Disseminating ABA into Public Schools: Prior and Current Research at the University of Houston, Clear Lake

Dorothea C. Lerman, Ph.D., BCBA-D
Introduction

- Barriers to dissemination
  - Training time
  - Resources
  - Availability of qualified trainers

Prior and Current Research

- **Focused Training on Core ABA Teaching Procedures**
  - Outcomes of a five-day summer training program (preference assessments, discrete-trial teaching, incidental teaching)
    - Lerman, Vorndran, Addison, & Kuhn (2004)
    - Lerman, Tetreault, Hovanetz, Strobel, & Garro (2008)
  - Comparison of written, vocal, and video-assisted feedback
    - Luck, Lerman, Wu, Dupuis, & Hussein (under review)
Focused Training on Core ABA Teaching Procedures

- Pyramidal training of peers and paraprofessionals

  Woo, Lerman, Luck, Dupuis, & Bao (in preparation)
  Lerman, Luck, Smothermon, Zey, Custer, & Smith (in preparation)
Introduction

- Training to Identify Potential Antecedents/Consequences of Problem Behavior
  - Narrative versus structured A-B-C recording
    - Lerman, Tetreault, Hovanetz, Stroble, & Garro (2008)
  - Computer-based training in A-C detection
    - Scott, Lerman, & Luck (in preparation)
Five-Day Focused Training

**Topics**

- Basic Concepts of Applied Behavior Analysis
- Preference Assessments
- Behavioral Assessment
- Discrete Trial Teaching
- Shaping and Chaining
- Generalization and Maintenance of Skills
- Incidental Teaching
- IEP Goals/Objectives
- Data Collection
- Managing Problem Behavior

*Includes both didactic and hands-on training*
Lerman et al. (2004)

Baseline (in Role Play)

Discussion and Handouts

Role Play with Feedback

In-Situ

Feedback
Main Classroom (DTT)

No Feedback
Main Classroom (Pref Assessment, Incidental Teaching)

No Feedback
Generalization Setting (DTT and Incidental Teaching)
Conclusions

- Teachers acquired large number of skills via brief intensive training

- In-situ feedback unnecessary for some ABA skills (preference assessment, incidental teaching)

- Skills generalized across children and locations

- Data collection impractical
Lerman et al. (2008)

Baseline (in situ) → Discussion and Handouts → Role Play with Feedback → In-Situ Practice with Feedback → Follow-up in Teacher’s Classroom

“All-Trial” Data Collection Replaced Trial-by-Trial Data Collection
Lerman et al. (2008)
Lerman et al. (2008)
Conclusions

- Brief, intensive training effective
- Practical for practitioners
- Adequate reliability/sensitivity of measurement
- Monthly feedback sufficient to maintain skills
- What type of feedback?
Comparison of Different Types of Feedback
Luck et al. (under review)

- Commonly Used in Classrooms
  - Vocal
  - Written

- Beneficial Alternative?
  - “Video Assisted”

- Examined effectiveness and preference (choice)
Part 1: Vocal vs Written Feedback

Paired Choice (PS) vs Multiple Stimulus Without Replacement (MSWO) Preference Assessments

<table>
<thead>
<tr>
<th>Participant</th>
<th>PS</th>
<th>MSWO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meredith</td>
<td>Written</td>
<td>Vocal</td>
</tr>
<tr>
<td>Christina</td>
<td>Vocal</td>
<td>Written</td>
</tr>
<tr>
<td>Bernice</td>
<td>Written</td>
<td>Vocal</td>
</tr>
<tr>
<td>Betty</td>
<td>Vocal</td>
<td>Written</td>
</tr>
<tr>
<td>Robin</td>
<td>Written</td>
<td>Vocal</td>
</tr>
<tr>
<td>Trudy</td>
<td>Vocal</td>
<td>Written</td>
</tr>
</tbody>
</table>
Part 1: Vocal vs Written Feedback

Paired Choice (PS) vs Multiple Stimulus Without Replacement (MSWO) Preference Assessments

- **Written**: No questions answered. Could reference between sessions.
- **Vocal**: Questions answered. Unable to write notes.
Part 2: Vocal/Written vs. Video-Assisted Feedback

DTT with least-to-most (LTM) vs most-to-least (MTL) prompting hierarchies

<table>
<thead>
<tr>
<th>Participant</th>
<th>LTM</th>
<th>MTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meredith</td>
<td>Written</td>
<td>Video</td>
</tr>
<tr>
<td>Christina</td>
<td>Written</td>
<td>Video</td>
</tr>
<tr>
<td>Bernice</td>
<td>Video</td>
<td>Vocal</td>
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Part 2: Vocal/Written vs. Video-Assisted Feedback

DTT with least-to-most (LTM) vs most-to-least (MTL) prompting hierarchies

- **Written**
  - No questions answered
  - Could reference between sessions

- **Vocal**
  - Questions answered
  - Unable to write notes

- **Video**
  - Session recorded
  - Feedback delivered as video played
  - Questions answered
Part 1 Results
Part 1
Representative Results
Part 2 Results
Part 2
Representative Results
## Effectiveness - Summary

<table>
<thead>
<tr>
<th>Participant</th>
<th>Written vs. Vocal</th>
<th>Written vs. Video</th>
<th>Vocal vs. Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meredith</td>
<td>Written</td>
<td>Equal</td>
<td>N/A</td>
</tr>
<tr>
<td>Christina</td>
<td>Equal</td>
<td>Video</td>
<td>N/A</td>
</tr>
<tr>
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<td>Trudy</td>
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<td>Equal</td>
<td>N/A</td>
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</tbody>
</table>
Part 1
Choice

Part 2
Choice
Part 1
Representative Results

Cumulative Number of Selections

Sessions

Part 2
Representative Results

Cumulative Number of Selections

Sessions
<table>
<thead>
<tr>
<th>Participant</th>
<th>Written vs. Vocal</th>
<th>Written vs. Video</th>
<th>Vocal vs. Video</th>
<th>Overall Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meredith</td>
<td>Vocal</td>
<td>Written</td>
<td>N/A</td>
<td>Vocal</td>
</tr>
<tr>
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Conclusions

- All forms of feedback generally effective
- Majority showed preference for one type
- Training thus far restricted to teachers!!!
Pyramidal Training of Paraprofessionals
Lerman et al. (in preparation)

- Targeted Skill: DTT using LTM + Error Correction
- 16 teacher-paraprofessional pairs
- BST to mastery for teachers
- Given all necessary materials; told “teach as you think practical in classroom”
- Descriptive analysis of outcomes
Outcomes for Paraprofessionals
Outcomes for Paraprofessionals: Representative Results

- **Sarah (Claire)**
  - BL Test
  - In-Situ (Child) Test
  - In-Situ (Sim) Test
  - Gen. Test

- **Zoey (Olivia)**
  - BL Test
  - In-Situ (Sim) Test
  - In-Situ (Child) Test

- **Diane (Kassandra)**
  - BL Test
  - In-Situ (Sim) Test
  - In-Situ (Child) Test

- **Madison (Patti)**
  - BL Test
  - In-Situ (Child) Test
  - In-Situ (Sim) Test
  - Gen. Test
Trainer (Teacher) Integrity – Use of Components

Graphs showing the use of components in different scenarios:

1. **Initial BST**
   - Instructions
   - Modeling
   - Role Play

2. **In-Situ (Simulation)**
   - Praise
   - Corrective Feedback
   - Data Collection

3. **In-Situ (Child)**
   - Praise
   - Corrective Feedback
   - Data Collection
Trainer (Teacher) Integrity – Correct Use

**Graph 1: Initial BST**
- Percentage of Components Covered
- Instructions, Modeling, Role Play

**Graph 2: In-Situ (Simulation)**
- Percentage of Opportunities (Correct)
- Praise, Corrective, Data, Info

**Graph 3: In-Situ (Child)**
- Percentage of Opportunities (Correct)
- Praise, Corrective, Data, Info
Findings

- All paraprofessionals adequately trained

- 7 of 16 trainers received experimenter feedback

- Mean training time = 263 min (range, 125 min – 325 min)

- Trainers used essential BST components
  - More likely to correct than praise
  - Least likely to collect integrity data
  - But no clear relationship to training outcome!
Identifying Potential Antecedents/Consequences of Problem Behavior Through A-B-C Recording

- Benefits of competency
  - Descriptive data provides information to
    - Generate hypotheses
    - Design functional analysis
    - Evaluate intervention effects
  - Reduces inadvertent reinforcement of problem behavior?

- Lerman, Hovanetz, Strobel, & Tetreault (2009)
  - Narrative vs structured A-B-C recording (accuracy/ease)

- Scott, Lerman, & Luck (in preparation)
  - Computer-based training (detection of multiple and subtle events)
<table>
<thead>
<tr>
<th>EVENT</th>
<th>DESCRIPTION</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eddie was told to go to gym class</td>
<td>Yelled, threw a book, and sat on the floor</td>
<td>Eddie was told to stop misbehaving. He was kept in the classroom instead of going to gym.</td>
</tr>
<tr>
<td>The class was watching a movie; I was working at my desk</td>
<td>Ran out of the classroom</td>
<td>I retrieved Eddie and made him sit near my desk</td>
</tr>
<tr>
<td>Eddie was working with the speech therapist</td>
<td>Yelled and tried to hit the speech therapist</td>
<td>He was returned to the classroom and placed in time out</td>
</tr>
</tbody>
</table>
## Structured A-B-C

<table>
<thead>
<tr>
<th>DATE: __________________________________</th>
</tr>
</thead>
</table>

| __Aggression  | __Ignored By Someone | __Attention, Response |
| __Self-Injury | __Material/Food Removed | Block |
| __Elopement   | __Other Request Denied  | __Redir. to Other Activity |
| __            | __Given Instruction/Prompt | __Material or Food Given |
| __            | __None                  | __Work Terminated |
| __            |                        | __No Response |

| __Aggression  | __Ignored By Someone | __Attention, Response |
| __Self-Injury | __Material/Food Removed | Block |
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| __            |                        | __No Response |
Lerman et al. (2009)

Overall Occurrence Nonoccurrence Per Response

<table>
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<th>Percentage Accuracy</th>
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<tr>
<td>Overall</td>
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<td>Occurrence</td>
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<tr>
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Antec Conseq Antec Conseq Antec Conseq

Occurrence Nonoccurrence Per Response

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Antec Conseq Antec Conseq Antec Conseq

Lerman et al. (2009)
Conclusions

- Modestly accurate under ideal recording conditions
- Neither sufficient to reliably identify function
- Structured form
  - Decreased likelihood of misses (particularly consequences)
  - Preferred by majority of teachers
- Problems detecting simultaneous or subtle events?
Can we improve the detection of simultaneous/subtle events?

- **Simultaneous Events**
  
  Examples:
  
  **Antecedents:**
  
  demand delivered + tangible removed
  
  **Consequences:**
  
  escape + attention delivered
Can we improve the detection of simultaneous/subtle events?

- Subtle Events
  Examples:
    - Antecedents:
      class-wide instruction delivered
      materials presented w/out vocal instruction
    - Consequences:
      neutral attention delivered
      alternative tangible offered
      demand delayed
Computer-Based Training
(Scott et al., in preparation)

- Will training with single exemplars generalize to other exemplars?
- Will training with single antecedents/consequences generalize to simultaneous antecedents/consequences?

- 20 “Test” Videos:
  - 6 responses (3 single/3 simultaneous)
  - 22 ant/con (4 trained; 18 other)

- Training Video
  - Lecture
  - Models
  - Practice
Computer-Based Training
(Scott et al., in preparation)

- **Experiment 1: (N = 18)**
  - Part 1: Single Exemplar Training
  - Part 2: Multiple Exemplar Training
  - Part 3: Simultaneous Event Training

- **Experiment 2: (N = 20)**
  - Part 1: Simultaneous Single Exemplar Training
  - Part 2: Multiple Exemplar Training
Computer-Based Training
(Scott et al., in preparation)

Conclusions

- Computer-based training effective
- Generalized across multiple exemplars
- Simultaneous training critical
  - But false alarms!
Questions/Comments?

Thank You!!

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