NATURAL ENVIRONMENT TEACHING

- The most effective teaching of language includes teaching in all settings throughout the day, across persons and circumstances.
- In addition, a full, rich language repertoire of a child includes:
  - nonverbal responses to what someone says (listener behavior)
  - verbal responses specific to his/her motivation or MO (mands)
  - verbal responses that match exactly what someone else just said (echoic)
  - verbal responses to nonverbal stimuli in the environment (tacts)
  - verbal responses to what someone else just said that do not exactly match what was just said (intraverbal)
• To develop a complete language repertoire like this, it is essential to teach a child to respond this way in the natural environment as well as during formal intensive teaching.

Presentation Overview

• Comparison of naturalistic teaching approaches (NTAs) and discrete trial instruction (DTI)

• Natural environment teaching (NET) by learner profile (early, intermediate and advanced learners)
### Naturalistic Teaching Approaches (NTAs)
- Loosely structured sessions paced by the student (e.g., typical play setting)
- Free operant responding
- No pre-specified order for instruction; target stimuli selected based on the student’s motivation
- Target stimuli are varied every few trials
- Reinforcers are functionally related to responses
- Loose shaping contingencies; any vocalization is reinforced
- Decreased need for specific procedures to target generalization because target stimuli, reinforcers, and prompts are present in natural environments

### Discrete Trial Instruction (DTI)
- Highly structured sessions paced by the teacher (e.g., student seated at table across from teacher)
- Discrete learning trials
- Specific scope and sequence for instruction; target stimuli selected irrespective of the student’s motivation
- Target stimuli repeated until criteria are met
- Responses and reinforcers are not functionally related
- Correct or successive responses are often reinforced
- Requires special procedures for generalization because target stimuli, reinforcers, and prompts are not present in natural environments

(adapted from Delprato, 2001; Koegel, O’Dell, & Koegel, 1987; and Sundberg & Partington, 1999)

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### Examples of Teaching Language in a Natural Environment

- Teaching a child to request various toys during a free play period.
- Teaching a child to request food items and receptively identify utensils during snack time.
- Teaching a child prepositions while playing with a dollhouse.
- Teaching a child to label colors while doing a highly preferred art activity.
- Teaching a child to ask and answer “wh” questions while playing a game, such as *Guess Who*.
- Teaching a child to fill-in missing words while singing songs as a class.
- Teaching a child to count while helping to pick out produce at the grocery store.
Reasons to Teach Language in the Natural Environment

1. Since responses are selected based on the student’s motivation they may be learned (acquired) more quickly.
2. Best condition to teach manding (requesting).
3. Uses stimuli, prompt strategies, and reinforcers that are present in the student’s natural environment.
4. Teaching can be conducted by everyone the student interacts with (e.g., teachers, parents, peers).
5. Typically associated with less aversive conditions and therefore less problem behavior (Koegel, Koegel, & Surratt, 1992).
6. Interactions can more easily represent typical conversational exchanges (i.e., can more easily mix across different response types on a natural way).
7. Less need for specific strategies for generalization since the settings in which the responses are taught are the settings in which most responses will later be required.

Methods for Teaching in a Natural Environment

- Several different evidenced-based NTAs have been developed:
  - Incidental Teaching
  - Mand-Model
  - Time Delay
  - Milieu
  - Natural Language Paradigm (NLP)
  - Pivotal Response Training (PRT)
  - Natural Environment Teaching (NET)

- For reviews on the various approaches to teaching language in the naturalistic settings see Charlop-Christy & LeBlanc (1999), Delprato (2001), LeBlanc, Esch, Sidener, & Firth (2006), Peterson (2004), and Sundberg & Partington (1999).
Incidental Teaching

Goals
– Increase the frequency and improve the complexity of a student’s spoken language

Procedures (Hart & Risley, 1974; Fenske, Krantz, & McClannahan, 2001)
– Set up the environment with materials of interest to the student
– Wait for the student to initiate an interaction with or request for an object
– Require the student to use more elaborate or complex language
  • 30 second time delay
  • Tell the student to ask for object
  • Ask questions to evoke more elaborate language
  • Model the response
– Provide the object of interest

This procedure has been used to teach adjective-noun combinations (Hart & Risley, 1968, 1974), compound sentences (Hart & Risley, 1975), conversational skills (McGee, Krantz, & McClannahan, 1984), prepositions (McGee, Krantz, & McClannahan, 1985), reading (McGee, Krantz, & McClannahan, 1986), receptive object labels (McGee, Krantz, Mason, & McClannahan, 1983), and spontaneous and imitative speech (Charlop-Christy & Carpenter, 2000).

Mand-Model

Goals
– To increase the frequency and complexity of spoken language by manding (requesting) for the student to emit vocalizations

Procedures (Peterson, 2004)
– Set up the environment with materials of interest to the student
– Wait for the student to initiate an interaction with or request for an object
– Mand (request) for the child to emit a vocalization by modeling the desired response
– Deliver the object of interest

This procedure, which is an extension of incidental teaching, has been used to teach novel words and novel word combinations (Rogers-Warren & Warren, 1980) and has been shown to promoted generalization across settings and time (Warren, McQuarter, & Rogers-Warren, 1984).
Time Delay

Goals
- To teach students to initiate verbal interactions (i.e., to teach students to emit spontaneous spoken language)

Procedures
- Identify a situation in which the students wants an object or help
- Wait for the student to initiate a response, typically between 2 to 15 seconds
- Model the response if the student does not initiate within the time delay period
- Deliver the object or assistance requested

This procedure, which is also an extension of incidental teaching, has been used to teach requests at meal times (Halle, Marshall, & Spradlin, 1979), requests during free play, snacks, and lunch (Halle, Baer, & Spradlin, 1981), spontaneous requests across settings (Charlop, Schreibman, & Thibodeau, 1985), saying “I love you” in response to being hugged (Charlop & Walsh, 1986), and spontaneous speech across settings (Charlop & Trasowech, 1991; Ingenmey & Van Houten, 1991).

Milieu Teaching

Goals
- Increasing the frequency and variety of spontaneous language within the context of everyday social interactions

Procedures (Alpert & Kaiser, 1992)
- Training should be conducted in the natural environment by a significant other in the student’s life (e.g., parents, siblings, teachers, peers)
- Language training should be functionally related to the student’s interests
- Linguistic forms, their functions, and strategies for learning language should all be trained simultaneously
- Training periods should be brief and incorporate procedures from the models of incidental teaching, the mand-model, and time delay
- Training should have a focus on generalization

This procedure, which is a combination of incidental teaching, the mand-model procedure, and time delay with other naturalistic teaching techniques, has been used to increase overall use of language (Alpert & Kaiser, 1992; Kaiser, Hancock, & Nietfeld, 2000; Hancock & Kaiser, 2002), frequency of spontaneous language (Hemmeter & Kaiser, 1994), and increased mean length of utterance (MLU; Peterson, Carta, & Greenwood, 2005).
Natural Language Paradigm (NLP)

Goals
– To combine aspects of NTAs with aspects of DTI to improve spoken language

Procedures
– Model a vocalization and directly reinforce any attempts at imitation.
– Take turns passing a toy or other motivating stimulus back and forth between student and teacher.
– Model a variety of spoken statements for each toy and frequently rotate across several different toys.
– Share control with the student by follow his/her request to change toys or change activities with a toy.

This procedure, which is based off of incidental teaching, has been used to increase imitative, deferred imitative, and spontaneous vocalizations (Koegel, O’Dell, & Koegel, 1987; Laski, Charlop, & Schreibman, 1988).

Pivotal Response Training (PRT)

Goals
– To focus instruction on a few core, or pivotal, areas (e.g., increasing motivation, responding to multiple cues, initiating social interactions, and self-managing) which will result in better educational proficiency and a decreased need for services

Procedures
– A variety of procedures used to target individual core target areas have been described throughout the literature

These procedures, which are based off of the NLP, have been used to teach symbolic play skills (Stahmer, 1995) and spontaneously asking “What’s that?” (Koegel, Koegel, Shoshan, & McNearney, 1999).

(For more details about PRT see Koegel et al., 1989.)
Natural Environment Teaching (NET)

Goals
– Increasing the frequency and variety of verbal behavior across all verbal operants

Procedures (Sundberg & Partington, 1998, 1999)
– Set up the natural environment in a way that is easy to contrive motivation for a variety of reinforcers
– When the student displays motivation, prompt a verbal response
  • Time Delay
  • Model
– Deliver reinforcers specific to the motivation
– Use stimulus control transfer procedures to transfer control of mands from an instructor’s prompt to the presence of the item and eventually to the MO
– Use stimulus control transfer procedures to transfer responses from mands (requests) to other operants under different sources of control
– Vary antecedent stimuli and response requirements so as to mix and vary across the verbal operants

These procedures, which are based off of the NLP, have been used to teach “where” and “who” mands for information (Sundberg, Loeb, Hale, Eigenheer, 2002), to teach spontaneous mands that occur solely under the control of the MO (Sweeney-Kerwin, et al., 2007), to teach mands for missing items (Hall & Sundberg, 1987; Sigafoos, Doss, & Reichle, 1989), to improve the acquisition of tacts following mand training (Arntzen & Almas, 2002; Carroll & Hesse, 1987), and to improve the echoic and tact repertoires following mand training (Drash, High, & Tudor, 1999).

Comparing NET and Other NTAs

<table>
<thead>
<tr>
<th>NET</th>
<th>Other NTAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Uses a behavioral analysis of language to guide development of teaching procedures and selection of targets</td>
<td>• Uses a traditional (linguistic) analysis of language to guide development of teaching procedures and selection of targets</td>
</tr>
<tr>
<td>• Teaching is conducted in the natural environment</td>
<td>• Teaching is conducted in the natural environment</td>
</tr>
<tr>
<td>• Environment is set up so as to contrive motivation and capture teaching opportunities</td>
<td>• Environment is set up so as to contrive motivation and capture teaching opportunities</td>
</tr>
<tr>
<td>• Focus is on teaching all of the verbal operants (i.e., mand, tact, echoic, mimetic, and listener behavior)</td>
<td>• Focus is primarily on teaching spontaneously language in the forms of requests</td>
</tr>
</tbody>
</table>
NATURAL ENVIRONMENT TEACHING

• The most effective teaching of language includes teaching in all settings throughout the day, across persons and circumstances.
• In addition, a full, rich language repertoire of a child includes:
  – nonverbal responses to what someone says (receptive)
  – verbal responses specific to his/her motivation or MO (mands)
  – verbal responses that match exactly what someone else just said (echoic)
  – verbal responses to nonverbal stimuli in the environment (tacts)
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• To develop this repertoire, it is essential to teach a child to respond this way in the natural environment as well as during formal intensive teaching.
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- Teaching a child to request food items and receptively identify utensils during snack time.
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5. Typically associated with less aversive conditions and therefore less problem behavior (Koegel, Koegel, & Surratt, 1992).
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**Natural Environment Teaching (NET)**

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NET
by Learner Profile

NET for Early Learners
### Natural Environment Teaching: Early Learners

#### Student Profile:
- Limited basic skills
- Weak echoic
- Almost no formal mands
- Few receptive responses outside of the context
- Few tacts
- Few intraverbals

#### Teaching Objectives:
- Put very few demands on the child and pair yourself with reinforcers.
- Have child take reinforcers from you.
- Gradually increase response requirement.
- Begin errorless teaching of mands with full complement of prompts and then fade prompts.
- Intersperse a few instructional demands for easy tasks.
- Move to the formal teaching setting briefly and mand for reinforcers.
### EARLY LEARNER NET LESSON PLAN: ANTHONY

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pairing</td>
<td>N/A</td>
</tr>
</tbody>
</table>
| Playing with Blocks | Mands (requests):  
|               |   • “Block” (sign)  
|               |   • “Go” (vocal)  
| Receptive     |  
|               |   • Stack the block  
|               |   • Put the block on top  
| Motor Imitation: |  
|               |   • Knocking down blocks  
|               |   • Stacking blocks  
| Intraverbals: |  
|               |   • Ready, set, “go” (part mand)  

**VIDEO (Anthony with Christy)**

### EARLY LEARNER NET LESSON PLAN: SOFIA

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
</table>
| Spinning | Mands (requests):  
|          |   • “Spin” (vocal)  
|          |   • “All done” (vocal)  

**Katy ABCs**  
**Katy Old McDonald**

**VIDEO (Sofia with Emily)**
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sesame Street</td>
<td>Mands (requests):</td>
</tr>
<tr>
<td>Musical Toy</td>
<td>• Sesame Street characters (&quot;Ernie,&quot; &quot;Grover,&quot; &quot;Cookie Monster,&quot; &quot;Zoe,&quot; &quot;Big Bird,&quot; &quot;Elmo&quot;)</td>
</tr>
<tr>
<td></td>
<td>• &quot;Pull&quot;</td>
</tr>
<tr>
<td></td>
<td>Receptive:</td>
</tr>
<tr>
<td></td>
<td>• Feet</td>
</tr>
<tr>
<td></td>
<td>• Stomp feet</td>
</tr>
<tr>
<td></td>
<td>• Clap hands</td>
</tr>
<tr>
<td></td>
<td>• Big Bird's eyes</td>
</tr>
<tr>
<td></td>
<td>• Ernie</td>
</tr>
<tr>
<td></td>
<td>Motor Imitation:</td>
</tr>
<tr>
<td></td>
<td>• Stomping feet</td>
</tr>
<tr>
<td></td>
<td>• Nodding head</td>
</tr>
<tr>
<td></td>
<td>• Arms up</td>
</tr>
<tr>
<td>Tact (labeling):</td>
<td>• Sesame Street characters (&quot;Big Bird,&quot; &quot;Zoe&quot;)</td>
</tr>
</tbody>
</table>

**VIDEO (Max with Emily)**  Max 2 Bobby/Brian

Leanne with Joey, Working Hard

---

**NET for Intermediate Learners**
NATURAL ENVIRONMENT TEACHING:
INTERMEDIATE LEARNERS

STUDENT PROFILE:
• Several mands, some of which are emitted under the control of the motivating operation (MO) and the transitive motivation operation (CMO-T)
• Some receptive language, including some RFFCs (receptives by feature, function, and class)
• Many tacts
• Simple intraverbals

TEACHING OBJECTIVES:
• Teach within the context of the activities which are reinforcing and motivating for the child.
• Teach Mands, simple tacts, receptive, RFFC, and simple intraverbals.
• Many of these responses will be multiply controlled (e.g., part or mostly mand).
• Begin the VB module in this environment.
• Move the teaching gradually to more intensive teaching settings.
### INTERMEDIATE LEARNER NET LESSON PLAN: JOHNNY

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Project: Coloring and gluing a pig picture</td>
<td>Mands (requests):</td>
</tr>
<tr>
<td></td>
<td>• “Paint” (sign)</td>
</tr>
<tr>
<td></td>
<td>• “Scissors” (sign)</td>
</tr>
<tr>
<td></td>
<td>• “Glue” (sign)</td>
</tr>
<tr>
<td></td>
<td>• “Paper” (sign)</td>
</tr>
<tr>
<td></td>
<td>Tact (labeling):</td>
</tr>
<tr>
<td></td>
<td>• “Pig”</td>
</tr>
<tr>
<td></td>
<td>Intraverbal:</td>
</tr>
<tr>
<td></td>
<td>• Oink, oink... “pig”</td>
</tr>
<tr>
<td></td>
<td>• Moo, moo... “cow”</td>
</tr>
<tr>
<td></td>
<td>• Pig... “oink, oink”</td>
</tr>
<tr>
<td></td>
<td>• Meow... “cat”</td>
</tr>
</tbody>
</table>

**Managing Problem Behavior**  
*Andy*

**VIDEO (Johnny with Cindy)**

### INTERMEDIATE LEARNER NET LESSON PLAN: KAITLIN

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• “Book” (sign)</td>
</tr>
<tr>
<td></td>
<td>• “Candy” (sign)</td>
</tr>
<tr>
<td></td>
<td>Tact (labeling):</td>
</tr>
<tr>
<td></td>
<td>• “Bird”</td>
</tr>
<tr>
<td></td>
<td>• “Duck”</td>
</tr>
<tr>
<td></td>
<td>• “Horse”</td>
</tr>
<tr>
<td></td>
<td>• “Frog”</td>
</tr>
<tr>
<td></td>
<td>• “Cat”</td>
</tr>
<tr>
<td></td>
<td>• “Dog”</td>
</tr>
<tr>
<td></td>
<td>• “Sheep”</td>
</tr>
<tr>
<td></td>
<td>• “Fish”</td>
</tr>
<tr>
<td></td>
<td>Intraverbal:</td>
</tr>
<tr>
<td></td>
<td>• Brown “bear,” brown “bear” (part tact)</td>
</tr>
</tbody>
</table>

**Katie ABCs**

**VIDEO (Kaitlin with Laura)**
# Intermediate Learner NET Lesson Plan: Declan

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading a picture book</td>
<td><strong>Mands (requests):</strong></td>
</tr>
<tr>
<td></td>
<td>• &quot;Turn the page&quot;</td>
</tr>
<tr>
<td></td>
<td>• &quot;Read&quot;</td>
</tr>
<tr>
<td></td>
<td><strong>Receptive:</strong></td>
</tr>
<tr>
<td></td>
<td>• Cake</td>
</tr>
<tr>
<td></td>
<td>• High 5</td>
</tr>
<tr>
<td></td>
<td>• Bee</td>
</tr>
<tr>
<td></td>
<td>• Cat</td>
</tr>
<tr>
<td></td>
<td><strong>Motor Imitation:</strong></td>
</tr>
<tr>
<td></td>
<td>• Itsy bitsy spider song movements</td>
</tr>
<tr>
<td></td>
<td><strong>Tact (labeling):</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Intraverbal:</strong></td>
</tr>
<tr>
<td></td>
<td>• Duck… &quot;quack, quack&quot;</td>
</tr>
<tr>
<td></td>
<td>• Clock… &quot;tick tock, tick tock&quot;</td>
</tr>
<tr>
<td></td>
<td>• Train… &quot;choo choo&quot;</td>
</tr>
<tr>
<td></td>
<td>• Bee… &quot;buzz&quot;</td>
</tr>
<tr>
<td></td>
<td>• &quot;Itsy Bitsy Spider&quot; song fill-ins (e.g., &quot;spider&quot;… &quot;spout&quot;… &quot;rain&quot;… &quot;out&quot;…&quot;sun&quot;)</td>
</tr>
<tr>
<td></td>
<td>• &quot;Wheels on the Bus&quot; song fill-ins (e.g., &quot;bus&quot;… &quot;round and round&quot;… &quot;town&quot;… &quot;waa&quot;)</td>
</tr>
</tbody>
</table>

**VIDEO (Declan with Danielle)**

---

**NET for Advanced Learners**
NATURAL ENVIRONMENT TEACHING: ADVANCED LEARNERS

STUDENT PROFILE:
• Many spontaneous mands, including mands for information
• Complex tacts
• RFFCs
• Intraverbals
• Some math skills
• Some reading skills

TEACHING OBJECTIVES:
• Teach within the context of the reinforcing or motivational activities of the child.
• Complex VB modules that are conversations within non-verbal contexts.
• These modules include answers to "wh" questions as well as manding for information (i.e., asking "wh" questions).
• Have similar but less complex conversations in the intensive teaching settings.
## ADVANCED LEARNER NET LESSON PLAN: CODY

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
</table>
| **Art Project:** Making a butterfly | Mands (requests):  
  • “How do we do it?”  
  • “Can I do it?”  
  • “Next color”  

  **Tact (labeling):**  
  • Parts a features of a butterfly (e.g., “wings,” “antenna,” “body,” “legs”) |
| **Reading a book:** “Caterpillar Spring” | Mands (requests):  
  • “Turn the page”  

  **Receptive:**  
  • Sleeping  
  • Woodpecker  

  **Tact (labeling):**  
  • “Sun,” “caterpillar,” “another bird,” “ladybug,” “ant,” “bee,” “dragonfly,” “leaf,” “flower,”  
    “butterfly”  
  • Parts and features of a butterfly (e.g., “wings,” “antenna,” “body,” “legs”)  
  • “Yes?”/”No”  
  • Pronouns (e.g., “his”)  

  **Intraverbal:**  
  • What says tweet, tweet? – “bird”  
  • What does a bee say? – “buzz”  
  • Tell me something that swims in the water – “fish” |

### VIDEO (Cody with Cindy)

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## ADVANCED LEARNER NET LESSON PLAN: CODY

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WHAT THE LEARNER WILL TALK ABOUT</th>
</tr>
</thead>
</table>
| **Reading a book:** “The Big Truck Book” | Mands (requests):  
  • “Wait”  

  **Tact (labeling):**  
  • “Farm truck”  

  **Intraverbal:**  
  • Tell me some other vehicles – “Garbage truck”… “passenger train”… “car”… “bike” |

### End of last video for this video

NET Videos