Teaching compound intraverbals to three school-aged children with autism: A case study (preliminary findings)

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Abstract

Compound verbal conditional discriminations (VC^D) are a type of intraverbal controlled by multiple discriminative stimuli (Sd). Compound VC^Ds are ubiquitous in verbal interactions between people. Many individuals with autism have great difficulty in making conditional discriminations in the intraverbal domain. An inability to respond to compound VC^Ds can have dire consequences for the development of a functional intraverbal repertoire and broader social functioning. The current study seeks to evaluate methods for teaching compound VC^Ds to three children with autism. A within subject, multiple baseline study will be conducted in order to compare four different teaching methods: errorless teaching, stimulus equivalence, stimulus equivalence combined with errorless teaching, and teaching using a differential observing response (DOR). In addition to rates of acquisition, maintenance and generalization of intraverbal skills will be examined.

Method

Participants, Setting, and materials

- 3 school-aged children with confirmed diagnoses of autism attending a day program for intensive behavioural intervention (IBI) (Table 1)
- Testing took place in the participants' regular classrooms at a desk across from an instructor.
- 3x4" laminated pictures (multiple exemplars) were used to teach tacts.
- 4, 3x3, object- colour matrices

Design

- Within subject, multiple baseline

Variables and data collection

- *DV*: Number of independent correct responses
- *IV*: Teaching method used (errorless teaching)
- Data was collected concurrently by the instructor during training and teaching sessions using specially designed data sheets

Pre-experimental language assessments

- The intraverbal subset of the VB-MAPP

Procedure

- *Probe 1:* tacts for compound VC^Ds (e.g. "cardinal"); Receptive categories (e.g. "find the birds"); Simple intraverbals (e.g. "name something red"); Compound VC^Ds (e.g. "what is a red flower?").
- *Probe 2* (conducted after tact training): Compound VC^Ds
- *Tact Training:* Matrix 1 (bird/vegetable/flower X red/yellow/green; figure 1) Vegetables were omitted as all participants were able to provide at least 2/3 correct tacts and 2 participants provided at least one correct response to the compound VC^Ds for those items. The labels for the remaining 6 items were taught. 5 trials were taught per target per session. Targets were interspersed with high probability demands and no target was run multiple times consecutively. Participants were taught using an errorless teaching method using a verbal prompt with a prompt fading schedule of 3 correct trials before fading to the next, lower prompt level. All correct tacts delivered within 3-5 seconds were reinforced with social praise. If a participant erred, the instructor redelivered the Sd at an increased prompt level. Mastery criteria was 100% on all trials across 2 days and 2 instructors.
- *Errorless Teaching Condition (Compound VC^D)* After mastery of the tacts, participants were taught the corresponding compound VC^Ds using an errorless teaching method (see above). Participants were taught 5 trials per target, each session. A single Sd was used in the form *noun-adjective* (e.g. "what is a bird that's red?")

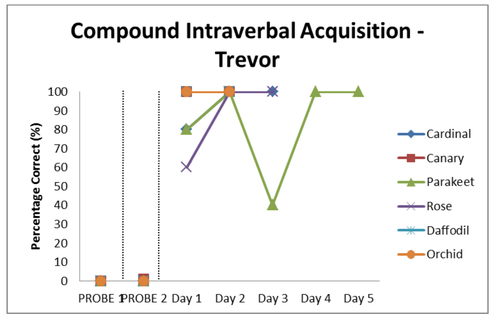
Tables & Figures

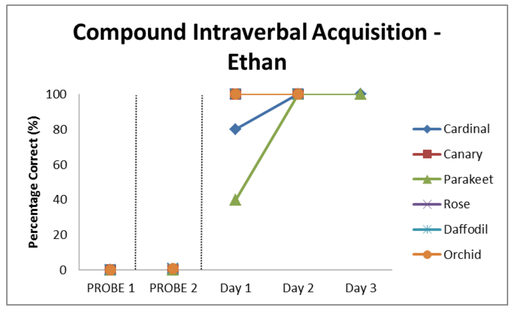
Table 1
Participant Characteristics

Participants	Age	Diagnosis	Sex	Months in IBI (30 hours per week)	VBMAPP Intraverbal subsection (total score)
Trevor	5 years 8 months	Autism	M	8 months	35
Ethan	5 years 9 months	Autism	M	11 months	47
Fiona	7 years 5 months	Autism	F	12 months	35

Matrix 1	Red	Yellow	Green
Bird	What's a bird that's red? (cardinal)	What's a bird that's yellow (canary)	What's a bird that's green (parakeet)
Vegetable	What's vegetable that's red? (tomato)	What's vegetable that's yellow? (corn)	What's vegetable that's green? (cucumber)
Flower	What's a flower that's red? (rose)	What's a flower that's yellow? (daffodil)	What's a flower that's green? (orchid)

Figure 1. A 3x3 object-colour matrix.





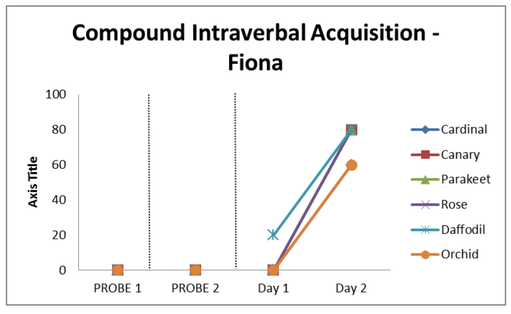


Figure 2. Percentage of correct target compound VC^Ds emitted by Trevor, Ethan, and Fiona.

Results

Probe 1

- Trevor: 3/9 tacts; 3/3 receptive categories; 0/2 simple intraverbals; 0/9 compound VC^Ds correct.
- Ethan: 2/9 tacts; 3/3 receptive categories; 1/2 simple intraverbals; 2/9 compound VC^Ds correct.
- Fiona: 4/9 tacts; 3/3 receptive categories; 0/2 simple intraverbals; 4/9 compound VC^Ds correct.

Tact training

- Trevor: 5 days (25 trials) to mastery of 6 tacts
- Ethan: 4 days (20 trials) to mastery of 3 of 6 tacts - an additional 5 trials to mastery of the remaining 3 tacts
- Fiona: 6 days (30 trials) to mastery of 3 of 6 tacts; cardinal - 40 trials to mastery; parakeet- 45 trials to mastery; canary - 55 trials to mastery.

Probe 2 (following tact training)

- Trevor: 1/6 targeted compound VC^Ds correct - canary
- Ethan: 3/6 targeted compound VC^Ds correct - rose, daffodil, orchid
- Fiona: 0/6 targeted compound VC^Ds correct

Errorless teaching condition: (teaching of compound VC^Ds.)

- Trevor: Mastered 5 of 6 compound VC^Ds after 3 days of teaching (15 trials to mastery). The 6th compound VC^D required an additional 10 trials to mastery.
- Ethan: Mastered all compound VC^Ds after 3 days of teaching (15 trials to mastery).
- Fiona: After two days of teaching, 80% correct responding on 4/6 targets

Discussion

- Training the relevant tacts from a matrix facilitated acquisition of compound VC^Ds in 2 of 3 participants.
  - error correction of the initial compound VC^Ds tested seemed to trigger responses for the other targets.
- Matrix learning can facilitate acquisition of compound VC^Ds

Limitations

- Restricted sample
- Lack of a control condition – a condition with no tact training
- Presently, experimental manipulation has not yet begun for the other teaching methods to be explored in this study (stimulus equivalence, stimulus equivalence combined with errorless teaching, and teaching using a DOR.
  - We cannot report on the most effective method for teaching VC^Ds

Future directions

- Compare different teaching methods - Stimulus equivalence; DOR; Stimulus transfer (tact to intraverbal) strategies
- Use of matrices in teaching conditional discriminations in the intraverbal domain

References & Acknowledgements

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