

## Increasing Speech/Communication in Non-Vocal and Minimally Vocal Children

PRESENTED BY:

B. E. S. T.

BEHAVIOURAL EVALUATION, SUPERVISION &  
TRAINING

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### How do typically developing children acquire speech?

- Cooing, gurgling
- Reduplicated babbling (differential reinforcement of certain sounds, e.g. mama, dada)
- Echoic – direct imitation
- Requesting
- Labeling
- Explosion of expansions (“I want cookie”, or “big goggy”)

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### Differential Reinforcement

- Papa vs Dada?
- Earliest sounds are socially reinforced
- Gross approximations to words → modeling and shaping by parents

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Children with ASD can get stuck at any one of these levels

Examples:

Child may label everything in the environment but not make a request

Child may vocalize constantly but not imitate another's speech sounds

Child may frequently request but not label items or use language socially

Child may engage in inappropriate modes of communication, which having been reinforced, interfere with the development of appropriate speech/communication

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How is Language Measured in a Traditional Linguistic Analysis?

- The focus is on response forms, topography, and structure
- Phonemes: Smallest unit of speech that distinguishes one word from another
- Morphemes: a unit that cannot be further divided, in, come, ing
- Lexicon: The vocabulary of a person
- Syntax: the order of words to create meaningful phrases and sentences
- Grammar: The whole system and structure of a language
- Semantics: The meaning of a word, phrase, sentence or text
- Mean length of utterances (MLU); words, phrases, sentences
- Classification system: nouns, verbs, prepositions, adjectives, adverbs, etc.

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The Behavioral Classification of Language

- A behaviour analytic approach to language development is concerned about the function or the utterance or operant.
- Four of the verbal operants...
- **Echoic:** Repeating what is heard. Saying "Mommy" after someone else says "Mommy"
- **Mand:** Asking for reinforcers. Asking for "Mommy" because a child wants his mommy or for information "Where is Mommy?"
- **Tact:** Naming or identifying objects, actions, events, etc. Saying "Mommy" because a child sees his Mommy
- **Intraverbal:** Answering questions or having conversations where the speaker's words are controlled by other words. Saying "Mommy" because someone else says "Daddy and..."

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### A Functional Analysis of Verbal Behavior: The Basic Principles of Operant Behavior

Motivation → stimulus cue → verbal utterance

Thirsty → see water → ask for a drink

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### A Behavioural Analysis of Lanaguge is concerned with controlling antecedents

- At the core of Skinner’s analysis of verbal behavior is the distinction between the **echoic**, **mand**, **tact**, and **intraverbal** (traditionally all classified as “expressive language”)
- Skinner identified separate sources of antecedent control for these verbal operants
- Verbal S<sup>D</sup>----->Echoic
- EO/MO control----->Mand
- Nonverbal S<sup>D</sup>----->Tact
- Verbal S<sup>D</sup>----->Intraverbal

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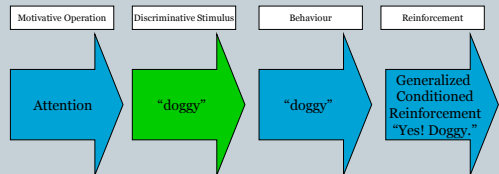
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### The Echoic Relation



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### The echoic relation

- The consequences for the echoic involve generalized conditioned reinforcement e.g. social praise
- The ability to echo the phonemes and words of others is essential for learning to identify objects and actions
- The echoic consists of a “minimal repertoire”
- An echoic repertoire is mandatory for the acquisition of all other functions of verbal speech and signed speech.
- It is not, however, a requirement for alternative forms of communication (voice output systems.)

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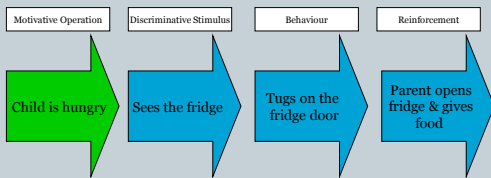
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### The Mand Relation: A request




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### The Importance of the Mand

- Manding brings about desired changes or conditions
- Manding allows a child to control the social environment
- Manding is the only verbal operant that directly benefits the speaker (all other verbal operants and non-specific social reinforcer and therefore occur at a lower rate, if at all)
- Mand training can decrease negative behaviors that serve the mand function
- Manding allows the child to get what s/he wants, when it is wanted
- Manding allows the child to get rid of what s/he does NOT want when it is not wanted
- A parent or caregiver is paired with the delivery of reinforcement related to the mand

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### Issues Concerning Motivative Operations (MOs) and Mands

- All mands are controlled by motivating operations
- There must be an MO at strength to conduct mand training
- MOs vary in strength across time, and the effects may be temporary
- MOs must be either captured or contrived to conduct mand training
- MOs may have an instant or gradual onset or offset
- High response requirement may weaken an MO

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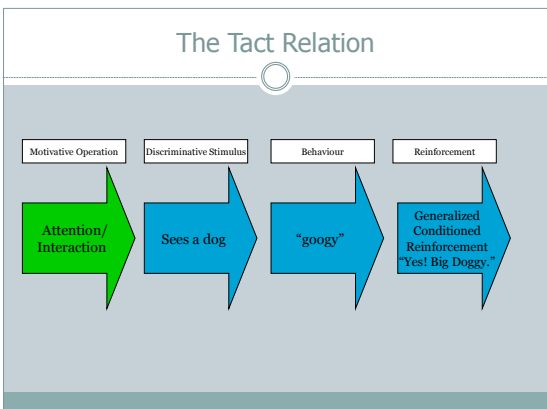
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### Tacts

- Tacts are always under nonverbal stimulus control
- Nonverbal stimuli can be, for example, static (nouns), transitory (verbs), relations between objects (prepositions), properties of objects (adjectives), or properties of actions (adverbs)
- Different sense modes (“contact with the physical environment”)
- Tacts can be controlled by nonverbal discriminative stimuli arising from, for example, visual, auditory, olfactory, gustatory, tactile, kinisthetic, and pain (internal events)
- The consequences for the tact involve generalized conditioned reinforcement

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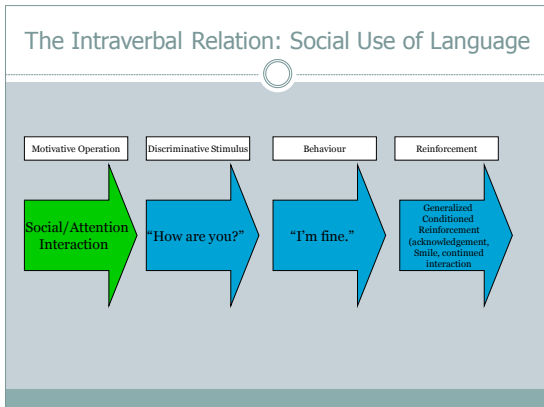
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### Intraverbal

- **NO Point-to-point correspondence:** The verbal stimulus and the verbal response do not match each other, as they do in the echoic relation. (Is the child really saying “Hi” or echoing my “Hi”?)
- Like all verbal operants except the mand, the consequences for the intraverbal involve generalized conditioned reinforcement (also referred to as non-specific conditioned reinforcement)

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### Intraverbal

- Verbal behavior evoked by other non-matching verbal behavior
- It prepares a speaker to behave rapidly and accurately with respect to verbal stimulation, and plays an important role in continuing a conversation
- There is a huge variation in speaker’s intraverbal repertoires, especially when compared to the mand and the tact
- Typical adult speakers have hundreds of thousands of intraverbal relations as a part of their verbal repertoires
- An intraverbal repertoire allows a speaker to answer questions and to talk about objects and events that are not physically present

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### Examples of Intra-verbal Behaviour

Verbal Stimulus	Verbal Response
<i>Twinkle twinkle little...</i>	<i>Star</i>
<i>A kitty says...</i>	<i>Meow</i>
<i>Mommy and...</i>	<i>Daddy</i>
<i>Knife, fork and...</i>	<i>Spoon</i>
<i>What do you like to eat?</i>	<i>Pizza!</i>
<i>What 's your favorite movie?</i>	<i>Sponge Bob Square</i>
<i>Pants!</i>	
<i>Can you name some animals?</i>	<i>Dog, cat, and horse</i>
<i>What 's your brother 's name?</i>	<i>Charlie</i>
<i>Where do you go to school?</i>	<i>ClaytonPark</i>

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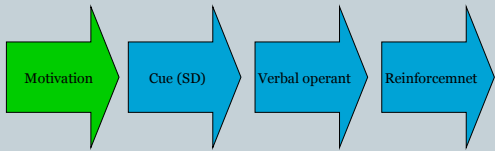
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### 4 Term Contingency



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### Where do we start?

- We start by getting a baseline understanding of how the individual is currently communicating and the function of that communication.
- (See communication data sheet)

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### So what do we do?

- We teach **functional** communication.
- We do this by replacing inappropriate and/or ineffective methods of communication with more appropriate methods of communication.

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### How do we do this?

We need to replace these behaviours with verbal operants that:

- A) are more efficient than undesirable or unclear behaviours (they achieve reinforcement faster)
- B) are less effortful than undesirable behaviours
- C) are understood by many listeners
- D) the inappropriate or inefficient form of communication no longer results in reinforcement

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### Total Communication Approach

- Verbal input (spoken word)
- Visual Input (picture or object)
- Motoric input (sign or gesture)
- Technology / Voice output

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### Basic Verbal Operants: Taught in order

- Echoics (verbal imitation)
  - (not necessary for voice output devices)
- Mands (requesting)
- Tacts (labeling)
  - (much tact training is involved with voice output devices)
- Intraverbals (Social use of language)

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### Echoics

- An echoic is a direct imitation of another person's speech
- Taught through shaping procedures and reinforced by tangible and social positive reinforcement
- Goal is to alter the function of an echoic from automatic reinforcement to tangible/social reinforcement.

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### How do we do this

- Inventory the child's current sound or word repertoire.
- Provide the model.
- Reinforce closer approximations to the word with a meaningful R+ under relevant conditions of motivation.

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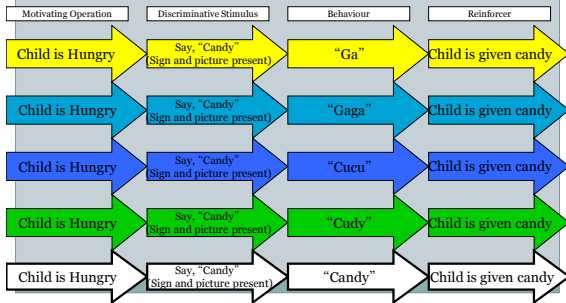
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### Differential Reinforcement




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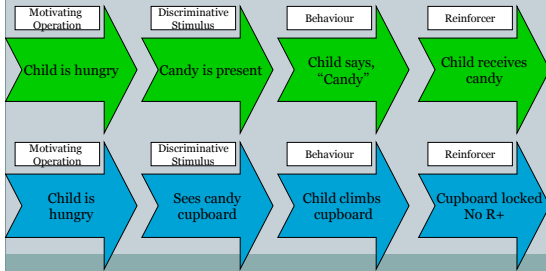
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### Also Differential Reinforcement




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### Manding

- A mand is a verbal operant under the control of a relevant E.O. (typically deprivation or satiation) and is reinforced by a specific reinforcer.

Examples:

I'm thirsty. I ask for a drink from my husband's water bottle. I'm sated.

I'm lost in Toronto. I ask a man I see for directions. I am no longer lost.

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### How to teach manding

- Need to identify what is reinforcing for an individual child.
- Need to stop reinforcing inappropriate methods of acquiring that reinforcer.
- Need to determine the form of the new response (verbal, picture, sign, etc.)

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### How to teach manding continued

- Need to contrive an establishing operation.
- Need to identify the discriminative stimuli that will signal the availability of reinforcement.
- Need to establish many learning opportunities.
- Need to reinforce all attempts.

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### Tacting

- A tact is a verbal operant under the control of the physical environment and is reinforced by generalized social reinforcement.

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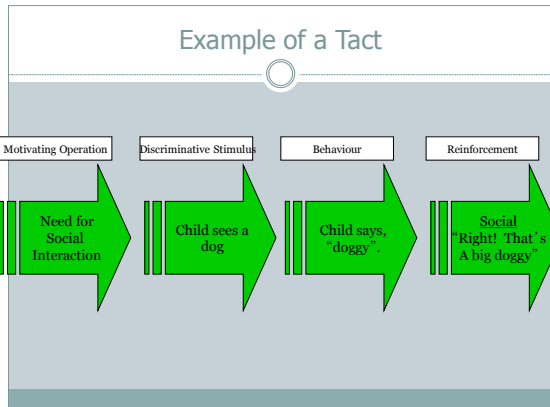
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### Receptive and Expressive tacts

- Receptive tact: Child points to the picture or object labeled by the speaker. E.g. "Find the dog." or "Point to the cat."
- Expressive tacts: Child verbally labels what he she sees. E.g "What is it?"

Note: Neither of these examples are pure tacts because the response follows a question. A pure tact should occur spontaneously and this is the eventual goal of tact training.

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### Importance of Tacts

- Expands the child's vocabulary
- Are necessary in an academic environment (e.g. colours & numbers)
- *BUT, tacts are not as immediately functional as mands for a young learning and should not constitute the bulk of their language training.*

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### How to teach tacts

- Words should be selected because they are meaningful to the child (e.g. if the child has a cat, the word “cat” would be meaningful. More meaningful would be the cat’s name.

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### Receptive Tacts

- If the child is non-verbal we start with receptive tacts (The acquisition of receptive tacts can spontaneously lead to echoics and expressive tacts due to the high level of repetition).
- If the child is verbal, *and* compliant to instructions, we start with expressive tacts.

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### Tact Training

- Select the first five words.
- Use real objects instead of pictures.
- Choose objects that are obviously different from each other.

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### Discrete-trial Training

- Select the first object to be taught.
- Place it on the table.
- Instruct the child to “Point to the e.g. cat.”
- Provide a full physical prompt 2X for the child to point to the cat.
- On the third trial provide a partial prompt (e.g. at the elbow) for the child to point to the cat)

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### Discrete-trial Training continued

- Alternate between 2 full physical prompts and a partial prompt until the child begins to respond to the partial prompt.
- Continue to fade the prompt over subsequent trials until the child is responding to the verbal instruction only.

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### Discrete-trial Training continued

- Move the object around the table such that the child must scan and locate the item before following the instruction to point to it.

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### Discrete-trial Training continued

- When the child is able to give the item regardless of where it is placed on the table it is time to introduce a distracter.
- A distracter is any object which you do not plan to teach. It should be an object with is obviously different than the one you've just taught. The distracter is placed on the table as far away from the teaching object as possible.

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### Discrete-trial Training continued

- Again presented with the instruction, "Point to the cat." \_\_\_\_\_.
- As long as the child continues to respond correctly the distracter is, gradually, over a number of trials, positioned closer and closer to the cat, until they are side by side on the table and equally close to the child.

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### Discrete-trial Training continued

- At his point the distracter and the cat are randomly placed on the right or the left and the child continues to be asked to "Point to the cat."
- Once the child is able to respond correctly 8 out of 10 trials while the cat and distracter are being randomly placed you are ready to introduce the next object for the child to receptively label.

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### Discrete-trial Training continued

- The next label is taught in exactly the same way as the first, by itself and then with a distracter.
- Once the child can receptively label the first two objects, you are ready to start discrimination training.

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### Discrete-trial Training continued

- Discrimination training: Place the two objects side by side on the table. Randomly ask the child to "Point to A or B" . Do not alternate the position of the items until the child is scoring at least 60 to 70% accurately.
- Next, randomize the position of the two objects and randomize your instruction.

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### Discrete-trial Training continued

- Once the child has mastered discrimination of the first two items, introduce the third, fourth, and so on, according to the item flow chart.

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### Standard Discrete-trial Training Flowchart

• Mass trial A	80% x 3
• A with distracter	80% x 1
• Mass trial B	80% x 3
• B with distracter	80% x 1
• Discrimination A/B	80% x 3
• Mass trial C	80% x 1
• Discrimination Session C/A	80% x 1
• Discrimination Session A/B/C	80% x 3
• Mass trial D	80% x 1
• Discrimination Session D/B	80% x 1
• Discrimination Session A/B/C/D	80% x 3
• Mass trial E	80% x 1
• Discrimination Session E/C	80% x 1
• Discrimination Session A/B/C/D/E	80% x 3

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### Discrete-trial Training continued

- **Note:** In receptive labelling only two items are ever placed on the table at one time. For example, A may be presented with B on one trial; D with A on other; E with C on another and so on.
- Expressive labelling discrete-trial training has no distracter stage.

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### Tacts *must* be generalized

- Generalization must occur with novel exemplars of the objects (e.g. different looking cats; picture of cat vs. actual cat).
- Generalization must occur across novel environments and with novel mediators.
- Pure tacts must become free of the stimulus conditions (especially the instruction) in which they were initially acquired.

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### Intraverbal Operants

- An intraverbal is a verbal operant under the stimulus control of another verbal operant and is reinforced by generalized social reinforcement.
- An Intraverbal repertoire is necessary for the development of the social use of language.

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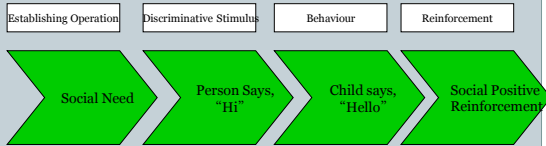
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### Example of a very common Intraverbal



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### Prerequisites to Teaching Intraverbals

- The child must be able to make reasonable approximations to spoken words.
- The child must be able to tolerate slight delays to reinforcement.
- The child must possess, even a limited, interest in songs and/or simple turn-taking activities.

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### Why are Intraverbals so important

- Simple intraverbals are the building blocks to the use of language for social purposes.
- Poorly developed ABA curriculums inadvertently teach children to respond only when asked a question or given a specific instruction → Prompt dependence.

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### Intraverbal Operants

- Intraverbals should be taught as early as possible in a language intervention program.
- Intraverbal training is most effective when taught in play-based, naturally occurring and naturally motivating settings.

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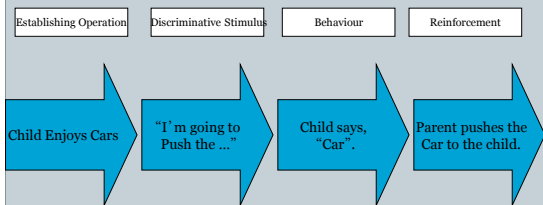
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### Play-based Intraverbal Training



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### Intraverbal Operants

- In the previous example, the word “car” was not a pure intraverbal. It was part mand, since the function of saying “car” was likely to receive the car.
- However, the response “car” was emitted directly following the parent’s lead-in and therefore constitutes a simple, if in-pure intraverbal.

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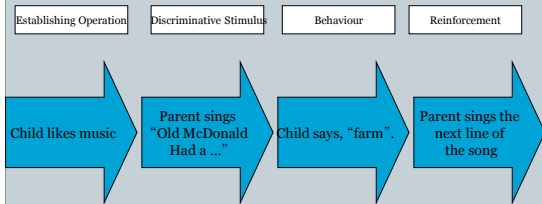
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### Another play-based example



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### Intraverbal Operants

- The previous example of an intraverbal is a better example of a pure intraverbal. The response “farm” is reinforced by the next utterance from the parent.

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### Intraverbal Operants

- Structured verbal turn-taking sessions can help promote intraverbal language in children who possess phrase and sentence level speech but are not using language socially.

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### Structured Intraverbal Training

- Select one picture for yourself and a different picture for the child on a related theme (e.g.: two animal pictures).
- To make this activity more fun or game-like, you may take turns selecting a picture from a concealed bag, or drawing cards from a face down deck on the table. The instructor starts the conversation (e.g. "I have a duck

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### Intraverbal Operants

<b>Parent</b>	<b>Child</b>
I have a duck. →	I have a cow.
My duck is yellow. →	My cow is white.
My duck says quack. →	My cow says "moo".

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### Intraverbal Operants

#### Teacher

My name is Ms. Smith →  
I live in Ajax. →  
My favourite food is spaghetti. →

#### Child

My name is John.  
I live in Whitby.  
My Favourite food is  
pizza.

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### Intraverbals

- Some individuals may never understand the importance of an using an intraverbal repertoire but at a minimal level there are,
- “non-optional social conventions”
  - Sheldon Cooper

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### Voice output technology

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### Pros

- Easy to use and to program
- Easy to purchase applications
- Inexpensive compared to computers and speech generating devices
- Portable
- Socially Acceptable and interesting to peers
- Can be highly personalized (e.g. photos vs board maker symbols)
- Children with Autism are attracted to it
- Children with autism can often learn how to use it with minimal instruction

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### Cons

- When children are using technology they are not interacting in the same way as through speech or sign language
- May have to deal with some repetitive behaviours
- Applications are not always malleable (programmable, adjustable, or contain enough exemplars)
- Not always practical in certain environments such as the pool or park.

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### Proloquo@Go

- Comes pre-loaded with a home page which you will want to change right away.
- For most children photos are better than icons and less is more.
- Huge vocabulary
- Add your own photos or google images (google images must be saved to your photo directory first)
- Easy, on-the-spot changes or additions to a page
- Can display one or many icons per page
- Great on-line support

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Setting up the home page

- My Day
- Each icon represents each activity of the day
- Breakfast
- Greeting teachers
- Prayer
- O Canada
- Morning Circle
- Break time
- Seat work...

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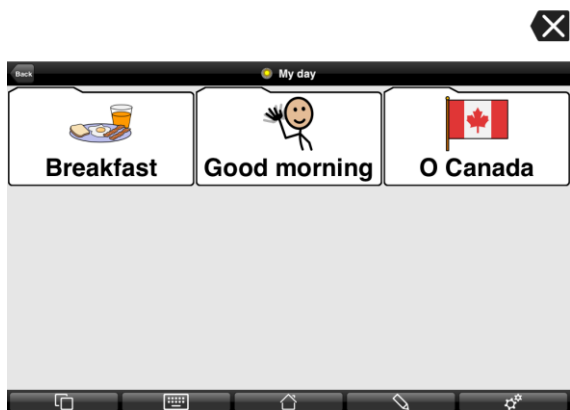
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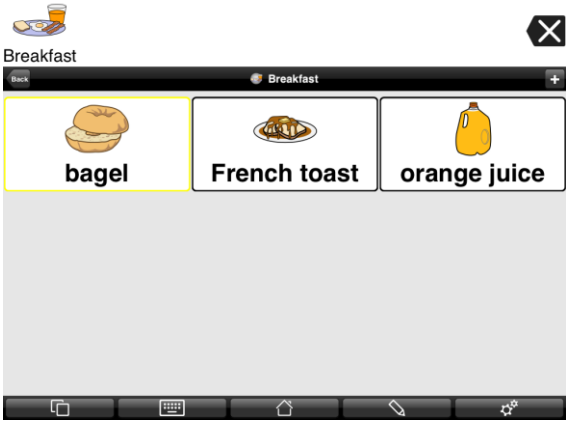
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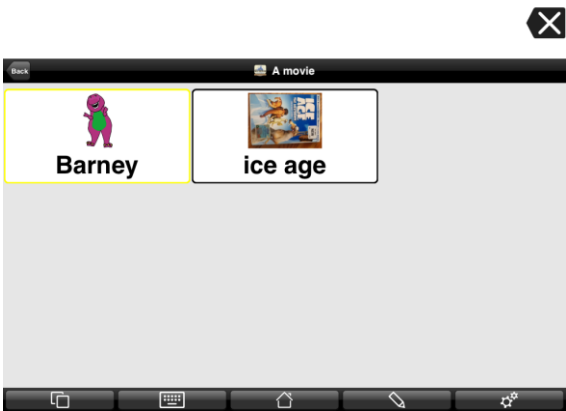
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**Go Talk Now**

- For children for whom picture discrimination is difficult.
- For children who have difficulty generalizing (e.g. has to be there exact milk and milk container to know that it's milk)

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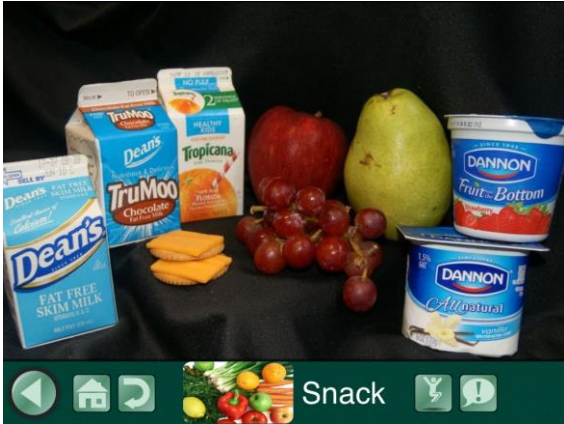
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Summing it up!

- Like all behaviour, verbal behaviour has to be under the control of some type of motivation and discriminative stimuli.

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Summing it up!

- Great language programming includes all functions of language, not just arbitrary labeling.

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Summing it up!

- Language programming for children with ASD cannot be entirely play-based, but must *move* to play and natural situations.

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Lastly

Thank you!

For other training events please visit:

[www.KerrysPlace.org](http://www.KerrysPlace.org)

Or

[www.BEST4Autism.ca](http://www.BEST4Autism.ca)

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