Simple and Conditional Discrimination

Discrimination

- Basic two-term analytic unit (R-SR+)

- Discriminated Operant (S: R-SR+)

- Response class produced by differential reinforcement with respect to stimulus properties

Discrimination examples

- Traffic light
- "out of order" sign
- Naming people, objects, etc.
- More complex discriminations present in the verbal episode (peoples' facial expressions, context, audience, etc.)

SD and S-Delta

- **Discriminative stimulus (S^D) -** a controlling stimulus that sets the occasion for reinforcement of an operant.
- **S-delta (S^Δ)or extinction stimulus**- a stimulus that sets the occasion for nonreinforcement or extinction of an operant

SD and S-delta

- SD
  - (1) alters the current frequency of a type of response
  - (2) because of a historical relation between the presence/absence of that stimulus and the <u>differential availability</u> of an effective reinforcer.

Discrimination Training

- SD <u>present</u>
  - R must be followed by an effective reinforcer.
- SD <u>absent</u> (the S∆ condition)
  - R must not be followed by an effective reinforcer (Ext)
- The mere presence of an antecedent stimulus/context during reinforcement in not a sufficient condition for the establishment of stimulus control

Discrimination Training

- When we respond in one situation but not in another, we say that we show discrimination, or that we discriminate
- E.g., child misbehaves in the presence one parent but no the other

Outcome of discrimination

- SD $\rightarrow$?

- S-Delta $\rightarrow$

- <u>Stimulus control</u> – Change in behavior when S is present/absent

ASR #1

- What makes up the 2 term analytic unit?

  1. A response and consequence

  2. An antecedent and a response

  3. An antecedent and a reinforce

  4. Two responses

ASR #2

- Which of the following statements is true?
  1. All operant behavior is under discriminative control.
  2. Past reinforcement influences responding.
  3. Specific stimulus characteristics influence responding.
  4. All of the answer choices are correct.

ASR # 3

- Discrimination training consists of:
  1. Delivering reinforcement in the presence of an S^D and delivering punishment in the presence of an S^{DP}.
  2. Delivering reinforcement in the presence of an S^D and withholding reinforcement in the presence of an S^A.
  3. Only delivering reinforcement in the presence of an S^D.
  4. Answer choices 1 and 2 are correct.

ASR # 4

- Which of the following is true of the Skinner box example?
  1. When a rat is only exposed to receiving reinforcement for lever presses in the presence of a light, the light becoming an S^D.
  2. Turning the light back on while the rat is lever pressing may reinforce lever pressing in the dark.
  3. A rat that is only exposed to receiving reinforcement for lever presses in the presence of a light will stop lever pressing in the dark.
  4. All of the answer choices are correct.

Evoked Vs. Emitted

- Operants can and do occur in the absence of any obvious stimulus, they are said to be freely <u>emitted.</u>
- However, when an S^D comes to control occurrences of an operant, to alter its probability of occurring, then it is said that the S^D <u>evokes</u> the operant. The term evoke dictates that the operant is under the stimulus control of an antecedent stimulus

Discriminative Vs Motivative

- Discriminative variables → related to availability of a certain consequence

  - Parent → cries → gets food
  - No parent → cries → gets no food

Discriminative Vs Motivative

- Motivative/Motivating Variables → related to effectiveness of a certain consequence as a reinforcer

  - No food ("hungry") → cries → gets food
  - Food ("not hungry") → cries → gets food

Discriminative and Motivative

Discrimination training would only work if MO is present

- No Food (EO) → Parent (SD) → cries (R) → food (SR+)

- No Food (EO) → No parent (S$_\Delta$) → cries (R) → no food (SR+)

Discriminative and Motivative

- Stimulus control is only seen if MO is present

  – How can you demonstrate stimulus control?
    - Present the SD
    - Would it work?

Generalization

- Response occurs in novel stimulus situation due to similarity to original stimulus (SD)
- Any change in original stimulus would decrease evocative effect.

Generalization

- While discrimination refers to precise control of an operant by a stimulus, generalization involves less precision

- Can you think of examples in which generalization is desired?

- How about not desired?

ASR # 5

•Which of the following statements is true?

1. Discrimination is an active process.
2. Individuals discriminate.
3. The environment produces discrimination.
4. All of the statements are correct.

ASR # 6

- Stimulus control occurs when:
    1. Changes in behavior are a function of antecedent stimuli.
    2. Responding occurs in the presence of antecedent stimuli due to its correlation with a higher probability of reinforcement in the past.
    3. The environment produces discrimination.
    4. All of the statements are correct.

ASR # 7

- A response is emitted when:
    1. It occurs in the presence of a specific stimulus.
    2. It occurs in the absence of a specific stimulus.
    3. It is under stimulus control.
    4. Its probability of occurring is greater when an S^D is present.

ASR # 8

- Which of the following terms can be correctly used across all behavioral relations?
    1. Elicit
    2. Emit
    3. Evoke
    4. All of the terms can be correctly used across all behavior relations.

ASR # 9

•What is the most important component of discrimination training?

1. The use of a valuable reinforcer
2. The presence of a salient S^D
3. The presence of an S^Δ
4. The learner's response

ASR # 10

- In reference to generalization:
  1. The individual generalizes.
  2. The individual's environment promotes generalization.
  3. It involves precise control.
  4. It occurs naturally and does not have to be taught.

Generalization

- While discrimination refers to precise control of an operant by a stimulus, generalization involves less precision

- Can you think of examples in which generalization is desired?

- How about not desired?

Generalization

- Process by which stimuli get "recruited" into new classes
- Stimuli may become part of a class due to generalization

Successive Vs Simultaneous

- Successive → Presentation of SD and S-Delta follows one another (Multiple-schedule)
  - E.g., Topographically different responses (repeat 'd' or 'b')
- Simultaneous → SD and S-delta are presented at the same time.

Teaching Procedures

Trial and Error
- Incorrect responses end a trial or produce some relevant stimulus that may be associated with a longer ITI (time-out)
- Correction procedure
  - What is the function of the correction procedure?

Teaching Procedures

- Errorless discrimination
  - Involves gradually introducing the S^Δ initially at a very weak intensity such that is little opportunity to respond to it.
  - Over repeated trials, the intensity of the S^Δ is gradually increased. Eventually the S^Δ can be presented in its full intensity and the subject will not respond to it.

Errorless Discrimination Learning

- Terrace (1963)
  - Red – Green discrimination
  - Early-progressive, early constant, late-progressive, late constant
  - Vertical-horizontal discrimination
  - Superimposition and fading
  - Superimposition only, abrupt, vertical-horizontal

ASR # 11

- What is meant by "stimuli get recruited into new classes"?
  1. A novel stimulus shares similar properties with known stimuli, which in turn evokes the same responses as the know stimuli.
  2. Generalization occurs.
  3. The stimulus class brings in the novel stimulus.
  4. 1 and 2, but not 3

ASR # 12

- The S^D and S-Delta presented at the same time represents:
  1. Successive discrimination
  2. Simultaneous discrimination
  3. Mixed schedule discrimination
  4. Multiple schedule discrimination

ASR # 13

- During successive discrimination, presentation of the S^D and S-Delta:
  1. Occur at the same time.
  2. Occur one after the other.
  3. Target the same response.
  4. Are implemented under a mixed schedule.
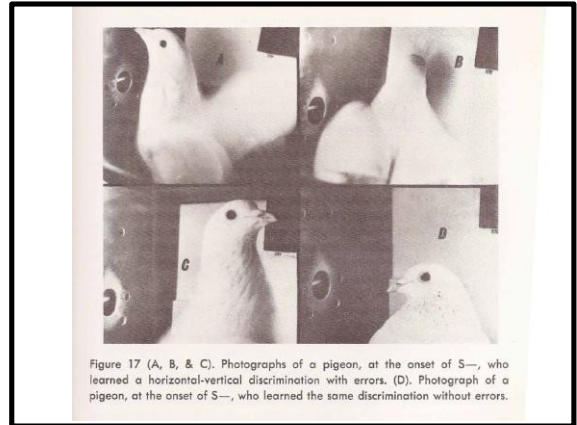
ASR # 14

- Which of the following statements is true?
  1. Errorless teaching procedures assume that errors are not necessary in learning.
  2. Trial and error teaching procedures assume that errors inhibit learning.
  3. When errors are made the learner is to blame.
  4. Errorless teaching includes error correction procedures.

ASR # 15

- Procedures used by Terrace in 1963 included all of the following <u>except</u>:
  1. Fading
  2. Prompting
  3. Response cost
  4. Time out

---- End of video 1 ----

Errorless Discrimination Learning

- Terrace (1963)
  - Red – Green discrimination
  - Early-progressive, early constant, late-progressive, late constant
  - Vertical-horizontal discrimination
  - Superimposition and fading
  - Superimposition only, abrupt, vertical-horizontal

Figure 17 (A, B, & C). Photographs of a pigeon, at the onset of S—, who learned a horizontal-vertical discrimination with errors. (D). Photograph of a pigeon, at the onset of S—, who learned the same discrimination without errors.

Simple Discrimination

NVSD   VB

"CIRCLE"

"SQUARE"

ASR # 16

- In the first study by Terrace in 1963:
  1. The early constant schedule resulted in the least amount of errors.
  2. The early progressive schedule resulted in the least amount of errors.
  3. The late progressive schedule resulted in the least amount of errors.
  4. The late constant schedule resulted in the least amount of errors.

ASR # 17

- Which of the following methods resulted in the least amount of errors in the second Terrace study in 1963?
  1. Superimposition only
  2. Superimposition and fading
  3. No imposition
  4. Discrimination did not occur because pigeons do not have the biological capacity to detect lines.
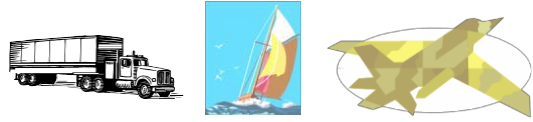
Simple Discrimination

NVSD

VB

"CIRCLE"

"SQUARE"

Conditional Discrimination

VBSD   NVSD   NVB

"CIRCLE" ———   ——— POINT

"SQUARE" ———   ——— POINT
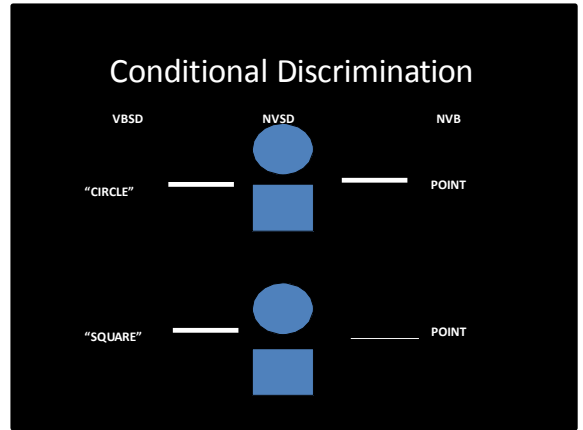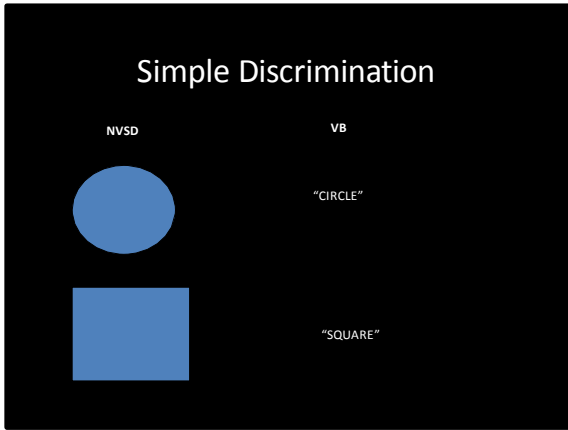
Conditional Discrimination

- Matching to sample
  - Learning, memory, categorization, and concept formation
- A trial begins with a the presentation of a sample stimulus
- A response to the sample produces the comparisons (choice keys)
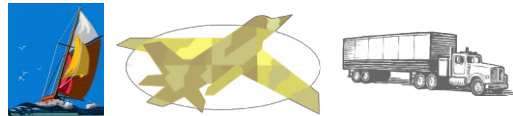- Sample present until a choice is made

Avião
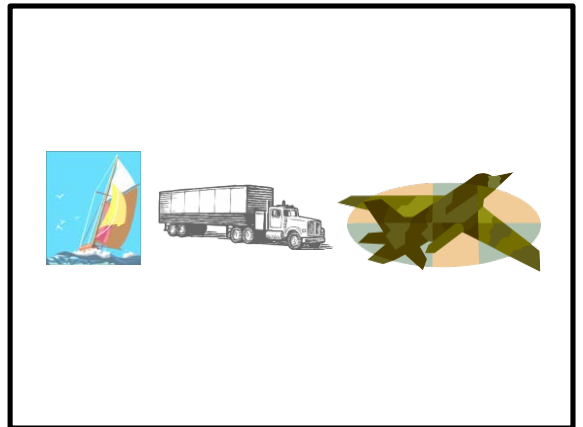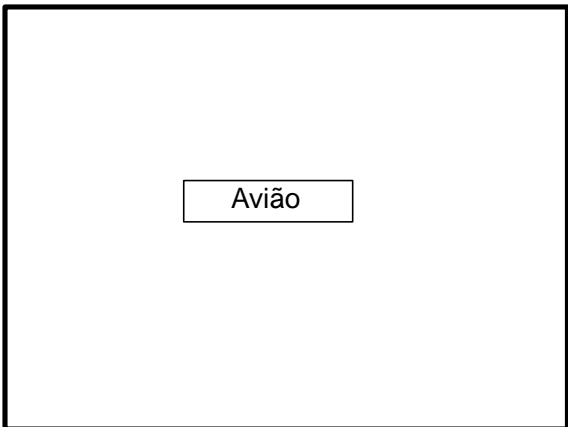
Caminhão

Barco

Conditional Discrimination

- Visual-Visual Vs. Auditory-Visual Matching
- Identity, Oddity, Symbolic or Arbitrary Matching
- Typically three choices/comparisons
- Two choices also common, but there are some limitations
  - What are they?

ASR # 18

- In the match to sample example of conditional discrimination, the evocative effect of the present stimuli on responding is dependent on:
  1. The stimuli present.
  2. The response.
  3. What was said.
  4. How many stimuli are present.

ASR # 19

- During simultaneous matching, the sample:
  1. Is present for a short period of time.
  2. Is always present.
  3. Remains present until the organism responds.
  4. Is presented after the organism responds.

ASR # 20

- Which of the following represents an auditory-visual conditional discrimination?
  1. The sample is the word "ball" and the S^D is the word "ball".
  2. The sample is a picture of a ball and the S^D is an actual ball.
  3. The sample is an actual ball and the S^D is a picture of a ball.
  4. The sample is the word "ball" and the S^D is an actual ball.

ASR # 21

- What is a potential problem of teaching match-to-sample using only 2 stimuli?
  1. The learner might not learn to accurately discriminate.
  2. Targeting as many stimuli as possible results in faster learning.
  3. The learner may be capable of more challenging activities.
  4. All of the answer choices are correct.

Conditional Discrimination

- When using MTS to teach conditional discriminations
  - Number of comparisons is important
  - Sequence of trials is important
  - Location of comparisons/randomization
    - Can we leave it to the teacher?

Conditional Discrimination

- Important Feature absent from ABA procedures
- Observing response
- Response to sample, produces comparisons
  - Differential sample responses (FR-DRL)
  - Naming the sample
  - Repeating the sample

Conditional Discrimination

- Not successfully acquired via trial and error
- Successive discrimination of samples + simultaneous discrimination of comparisons
- How to guarantee these discriminations
  - Differential Sample Responses
  - Stimulus shaping
  - Prompt/fading
  - Go/No-go

ASR # 22

- Which of the following is NOT an example of arbitrary matching?
    1. The sample is a picture of a shoe and the S^D is the written word shoe.
    2. The sample is the spoken word "cat" and the S^D is the written word cat.
    3. The sample is the written word chair and the S^D is written word chair.
    4. The sample is a car and the S^D is a picture of a car.

ASR # 23

- Which of the following is recommended when teaching discrimination?
    1. Shuffle the stimuli between trials.
    2. Use 10 block trials.
    3. Collect data on the first trial, to minimize session disruptions.
    4. The number of trials should be a multiple of the number of target stimuli.

ASR # 24

- Which of the following is a reason to collect data for every trial?
    1. Data may serve as a therapist's prompt.
    2. The data can aid in error analysis.
    3. Analysis of the data may detect patterns in responding.
    4. All of the answer choices are correct.

ASR # 25

- Which of the following is true of the observing response?
    1. The reinforcer of both the observing response and the S^D are the same.
    2. Its function is to guarantee attending.
    3. Conditional discriminations will not occur without the observing response.
    4. Answer choices 2 and 3 are correct.

Conditional Discrimination

- Not successfully acquired via trial and error
- Successive discrimination of samples + simultaneous discrimination of comparisons
- How to guarantee these discriminations
    1. Differential Sample Responses
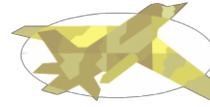   2. Stimulus shaping
    3. Prompt/fading
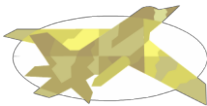   4. Go/No-go

Go/No-Go

Barco

Go/No-Go

Barco

Avião

Avião

Conditional Discrimination

• Teaching one sample and one comparison at a time
– May be establishing simple rather than conditional discrimination
– History with simple may hinder conditional disc.
• Using distracters
– Same as above. History of reinforcement in the presence of "old" stimulus may prevent selection of novel stimulus
– No need to attend to the sample

Barco

Barco

Barco

Important features

- Simple discrimination?
- Effective reinforcers?
- Observing response?
  - Repeat or name the sample
  - Differential responses
- Errorless procedures?
  - Prompt/Fading, Stimulus shaping, exclusion
- Randomized trials?
- Differential outcomes?

ASR # 26

- Which of the following is necessary for conditional discrimination?
  1. Successive discrimination
  2. Simultaneous discrimination
  3. Simple discrimination
  4. All of the above

ASR # 27

- What is the purpose of the ABLA?
  1. It assesses the ability of individuals to make simple discriminations.
  2. It assesses an individual's language abilities.
  3. It provides a curriculum for teaching discriminations.
  4. It provides guidance for where to start when teaching conditional discriminations.

ASR # 28

- ABLA is short for:
  1. Assessment of beginning learner's abilities
  2. Assessment of basic learning abilities
  3. Assessment of beginner's language abilities
  4. Applied behavior and language assessment

ASR # 29

- Which of the following procedures do NOT aid in teaching discrimination?
    1. Go/ No-go
    2. Stimulus shaping
    3. Prompt/ fading
    4. Trial and Error

ASR # 30

- Which of the following statements is correct regarding teaching one sample at a time?
    1. Teaching one sample is not recommended because the learner does not have to attend to respond.
    2. Teaching one sample is recommended because the learner will make less errors.
    3. Teaching one sample is recommended because responses toward the S^D become strong.
    4. Teaching one sample is not recommended because the learner is unlikely to learn from mistakes.

ASR # 31

- Using distracters:
    1. Is recommended because the learner has to attend to both stimuli.
    2. Is not recommended because the learner's history has already identified the target stimuli as the S^D.
    3. Is recommended because the position of stimuli may be altered.
    4. Is not recommended because the learner may make errors.

ASR # 32

- Which of the following is the most important feature of teaching conditional discriminations?
    1. Attending
    2. Effective reinforcers
    3. Errorless procedures
    4. Randomized trials

---- End of video 2 ----

Conditional Discrimination

- Data collection for EVERY trial is crucial
- Allows you to counterbalance sample and comparison presentations
- Allows you to analyze error patterns
- Don't let them fool you with this one trial probe session. NOT FOR DISCRIMINATION

Conditional Discrimination

SC1:
$$SD1 \rightarrow R1 \rightarrow SR1$$
$$SD2 \rightarrow R1 \rightarrow EXT$$

SC2:
$$SD1 \rightarrow R1 \rightarrow EXT$$
$$SD2 \rightarrow R1 \rightarrow SR1$$

Equivalence

- One of the outcomes of MTS is substitutability between sample and comparisons
- Substitutability = Symbolism
- One stimulus would stand for the other

Equivalence

➢ After learning to relate pictures of different toys in a matching to sample task, humans may be able to match these pictures with one another

➢ Also, if learning to relate a picture of a dog to the spoken word "dog", and the printed word DOG to the same spoken word, humans may relate the picture to the printed word and vice-versa
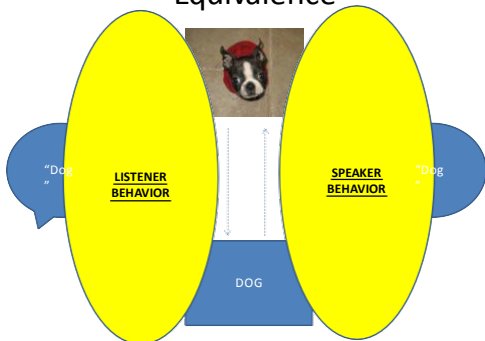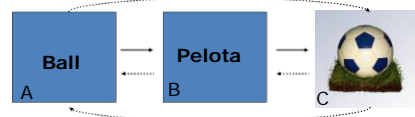
Equivalence
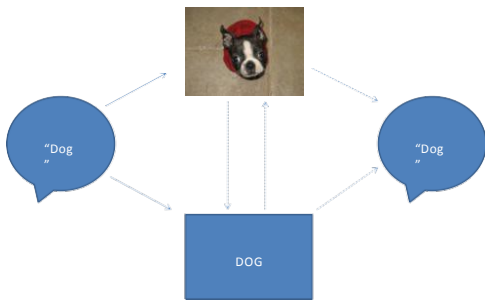
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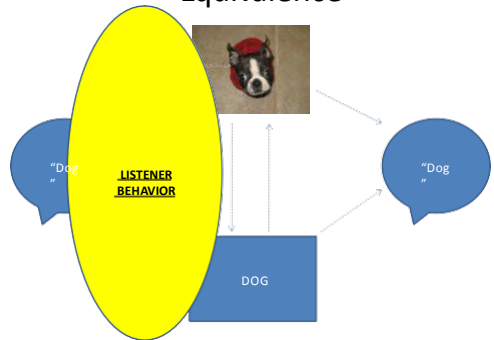
Equivalence

Equivalence

ASR # 33

- Conditional discriminations consist of:
  1. 2 term contingencies
  2. 3 term contingencies
  3. 4 term contingencies
  4. An S-R relation

ASR # 34

- Stimulus equivalence research originated from:
 1. Michael
  2. Terrace
  3. Skinner
  4. Sidman

ASR # 35

- Which of the following exemplifies reading comprehension?
  1. Saying "bicycle" when presented with the written word bicycle
  2. Saying "bicycle" following someone else saying "bicycle"
  3. Pointing to a bicycle when presented with the written word bicycle
  4. Pointing to a bicycle when presented with a picture of a bicycle

ASR # 36

- In order to be a member of the same equivalence class, stimuli must demonstrate:
  1. Symmetry
  2. Transitivity
  3. Reflexivity
  4. All of the answer choices are necessary

Equivalence
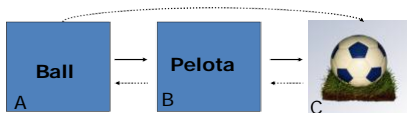
Stimulus Equivalence

- ➢ Understanding the variables responsible for this emergent repertoire is what drives research in the area of stimulus equivalence

- ➢ Unfortunately, the stimulus equivalence paradigm has not yet been completely incorporated into the research and technology to teach children with autism

Applied Equivalence Research

- Constructed-response spelling
  - E.g., Dube, McDonald, McLlvane, & Mackay (1991)
- Fraction-decimal relations
  - E.g., Lynch & Cuvo (1995)
- Reading & spelling
  - E.g., De Rose, De Souza, & Hanna (1996); Sidman (1971; 1973; 1977)
- US geography
  - E.g., LeBlanc, Miguel, Cummings, Goldsmith, & Carr (2003)
- Rectangular coordinate system
  - E.g., Ninness et al. (2005)

Equivalence

- How does the stimulus equivalence technology can be used to teach basic skills to preschool children diagnosed with autism?

Case 1

- To develop an effective, efficient, and comprehensive procedure for level 1 of the already existing curriculum.

- Use stimulus equivalence to generate emergent behavior.

Curriculum Overview

Level	Skill
2	Skip counting-10s Skip counting-5s
3	Single coin counting-P Single coin counting-N Single coin counting-D Single coin counting-Q
4	Mixed coin counting-P+N Mixed coin counting-P+D Mixed coin counting-P+Q Mixed coin counting-N+D Mixed coin counting-N+Q Mixed coin counting-D+Q Mixed coin counting-ALL
5	Constructed response *"Give me $0.0X using least amount of coins."*
6	Compare quantities *"Who has more?"*
7	Sharing money equally *"Give us both the same amount of money."*
8	Compare quantities *"How much more?"*
9	Making Change *"If I give you x, how much should you give me back?"*

Money Curriculum

- What?
  - Develop an effective, efficient, and comprehensive procedure for level 1 of the curriculum sequence.

- How?
  - Use stimulus equivalence to generate emergent behavior.

Coin Equivalence Research

- Coin Summation: Lowe & Cuvo (1976)
  - Count single target coin
  - Sum coin w/ previously trained coins

- Coin Equivalence: Trace, Cuvo, & Criswell (1977)
  - Match mixed coins to target value

- Naming Coin Values: Miller, Cuvo, & Borakove (1977)
 - Generalization from exp to rep
  - Exp more efficient than rec + exp

Stoddard et al. (1989)

- "Produce emergent behavior w/o explicit training".

- General Training Design
  - Pretest
  - Constructed response pretest
  - Component matching
  - Exclusion training
  - Constructed response given coin combo
  - Constructed response given printed price

Method

- Participants
  - Two preschool children diagnosed with autism
    - 6-year-old boys on autism spectrum
    - Dennis: limited vocal repertoire

- Interobserver agreement was 100%
  - Dennis: Collected across 41% of sessions
  - Peter: Collected across 39% of sessions

Trained and Tested Relations
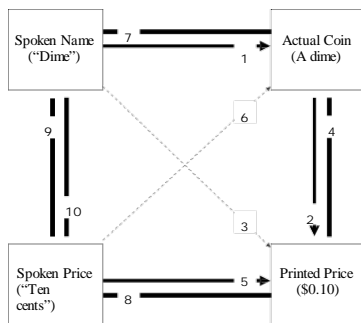
Method

- Baseline
  - 1 session of each relation
- Train relations 1, 2, & 5
  - Unless 88% or better in baseline
- Test relations 3, 4, 6, 7, & 8
  - Train if those relations did not emerge
- Probe relations 1, 2, & 5
- Test relations 9 & 10

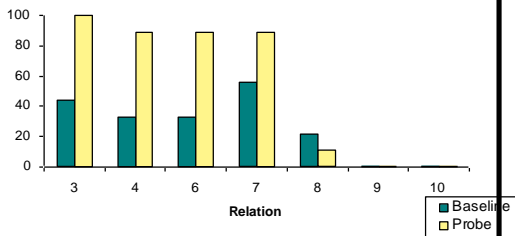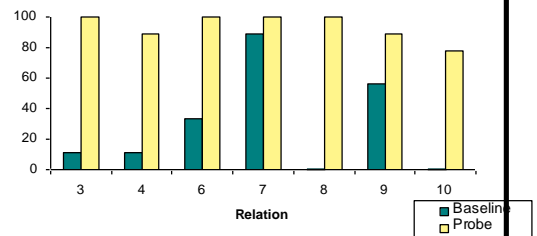Figure 1. Emergent relations - Dennis

Figure 2. Emergent relations - Peter

Summary of Results

- Dennis
  - After training three relations
    - Four additional untrained relations emerged
    - Three did not emerge (8, 9 & 10)
- Peter
  - After training three relations
    - Seven additional untrained relations emerged
    - Relation 10 probe: 7/9 correct

Conclusions & Future Research

- Curriculum incorporating equivalence facilitated mastery in minimal time.
- Three additional relations emerged for student with more advanced vocal bx.
- Future levels of curriculum
  - Skip counting, single coin-type counting, mixed coin counting, constructed response, making change…

ASR # 37

- Which of the following is true regarding stimulus equivalence?
  1. All skills have to be taught directly.
  2. You can teach a few skills and others will emerge without direct teaching.
  3. Stimulus equivalence has only been evaluated in basic research.
  4. None of the answer choices are correct.

ASR # 38

- Case 1:
  1. Involved training 5 relations.
  2. Resulted in both participants learning 7 untrained relations.
  3. Resulted in both participants learning all 5 untrained test relations.
  4. Resulted in both participants learning at least 4 of the untrained test relations.

ASR # 39

- In Case 1:
  1. The participant with advanced language learned the untrained relations, while the participant with limited language did not learn the untrained relations.
  2. Neither of the participants learned the untrained probe relations, as expected.
  3. The participant with advanced language learned the untrained probe relations, while the participant with limited language did not learn the untrained probe relations.
  4. Higher baseline levels most likely contributed to the 2nd participant having better results than the 1st one.

Case 2

- Picture activity schedules may be used to promote independent play in children with autism.
- Ultimately, the pictures may be replaced by printed words.
  - McClannahan & Krantz (1998) suggest a fading procedure to accomplish this task.
- How about conditional discrimination training? Would we be able to produce "reading comprehension"?

Case 2

- To evaluate the effectiveness of conditional discrimination training in the establishment of textual control over an independent activity schedule.

- Assess emergent (linguistic) performance.

Transfer of function

- Rehfeldt and Root (2005) taught conditional discriminations between pictures (PECS) and their dictated names and between dictated names and their corresponding text to individuals diagnosed with MR.
  - All participants demonstrated derived requesting skills
- Murphy et al. (2005; in press) obtained similar results with children diagnosed with autism.

Method

- *Participants*.
  -Ben (6 yrs) communicated using 3- to 5-word sentences, limited sight word vocabulary.
  -Dennis (6 yrs) communicated through scripted 2- to 4-word sentences, limited sight word vocabulary.
- *Setting*. Students' work area.
- *Materials*. 12 cards (pictures of toys and their corresponding printed words).
- *Dependent measures*.
  - Percentage of correct independent play responses in the presence of a printed word displayed on activity schedules.
  - Percentage of correct responses during emergent relations tests.

Method

- *Design*. A multiple-baseline design across two 3-activity sets and a pre/posttest design to assess emergent stimulus relations.
- *Reinforcement*. During training, correct responses were followed by praise and tokens. Testing was conducted under extinction.
- *Interobserver agreement*. IOA was assessed in at least 33% of all sessions and averaged 98% for Ben and 94% for Dennis.
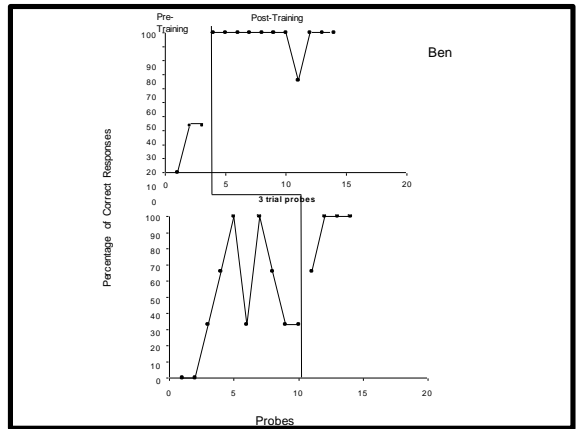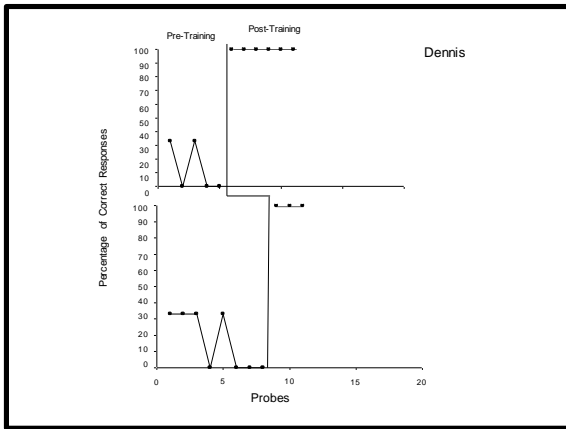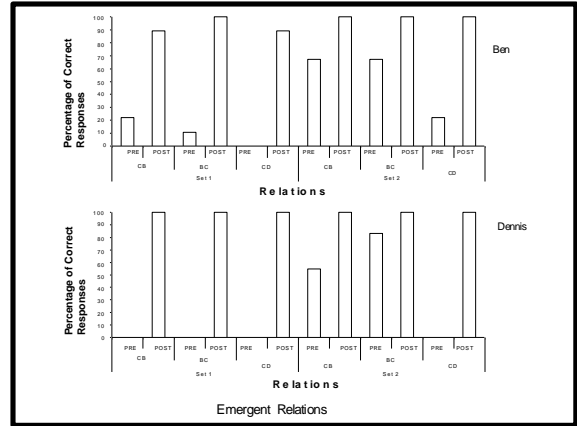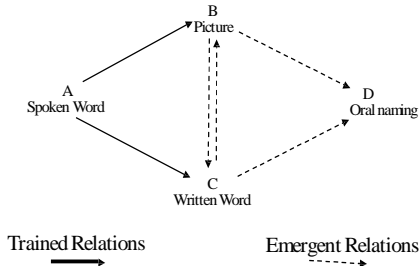
Method

- *Order of conditions:*
  1. Emergent relations pre-test
  2. Textual pre-training probes
  3. Conditional discrimination training (baseline relations)
  4. Textual post-training probes
  5. Emergent relations posttest
- *Emergent Relations Test:*
  - CB = Select picture in presence of written word
  - BC = Select written word in presence of picture
  - BD = Orally name picture
  - CD = Orally name printed word

  - Data collected in 9-trial blocks

Method

- *Textual Probes.* Pictures in the child's activity schedule were replaced by printed words to see whether participants would retrieve the corresponding toy/activity.

- *Trained Relations*. Training consisted of the auditory-visual AB and AC relations.

Trained and Tested Relations

B
Picture

A
Spoken Word

D
Oral naming

C
Written Word

Trained Relations

Emergent Relations

Ben

Dennis

Emergent Relations

Dennis

Ben

Summary of Results

- Pre-test performances for both sets remained variable or below chance levels.
- During post test textual probes, both participants responded accurately at a steady rate across both stimulus sets.
- Both participants demonstrated emergent performance during equivalence tests.

Conclusion

- Participants demonstrated transfer of stimulus control from pictures to texts.
- Conditional discrimination training seemed to be a viable method to establish textual control over independent play.
- Results from emergent relations tests suggested that children comprehended the words.

ASR # 40

- The purpose of Case 2 was to:
    1. Evaluate the effectiveness of conditional discrimination training to teach reading comprehension.
    2. Evaluate the effectiveness of conditional discrimination training to teach sight words.
    3. Evaluate the effectiveness of conditional discrimination training in the establishment of textual control over an independent activity schedule.
    4. Evaluate the effectiveness of conditional discrimination training in the establishment of textual control over creativity.

ASR # 41

- In Case 2:
    1. Training conditional discriminations was more effective than superimposition and fading.
    2. Correct responding reached 100% for both participants after the implementation of conditional discrimination training.
    3. The participants stopped using their picture activity schedules during baseline.
    4. The participants learned to select activities upon looking at the text, but did not demonstrate comprehension.

ASR # 42

•The studies by Rehfeldt and Root (2005) and Murphy et al. (2005):
1. Resulted in the emergence of untrained requests from the participants.
2. Resulted in the participants selecting untrained activities.
3. Included picture activity schedules similar to those used in Case 2.
4. Were different from Case 2 because the participants were typically developing.

Case 3 –Tact X MTS

- To determine if the use of standard conditional discrimination procedures, as well as oral labeling (textual + tact training), would produce emergent responding in children with autism.

Equivalence and Autism

➢ Novel relations among stimuli may be established through the training of both listener (conditional discrimination) and speaker (common tact) training

➢ Although, children with autism may not be able to pass equivalence tests (establish novel relations and emit novel untrained behavior).

➢ Research suggests that this failure can

Equivalence
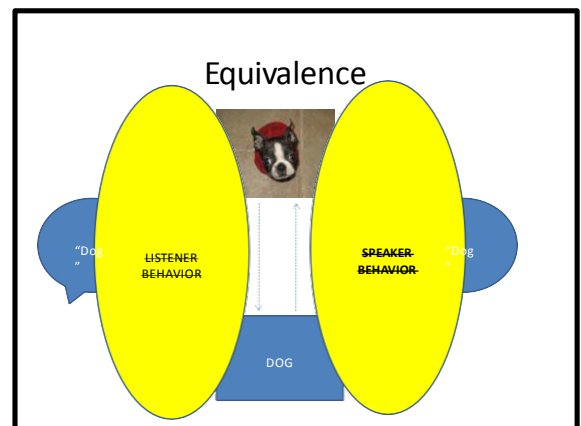
Case 3

➢ The purpose of the current study was to compare the use of standard conditional discrimination procedures (listener training) and textual/tact training (speaker training) in the establishment of classes containing dictated words, pictures and printed words.

➢ These procedures may be used to teach sight-word reading.

Tact Training

- Eikeseth and Smith (1992) demonstrated that tact training may remedy failures on equivalence training/testing.
- Evaluated the formation of equivalence classes in four children diagnosed with autism.
  - After extensive training on conditional discrimination none of the participants were able to perform the emergent relations.
  - After learning to name each stimulus, participants performed better on conditional discrimination tasks and passed tests for equivalence.

Method

Participants
- Three 6-7-year old children (Sam, Eric, & Darren) diagnosed with Autism.

Setting
- Secluded area in children's homes.

Dependent Measures
- Percentage of correct responses during conditional discrimination tests and number of trials to criterion.

Method (Cont'd)

Experimental Design
- An alternating treatments design was used to compare both training procedures. A standard pre/post-test design was used to assess derived stimulus relations.

Materials
- 12 cards depicting pictures of common objects and their corresponding printed names (in Spanish).
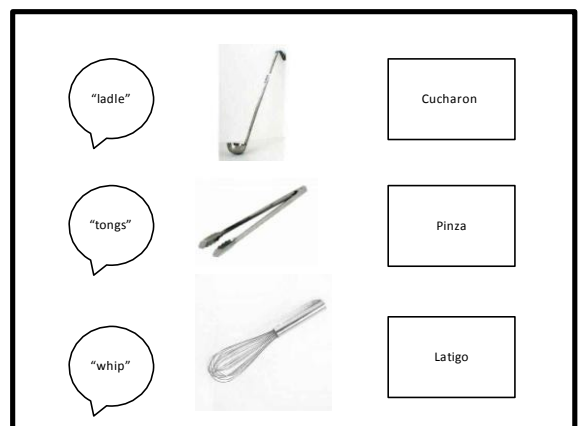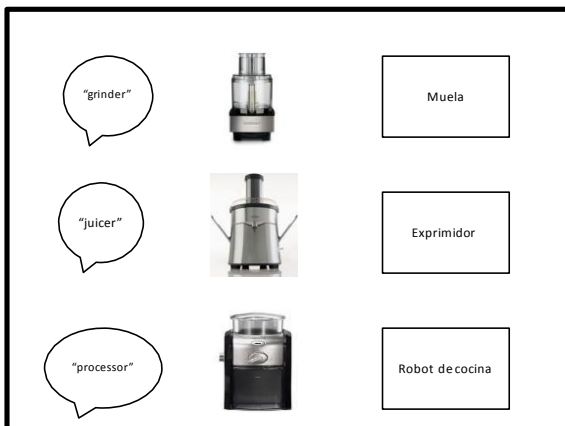
Method (Cont'd)

- Reinforcement
  - During training, correct responses were reinforced with tokens that could be exchanged for tangible items.
  - During pre and posttests non-descriptive praise was given for every response regardless of accuracy

Method (Cont'd)

Pre-training

➢ Selection and observation responses

Pre and Post Tests

➢ All possible derived relations for reading comprehension were tested (AB, AC, BC, CB, BD, and CD) under extinction

Method (Cont'd)

Training

Each Stimulus Set was assigned to one training condition: Listener or Speaker

Listener training consisted of the auditory-visual AB and AC relations.

Speaker training consisted of the BD (tact) and CD (textual) relations.

- Progressive 1s delay with echoic/point prompt
- Incorrect responses or no responses within 5s were followed by 0" delay prompt
- Two consecutive blocks with 8/9 (89%) correct
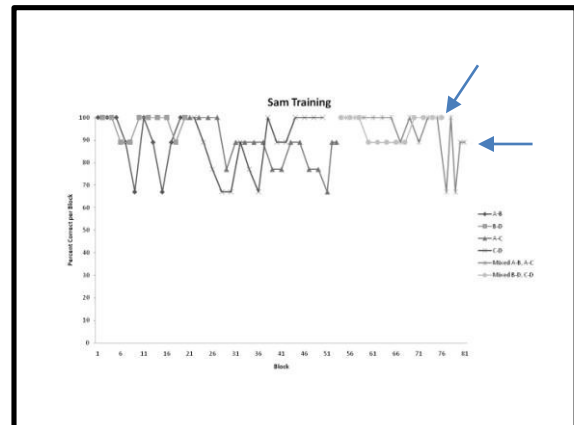
Trials To Criterion

Participant	Listener Relations				Speaker Relations			
	AB	AC	Mixed	Total	BD	CD	Mixed	Total
Sam	90	126	72	**288**	90	13	36	**243**
Eric	90	180	54	**324**	90	72	81	**243**
Darren	72	72	63	**207**	81	81	45	**207**

ASR # 43

- What is the problem with using terms such as expressive or receptive language?
  1. Their use may confuse the learner and inhibit acquisition of the target.
  2. Nothing is wrong with these terms.
  3. Language is treated as if it is something one possesses.
  4. They are imprecise terms that may be interpreted differently across various audiences.

ASR # 44

- Which of the following statements is true?
  1. Untrained listener behavior is more likely to occur following trained speaker behavior.
  2. Untrained speaker behavior is more likely to occur following trained listener behavior.
  3. Untrained speaker and listener behavior are equally as likely to occur when the other class of behavior is trained first.
  4. It is unlikely that untrained behavior will occur following trained speaker or listener behavior.

ASR # 45

- In behavior analysis, naming refers to:
  1. Labeling.
  2. Tacting.
  3. How an object can occasion both speaker and listener behavior.
 4. All of the answer choices are correct.

ASR # 46

- What was the purpose of Case 3?
  1. To assess whether listener behavior or speaker behavior are acquired faster.
  2. To determine whether training listener or speaker behavior results in the establishment of a stimulus class.
  3. To determine if listener behavior can be acquired by teaching speaker behavior.
  4. To determine if speaker behavior can be acquired by teaching listener behavior.

ASR # 47

- The dependent variable in Case 3 was:
  1. The number of correct responses.
  2. The rate of correct responses.
  3. The duration of instruction.
  4. The number of trials to criterion.

ASR # 48

- Which of the following is true regarding case 3?
  1. The speaker relation was mastered faster for all 3 participants.
  2. The listener relation was master faster for all 3 participants.
  3. Speaker and listener relations were mastered with equal amounts of trials for all 3 participants.
  4. None of the statements are true.
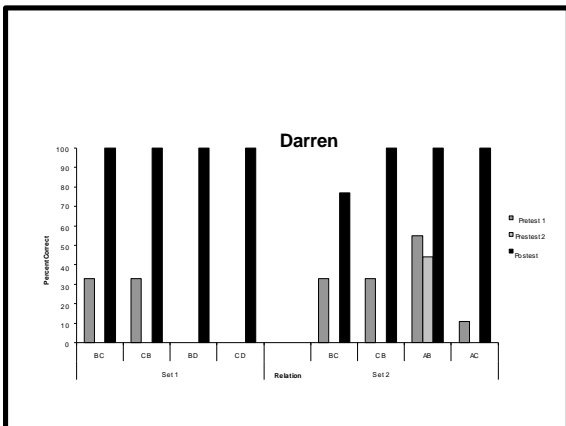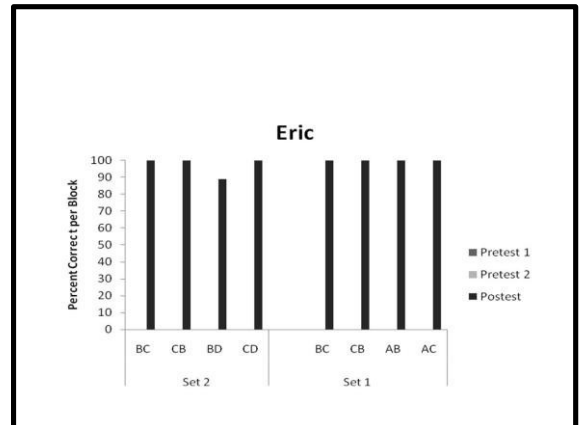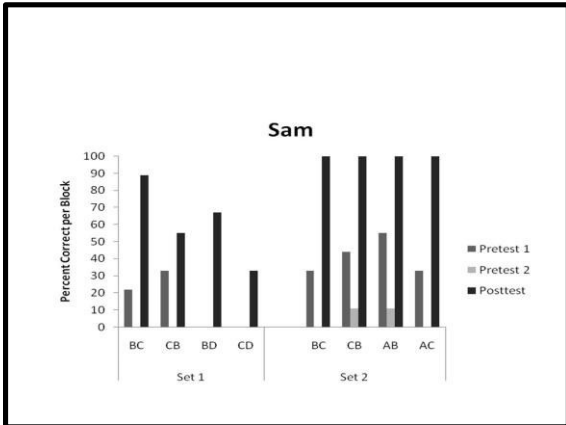
Results (Cont'd)

➢ Both listener and speaker training resulted in the formation of stimulus classes

➢ For both participants, speaker relations were acquired in less trials than listener relations

Results (Cont'd)

➢ For Sam, speaker/VB training (tact and textual) produced more accurate emergent relations than Listener training (conditional discrimination)

➢ Sam's data suggest a possible correlation between the presence of speaker and listener relations (naming) and stimulus class

Conclusion

- Both conditional discrimination and oral labeling (textual + tact) training led to stimulus class formation.
- Stimulus equivalence procedures were successful in teaching reading comprehension to children with autism.
- Future research should further evaluate the effectiveness of verbal behavior training in the development of equivalence classes with children with autism.

Implications

➢ Stimulus equivalence paradigm may inform practitioners on how to program for emergent performance
➢ Design of a "smart curriculum" that would produce emergent relations/novel behavior
  ➢ Categorization/MTS
  ➢ Listener and speaker
➢ Children with autism can "derive"
➢ Understand not only how specific verbal units are acquired, but also how different units inter-relate to give rise to complex/untaught

ASR # 49

- The results of Case 3 suggests that:
    1. Stimulus equivalence procedures may successfully teach reading comprehension.
    2. Teaching speaker relations resulted in more accurate emergent relations.
    3. Teaching conditional discriminations was more effective at creating stimulus class formations.
    4. Teaching oral labeling was more effective at creating stimulus class formations.

ASR # 50

- One of the implications of Cases 1-3 is that:
    1. Specific verbal units are comprised of separate functional classes and therefore require separate teaching.
    2. Children with autism are different from typical children because they have to be directly taught specific skills prior to demonstrating mastery.
    3. Complex/ untaught behavior may arise due to inter-relations between known verbal units.
    4. Emergent relations can be produced only when teaching categorization and speaker behavior.