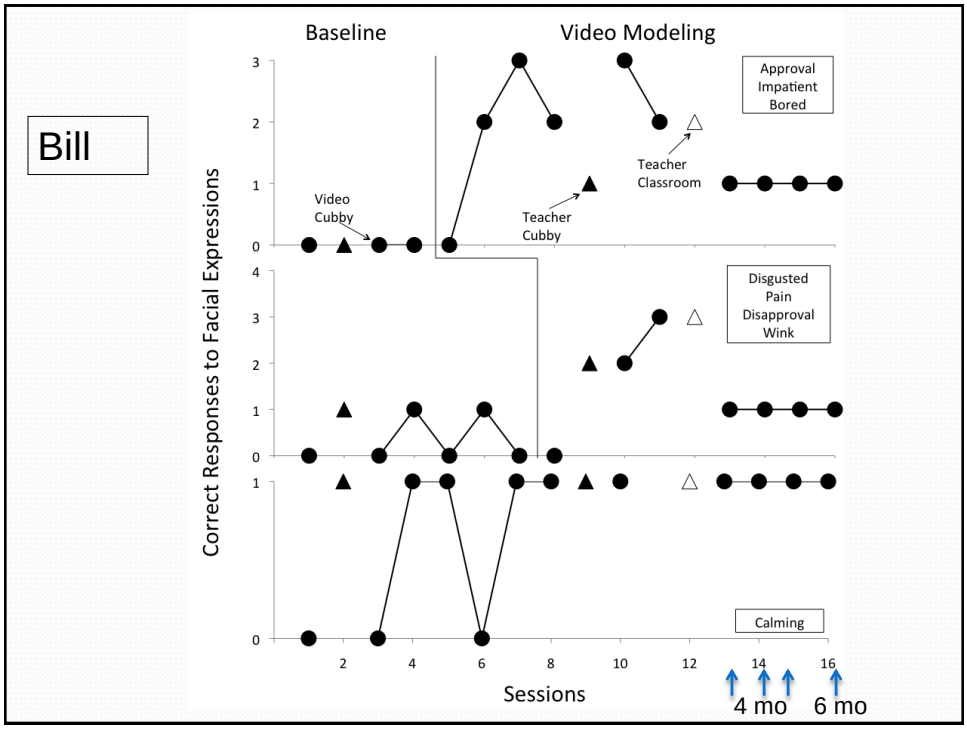
Showed video of facial expression and asked, "What do you say?"

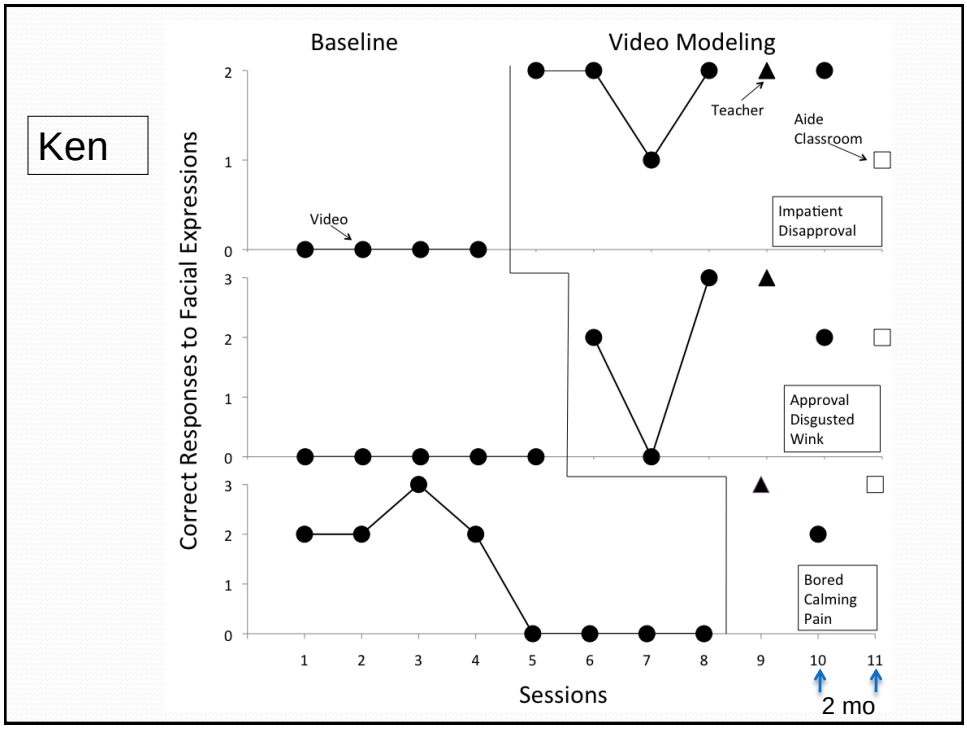
↓ If correct

Praise

If incorrect → Showed video of adult making facial expressions and another adult responding




Bill
Baseline
Video Modeling
Approval
Impatient
Bored
Teacher
Classroom
Video
Cubby
Teacher
Cubby
Disgusted
Pain
Disapproval
Wink
Calming
Correct Responses to Facial Expressions
Sessions
4 mo
6 mo


Ken
Baseline
Video Modeling
Teacher
Aide
Classroom
Video
Impatient
Disapproval
Approval
Disgusted
Wink
Bored
Calming
Pain
Correct Responses to Facial Expressions
Sessions
2 mo

Conclusions

Video modeling effective in teaching three children with autism to respond to facial expressions

Generalization across people and settings

Adds to research on applications of video modeling

Adds to research on facial expressions – applied

Strength: one-trial learning for Hank

Limitation: inconsistent responding by Bill

Next Steps

So far, contrived situations – all faces presented in a row

Target real-life situations, such as conversations

Next Steps

What is the first behavior a child must emit to respond to the teacher's facial expression?

- Look at the teacher

Respond to faces in more natural situations

- Interactive play with games/toys
- Conversations

EDUCATION AND TREATMENT OF CHILDREN Vol. 36, No. 2, 2013

Teaching Eye Contact to Children with Autism: A Conceptual Analysis and Single Case Study

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Carbone Clinic

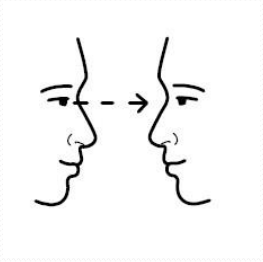
Abstract

Eye contact occurs very early in development and serves many functions for the young child. It has been implicated in the development of social, cognitive, and language skills. A substantial number of children with autism fail to develop this important skill and therefore experimenters with both developmental and behavior analytic perspectives have researched methods to teach eye contact. However, only a few researchers have recently attempted to condition the response of the communication partner as a reinforcer for social behavior and thereby arrange the conditions under which typical children develop social responses. The purpose of this case study was to extend the analysis of typical development of social skills to the teaching of eye contact as a language pragmatic skill to a child with autism. Data from a single case study of a child with autism are provided.

Carbone et al: Eye Contact

Eye contact is critical for:

- Joint attention
- Learning language
- Learning from an instructor



Previous research:

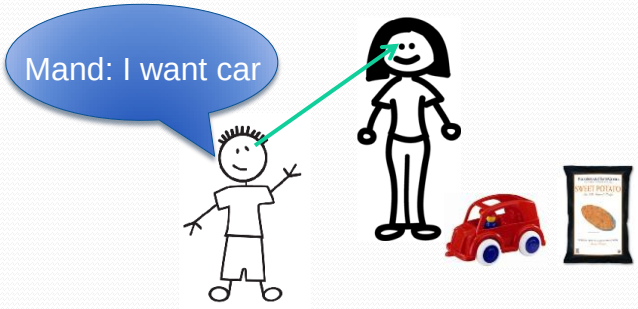
- Early research: physical and vocal prompts
- Recent research: naturalistic training, peer modeling
- Limitation: tangible, edible, praise as reinforcers

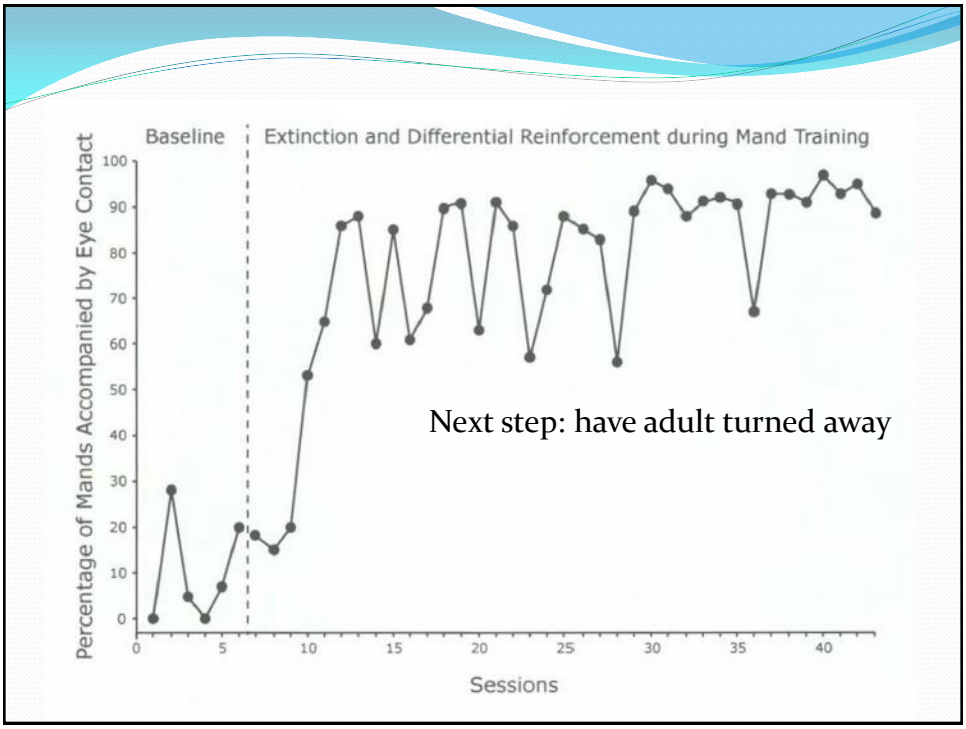
Carbone et al. (2013)

Baseline: mand → deliver reinforcer

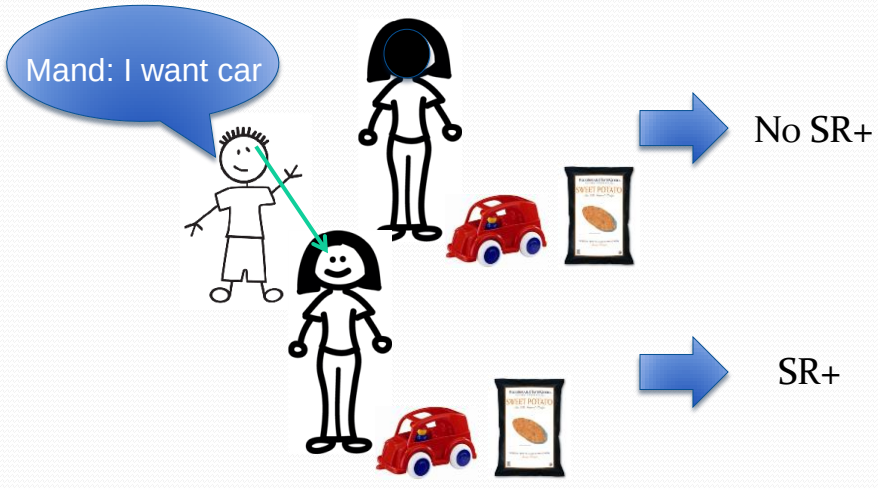
Treatment: Extinction-induced variability

mand → extinction until eye contact

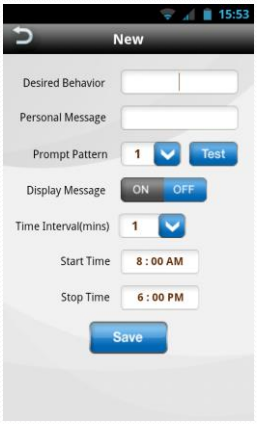




Carbone et al. – Next Steps



MotivAider



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Research – Tactile/Pager Prompt

- Social initiations: "When you feel prompt, go to friend"
  - Taylor & Levin (1998)
  - Shabani et al. (2002)
  - Tzanakaki et al. (2014)
- Increase on-task behavior (Moore et al., 2013)
- Reducing rapid eating (Anglesea et al., 2008)
- Staff training (Mowery et al., 2010)

Purpose of Axe & Evans (in prep)

Use MotivAider to prompt eye contact and increase responding to facial expressions

Eye contact: anytime the student's eyes are not looking at the adult's eyes and then look at adult's eyes

Method

Large table in classroom

- Conversation: 4 minutes
- Game: 4 minutes

0:00 – 0:30	Play normally
0:30 – 1:00	Approval
1:00 – 1:30	Play normally
1:30 – 2:00	Sad
2:00 – 2:30	Play normally
2:30 – 3:00	Happy
3:00 – 3:30	Play normally
3:30 – 4:00	Bored

Baseline: no MotivAider

Intervention: child wore MotivAider set for 30 sec

- Explained to child purpose of MotivAider
- Reviewed responses to four facial expressions
- Eye contact → praise
- Respond to facial expression → social response

Changing the Interval

Can change the interval of the MotivAider

Participants not responding as much as we wanted

We changed the interval from 30 to 15 seconds

Another change for Ken

We observed that when I made a facial expression, Ken looked up at me and responded

We changed my intervals to 15 seconds

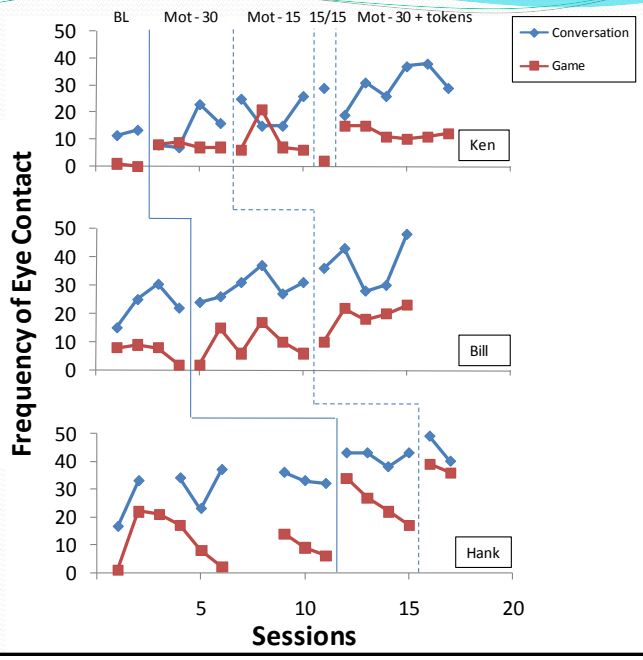
So both the experimenter's and participant's MotivAiders were set for 15 seconds

Reward System

Ken, even at 15 second intervals, was not responding as much as we wanted

Token system

- When he looked at the instructor he received a stamp
- If he received more stamps than in the previous session, he earned a preferred item (chocolate, game, sensory activity)



Responding to Facial Expressions

Video modeling was effective in teaching 3 children with PDD-NOS to respond to 8 facial expressions

MotivAiders were effective in increasing eye contact during play and conversation – necessary for responding to facial expressions

Learning to respond to subtle facial cues is critical for succeeding with teachers and making and retaining friends

Future Research

Responding to facial expressions in more natural settings

- More research on responding to peers' faces
- Teach verbal AND motor response
- What's the reinforcer? Teach peers to reinforce responses
- How fade MotivAider? Need natural cue in the natural environment

Generalization

- Stimulus generalization: people make facial expressions different – multiple exemplar training
- Response generalization: different ways to respond to a facial expression

Applications: Video Modeling

Video modeling to teach a variety of skills

- Conversations, social play skills, daily living skills

Kids like videos

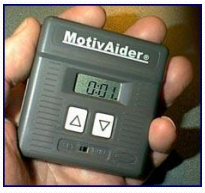
Once videos are prepared, use across days, settings, and students

Cost-effectives – lest costly than therapist modeling

Applications: MotivAiders

Target skills

- Increase eye contact and responding to faces
- Increase social initiations and responses to peers
- Increase hand raising in class
- Self-management



Non-stigmatizing

- Child can have in pocket
- Less teacher prompting

Fading: interval and sensation; might need reward system

IN CONCLUSION

Recent Research on Social Skills

Social Skills

- Playing games
- Pretend play
- Sharing
- Manding to peers
- Social initiations
- Social responses
- Responding to faces
- Making eye contact

Teaching Strategies

Less adult assistance

- Picture Activity Schedules
- Video Modeling
- Script Training and Fading
- Tactile Prompts

More adult assistance

- Teaching Interaction Procedure
- Social Stories

Diagnostic Criteria for ASD (DSM-5)

Deficits in social-emotional reciprocity

- Failure of back-and-forth **conversation**
- Failure to **initiate or respond to social interactions**

Deficits in nonverbal communication

- Abnormalities in **eye contact** and **body language**
- Deficits in understanding and using **gestures**
- Lack of **facial expressions** and nonverbal communication

Deficits in developing and maintaining relationships

- Difficulty adjusting to social contexts
- Difficulty **sharing imaginative play** or **making friends**
- Absence of interest in peers

Praise/Attention as a Reinforcer

Social behaviors are maintained by social interactions

All verbal operants (ex. mand) maintained by attention

Praise is commonly used in general education

Contingent pairing of praise and reinforcer

For all children with autism? We must try.

Programming for Generalization

Prompting, prompt fading, positive reinforcement

- They work

We need to get beyond using those tactics alone to simply increase social behaviors

Must analyze all variables influencing behavior for typical children, in the natural environment

Must teach in the context of those variables: must make teaching setting like generalization setting

Generalization: Examples

Teaching Setting	Natural Setting	Generalization?
Saying "hi" sitting in chairs	Saying "hi" approaching in the hallway	Don't expect generalization
Edibles for turn taking	No edibles – continued game play is reinforcer	Don't expect generalization
Adult praise when manding to peers	No adult praise when manding to peers	Don't expect generalization
Motivaider cuing eye contact	Motivaider cuing eye contact	Increase likelihood of generalization

The Thing About Research

Studies answers small research questions

Practitioners need to combine research findings

Practitioners must teach skills throughout the day

Thank you for your attention!

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