

## The need for both Natural Environment Teaching and Structured Teaching in intervention programmes using ABA for children with autism

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## Seminar objectives

- ▶ To introduce Skinner's Analysis of Verbal behaviour as the basis to teach language and communication to children with autism
- ▶ To illustrate the differences between ABA structured teaching based on DTT and ABA naturalistic approaches to teaching language
- ▶ To discuss the need for both approaches in a comprehensive and effective ABA educational programme for children with autism

## Discrete Trial Teaching

- ▶ An approach that uses repetition of learning opportunities to build skills
- ▶ Initial applications in the 1960s by Sidney Bijou's research group
- ▶ Further developed by Ivaar Lovaas with first applications to children with autism in the 1970s and 1980s

## Components of DTT

- ▶ Basic learning unit is the discrete trial:

A single learning opportunity that follows the basic behavioural contingency of

SD → R → SR+

- ▶ Repeated blocks of discrete trials are delivered on specific skills with prompts being faded systematically and with differential reinforcement given accordingly

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## Which skills to teach

- ▶ Curricula that use DTT focus on a comprehensive range of skills
  - ▶ Visual performance
  - ▶ Motor Imitation
  - ▶ Verbal Imitation
  - ▶ Expressive Language
  - ▶ Receptive Language
  - ▶ Play
  - ▶ Self-help
  - ▶ Academic skills
  - ▶ Social skills

## Skill hierarchy in typical DTT-based programmes



### Another approach to language teaching...

- ▶ Around the same time that Lovaas (1987) was developing the UCLA model of intervention, another group of researchers and practitioners (e.g., Sundberg, Michael & Partington) were working on developing procedures to teach language using Skinner's Analysis of Verbal Behaviour.

### Verbal Operants (Skinner, 1957):

The many independent functions of one word

MAND	TACT	ECHOIC	INTRAVERBAL	LISTENER
When thirsty "water"	When pointing to a leaking roof "water"	When playing with parent: "Can you say water?" "water"	When in class: "What is H <sub>2</sub> O?" "water"	"there's a fire, hurry, go and get some water!" Jane goes and gets water
Receives water	Receives thanks	Receives tickles	Receives praise	

### Natural Environment Training

- ▶ Centres around the child's immediate interests and activities as a guide for language instruction (Sundberg & Partington, 1999)
- ▶ Consequences for correct verbal responses are specific to the child's interest and activities
- ▶ The focus is initially on increasing spontaneous manding (requesting)

### Motivating Operations

- ▶ A change in the environment (internal or external) that alters the value of a stimulus as a reinforcer and evokes behaviour that has previously contacted that stimulus
- ▶ A few examples:
  - ▶ Salty crisps increase the value of water
  - ▶ Being alone increases the value of social attention
  - ▶ Door locked increases the value of obtaining a key
  - ▶ Getting a head-ache increases the value of aspirin

### Mands

- ▶ A mand is a verbal operant directly controlled by the ongoing MO that specifies its own reinforcer
  - ▶ Not having a watch and wanting to know the time are likely to evoke in the presence of an audience, the mand "what's the time please?"
  - ▶ Being at a restaurant, having eaten salty food and the absence of water on the table are likely to evoke the mand "Could I have some more water please?" to a waiter

### Verbal episode: Mand

- ▶ The contextual cue for a mand is an MO (e.g., thirst)
- ▶ The Listener first reinforces the Speaker's verbal behaviour (Bv1).
- ▶ The reinforcer is relevant to the MO (e.g., juice)
- ▶ The Listener is then reinforced by the Speaker's Bv2

Speaker	EO: Thirst	Bv1 "Please pass the juice"	Sr+=Sd Receives juice	Bv2 "Thank you"
Listener		[Please pass the juice] Sd	Passes juice B	[Thank you] Sr+

### Features of the mand

- ▶ Generally the first operant class to be acquired
- ▶ Individuals with Developmental Disabilities tend to develop maladaptive/problem mands
- ▶ Echoics and Tacts do not necessarily transfer to mands.

### First stages of NET

- ▶ **PAIRING:**
  - ▶ Favourite items are removed from the environment, they are visible but inaccessible to the student. The adult delivers the reinforcers to the student for free.
  - ▶ Once the student repeatedly and spontaneously approaches the adult to gain reinforcers, mand training can begin

### Early Mand sequence:

- ▶ Manding for visible reinforcers
- ▶ Manding for non-visible reinforcers
- ▶ Manding for actions

*Provide hundreds of daily opportunities for the student to mand for preferred items*

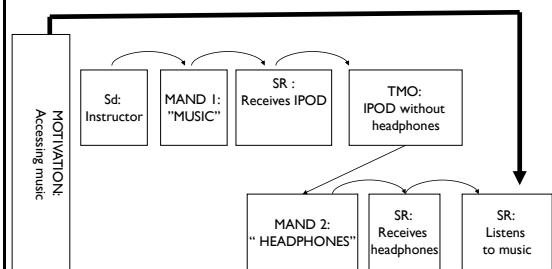
### Beyond the first few mands

- ▶ Now the student has learned to ask for 10 to 20 items, what now?
- ▶ The student will need to learn to mand for items that are not highly preferred and thus begin to build greater use of vocabulary through contriving transitive motivating operations

### Transitive MOs

- ▶ *Transitive MOs convert a neutral stimulus into a conditioned reinforcer, that is one stimulus increases the reinforcing value of a second stimulus.*
- ▶ The interrupted chain procedure (Hall & Sundberg, 1987), involves contriving a situation so that a portion of a behavior chain is interrupted and cannot be completed unless a mand occurs.

### Example:



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## Summary of Mand Sequence

- ▶ Manding for visible items
- ▶ Manding for non visible items
- ▶ Manding for actions
- ▶ Manding for missing items to complet activity
- ▶ Manding with attributes
- ▶ Manding with prepositions
- ▶ Manding for information (question asking)

## Differences between DTT and NET

(Adapted from Sundberg & Partington, 1998)

	DTT	NET
STIMULUS	Chosen by the instructor Repeated until criterion achieved Functional independent from the natural environment	Chosen by the child Variable Specific to the context in which it naturally occurs
INTERACTION	Instructor presents the items Not functional to the interaction	Instructor and child interact with the same materials
RESPONSE	Correct responses or approximations are differentially reinforced	Contingency is less rigid
CONSEQUENCE	Non specific to the interaction Tangibles, social praise	Natural contingencies of reinforcement, i.e. reinforcers are inbuilt in the activity

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## Beginner NET example

- ▶ C: sees book
- ▶ C: "book"
- ▶ T: you want BOOK! Gives book, but keeps it closed
- ▶ C: "open"
- ▶ T: "OPEN" and opens book
- ▶ T: allows child to look at book
- ▶ T: "point to the teddy"
- ▶ C: points to the teddy
- ▶ T: "what's this?" (while pointing to cup in the book)
- ▶ C: "cup"
- ▶ T: "excellent!"
- ▶ C: "turn page"
- ▶ T: turns page

## Intermediate NET example

- ▶ C: "I want Painting!"
- ▶ T: "let's do some painting"
- ▶ C: "let's do some painting"
- ▶ T: gives paint only
- ▶ C: "I want brush"
- ▶ T: "Where is it?" while pointing to the top of open cupboard
- ▶ C: "on top of the cupboard"
- ▶ T: "yes, go and get them"
- ▶ C: tries to reach box but can't
- ▶ C: "Help me!" T: "what's wrong?"
- ▶ T: "too high!"
- ▶ C: "Ok"
- ▶ T: gets the box of brushes
- ▶ C: "open box"
- ▶ T: opens box and holds up a big brush and a little brush
- ▶ C: "big brush"
- ▶ T: gives brush. Now the child has brushes and paints
- ▶ C: "apron" T: "I need an apron!"
- ▶ C: "I need an apron"
- ▶ T: gets the apron

## ...continued

- ▶ C: "give me the apron"
- ▶ T: gives it to the child
- ▶ C: puts on the apron
- ▶ T: "what are we going to paint on?"  
C: "paper!"
- ▶ T: ok, go and get it from the bottom of the cupboard
- ▶ C: goes to the cupboard and gets paper
- ▶ T: "paint something that is round, yellow and has rays"
- ▶ C: paints a yellow circle
- ▶ T: "we need to add the rays, do this!"
- ▶ C: copies painting the rays

## Advanced NET example

- ▶ T: "I have a present for you...."
- ▶ C: "what is it?"
- ▶ T: "it's something that comes in a box, and you put in a DVD player..."
- ▶ C: "is it a video?"
- ▶ T: "yes...."
- ▶ C: "which video?"
- ▶ T: "it's Tarzan?"
- ▶ T: "Who is Tarzan?" (while showing the video cover)
- ▶ C: "He is a man, he has long hair...."
- ▶ T: "I don't know where he lives...."
- ▶ C: "he lives in the jungle...."
- ▶ T: "Wow! And who else lives in the jungle?"
- ▶ C: "Elephants, lions, tigers...."

.... continued

- ▶ T: "You are right, shall we watch it then?"
- ▶ C: "yes!"
- ▶ T: "How do I turn it on?"
- ▶ T: "First ....."
- ▶ C: "First, turn the TV on"
- ▶ T: Tutor turns on TV
- ▶ T: "then ...."
- ▶ C: "then, put the DVD in"
- ▶ T: puts the DVD in
- ▶ C: "then, press play" T: presses play
- ▶ T: "what's going to happen now?"
- ▶ C: "We are going to watch Tarzan!"

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### Advantages and Disadvantages of NET

Advantages	Disadvantages
Use of child's interests to guide learning	Training is difficult to conduct in formal classrooms
Best conditions to teach spontaneous communication	Requires expertise from instructors in capturing and contriving motivation
Use of stimuli present in the child's natural environment	Requires better training on the part of the instructors
Reduced need for complicated generalisation procedures	Not always possible to deliver specific reinforcers
Reduced risk of non-compliance	Child's MO may be unknown to the trainer
Verbal responses are more typical as they occur the natural context in which a child is expected to engage in them	Curriculum not scripted, more difficult to know what to do/ask
Verbal responses are mixed together	Data collection more complicated
	Reduced number of training trials

### Advantages and Disadvantages of DTT

Advantages	Disadvantages
Allows for a high number of training trials	Responses don't automatically generalise without elaborate generalisation procedures
Easy to teach people how to do it	Prompts to respond not always present outside training sessions
Instructors always know what to teach	Mainly adult initiated activities
Fast way to teach tacts, receptive, echoic, matching, imitation	Immediate and powerful reinforcers used in training may not be available outside training sessions
Easy to run in a classroom setting	Rote responding
Responses and consequences are clear	The interaction between speaker and listener may be very different from what naturally happens in life
Progress (or lack of) immediately and directly observable	Data collection more complicated
Child learns quickly the association between response and reinforcers	Teaching and instructors may become paired with aversive situations

- ▶ Previous tables were adapted from Sundberg and Partington (1999)

### NET and DTT integrated across the curriculum

PROFILE	TIME ALLOCATION	SKILLS TARGETED
Beginner: no language, play or imitation skills	NET > DTT	Pairing, manding, compliance, imitation, receptive, tacts
Beginner: mands, imitation, receptive, tacts	NET = DTT	Manding, receptive, play, tacts
Intermediate	NET = DTT	Greater use of vocabulary as receptive, tacts, intraverbals, symbolic and independent play
Advanced	DTT > NET	Language learning mainly in NET and social groups Academic skills mainly in DTT

Thank you for your attention!

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