EVALUATING THE EFFECTS OF TRAINING IN INCIDENTAL TEACHING IN INSTRUCTORS OF STUDENTS WITH ASD

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Background & Problem

- Rates of autism: 1 in 68

- Individuals with autism
  - often lack the ability to communicate needs and desires.
  - Difficulty in acquiring and using language naturally

- Empirically based strategies are not readily incorporated into teaching practices.

- Instructors are not readily trained in empirically based strategies.
Significance of the Study

- Research on staff training in incidental teaching (known to be effective) is limited

- Limited evidence of the most effective procedures to train staff in this area and of staff generalization of this teaching method

- This study examined the effects of training for staff on the implementation incidental teaching, generalization of these skills, and student language outcomes.
Research Questions

1. Is explicit training in incidental teaching procedures effective in increasing the correct implementation of incidental teaching in instructors of students with autism?

2. Does staff training in incidental teaching improve staff generalization and use of incidental teaching across environments and language targets?

3. Is the language production of children with autism increased by the training and correct implementation of incidental teaching procedures for instructors?
Why Incidental Teaching?

- Successfully demonstrated in increasing skills such as expressive language, social skills, communicative interactions, receptive language and reading (Farmer-Dougan, 1994; McGee et al., 1985; McGee & Daly, 2007; McGee et al., 1983; McGee et al., 1986; Schepis et al., 1998)

- Shown to increase generalization of language in individuals with autism (Koegel & Rincover, 1974)
Staff Training

• Incorporate combination of lecture, question and answer, role play, and feedback have been considered the most advantageous (Lerman et al., 2008; Schepis et al., 2000; Parsons et al., 1996; Gardner, 1972)
• Role play and feedback effectively used to train paraprofessionals to implement incidental teaching using (Schepis et al., 2001)
• Graphical feedback as an effective means to train preschool teachers to implement incidental teaching (Casey & McWilliams, 2008)
What does the literature say?

- Only one study was found that examined both aspects of student and teaching performance (Ryan et al., 2008).
- Researchers analyzed the effects of brief training protocols on incidental teaching episodes and student initiations using three different single-case designs.
- All three experiments showed increases in both staff and student performance.
Method

• Setting
  ○ Private ABA center in the Midwest
  ○ 1:1 student ratios for DTT
  ○ Small group for leisure and social skills training

• Participant Recruitment
  ○ 4 students with autism
    a) attendance at Center for at least six months at the onset of the study;
    b) participant in an ABA therapy program for at least one year; and
    c) chronological age of 13 years or younger.
  ○ 4 instructors
    a) no prior training in incidental teaching methods; and
    b) history with or currently teaching in a classroom with one of the student participants.
Participant Descriptions

- Students
  - Daniel- 12 yr old male; limited language, express wants/needs; challenging behaviors with demands
  - Sam- 7 yr old male; lacked conversational language and variety of speech, able to express wants/needs in short sentence; interested in others
  - Andy- 5 yr old male; previously non-verbal; strong verbal imitation, independent with 1-3 word utterance; poor attending & low motivation
  - Max- 13 yr old male; minimal vocal/sign language; imitate 3-4 words using sign, inconsistent with independent use; low motivation

- Instructors
  - Dylan- 20 something male; served in armed forces; HS diploma +40 hrs of training toward RBT
  - Abby- late 30s female; preschool teacher; BS degree +40 hrs of training toward RBT
  - Molly- 20 something female; HS diploma; new employee
  - Mary- 20 something female; HS diploma +40 hrs of training toward RBT; new employee
Experimental Design

- Single-case multiple baseline design across participants
  - A single behavior was be measured across multiple student participants, while a separate behavior chain was be measured across multiple instructor participants

- Experimental conditions: baseline, training of IT procedures (intervention), and generalization
Student Target Behaviors

- Daniel- full sentence +please (ex. “Can I have the blue truck, please?”)

- Sam- asking “where” (ex. “Where is Sponge Bob?”)

- Andy- using carrier phrases such as “I want” or “Can I have” (ex. “Can I have harmonica”)

- Max- pairing a vocal with sign; 1-3 words (ex. “eat yogurt” or “bounce ball”)

  - Based on individual ability levels
Instructor Target Behaviors

- Incidental Teaching Steps
  a) instructors stage environment with preferred & target items
  b) wait for student initiation
  c) blocks or denies access to requested item
  d) delivers appropriate prompt for elaboration
  e) re-prompt if the elaboration not met
  f) confirms request
  g) deliver reinforcement specific to initiation paired with praise (i.e. item, help, attention, etc.)
Incidental Teaching
Method

- **Data Collection**
  - **Students**
    - trial-by-trial format- (C) correct independent, (I) incorrect or nonfunctional, or (P) prompted
    - percentage of correct responses
  - **Instructors**
    - percentage of correct implementation-number of IT steps implemented correctly divided by total number of steps in IT procedure
Sample Student Data Sheet

Initiation: may I push
Elaboration: will you push me please
C I P

Initiation: will you push please
Elaboration: will you push me please
C I P

Initiation: will you push
Elaboration: will you push me please
C I P

Initiation: will you push please
Elaboration: n/a
C I P

Initiation: will you push
Elaboration: will you push me please
C I P

Initiation: will you push please
Elaboration: n/a
C I P

Initiation: will you push
Elaboration: will you push me please
C I P

Initiation: will you push please
Elaboration: n/a
C I P
## Sample Instructor Data Sheet

<table>
<thead>
<tr>
<th>Observer</th>
<th>HC</th>
<th>HC</th>
<th>HC</th>
<th>HC</th>
<th>HC</th>
<th>HC</th>
<th>HC</th>
<th>HC</th>
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<th>HC</th>
<th>HC</th>
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<th>HC</th>
<th>HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor</td>
<td>Blank</td>
<td>Blank</td>
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<td>Blank</td>
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<tr>
<td>Session</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Staging Environment</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Waiting for Initiation</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
</tr>
<tr>
<td>Block Access to Item</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Prompt for Elaboration</td>
<td>na</td>
<td>na</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Re-prompt (if needed)</td>
<td>na</td>
<td>na</td>
<td>+</td>
<td>+</td>
<td>na</td>
<td>+</td>
<td>na</td>
<td>na</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>na</td>
<td>na</td>
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<tr>
<td>Confirmation of Request</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Delivery of Reinforcement</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
Reliability

- Interobserver reliability for observational data will be calculated using the following formula:

\[
\frac{\text{Total number of agreements}}{\text{Total number of agreements} + \text{disagreements}} \times 100 = \text{Total % of Agreements}
\]

- Data collected 23% of sessions (27 sessions)

- Data found to be reliable
  - 94%-student initiations across sessions
  - 95%-instructor implementation of incidental teaching steps
Data Analysis

• Coding & transcription
  ○ Coding for IT sessions within 48 hrs of observation
    ▪ detailed feedback to instructor prior to next observation
  ○ Coding compared to determine correct coding
  ○ Student responses transcribed/coded to determine if elaboration was correct
  ○ Transcriptions reviewed and compared across observers

• Graphical Form
  ○ Percentage of correct incidental teaching episodes
  ○ Percentage of correct elaboration of language
Procedure

- **Initial Observations**
  - Students - 20 minutes to determine target responses
  - Instructors - 20 minutes - observed & questioned for knowledge of IT

- **Baseline**
  - 5-minute observation sessions
    - student initiations/language elaborations
    - instructor’s use of IT
  - No instructions or information provided to instructor
  - Differing length of Baseline (MBD)
    - Dylan and Daniel - 5 sessions, total 25 min
    - Abby and Sam - 7 sessions, total 35 min
    - Molly and Andy - 10 sessions, total 50 min
    - Mary and Max - 14 sessions, total 70 min
Procedure

- **Training in IT**
  - Conducted in classrooms at center
  - Video recorded
  - Instructors received one 1-hour individual training:
    1. read and reviewed IT steps
    2. answered and asked questions on IT procedure
    3. observed modeling of IT procedures in videos
    4. role played scenarios of IT procedures
    5. received feedback on implementation of IT during role play
      - Behavior specific praise for correct implementation of IT procedure, and specific corrective feedback for errors
Procedures

**IT Sessions**
- Reinforcer assessment
- Instruction given, “run an IT session”/start video recorder
- Video observation & data collection
- Expected Instructor Behavior:
  1. Instructor & student to instructional area/sit within 2 ft of material
  2. Instructor waited for initiation
  3. Upon initiation, retrieved & withheld item/prompt elaboration
  4. Upon elaboration, instructor delivered item with verbal praise
- Received specific praise/feedback, recommendations, and data
  - Instructed to view the video of sessions while reviewing feedback
Feedback Example

Areas of Strength:
• I like how you use a variety of activities in your sessions. I particularly liked the truck activity. Lots of opportunities for language and language is really sounding great!
• Your prompts are much more effective now that you have consistently stopped from speaking while you are.
• You’re doing an awesome job providing behavior specific praise (especially in videos 3–7)
• You do a great job holding to a higher standard by expecting fall, accurate sentences from him. You also hold out for independent responses, fantastic!
• I love how you differentially reinforce independent responses with more praise, claps, etc.
• Sessions 5–7 look amazing! You are consistently completing each step of the incidental teaching checklist in these sessions.

Areas to Focus on:
• You might want to watch giving prompts in a ‘sing song’ type voice, unless you want your students to respond that way.
• When you ask questions and doesn’t respond or errors, ask the question again and immediately prompt with the correct response. We need to try to limit the amount of times students practice errors/non-responding.
• I can’t understand some of the things that is requesting, but if he is requesting things that are unavailable you can say something like, “we aren’t going to do right now, but we can do____” and give him an option that is available.
• You began to revert back to asking “what do you want” and using non-specific praise in videos 6–9. Try to give only the language you want him to use, and provide behavior specific praise for appropriate responses.

For future sessions:
• I recommend to everyone that they watch their own videos as a type of self-monitoring/reflection. You may want to watch to see which things you are doing well, and if there are things that you personally want to improve upon in your teaching and interactions with your students.
• Some ideas for language building activities for DC are purchasing a snack from the snack machine at the gym, and playing a turn taking game (basketball, board game, etc.). It seems as though he needs a few more age appropriate activities.
Procedures

- **Generalization**
  - Identical to IT phase, took place in varying environments
    - New classroom
    - Lunch room
    - Leisure room
    - Center playground
    - YMCA
  
  - No specific feedback or training provided
  - Instructors continued to receive data from each session
# Social Validity

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Rating</th>
<th>Rating Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Given your student’s language capabilities, how acceptable do you find the incidental teaching method?</td>
<td>4.75</td>
<td>3-5</td>
</tr>
<tr>
<td>How willing are you to implement incidental teaching with your student(s) in the future?</td>
<td>4</td>
<td>3-5</td>
</tr>
<tr>
<td>To what extent do you think there might be disadvantages to this teaching procedure?</td>
<td>1.5</td>
<td>1-2</td>
</tr>
<tr>
<td>How confident are you that incidental teaching will be effective for your student(s)?</td>
<td>4.75</td>
<td>4-5</td>
</tr>
<tr>
<td>How likely is this teaching procedure to impact language development in all students?</td>
<td>4</td>
<td>3-5</td>
</tr>
<tr>
<td>How much do you like using the incidental teaching procedure?</td>
<td>4.25</td>
<td>3-5</td>
</tr>
<tr>
<td>To what extent are undesirable side effects likely to result from incidental teaching?</td>
<td>1.25</td>
<td>1-2</td>
</tr>
<tr>
<td>How willing would you be to change your daily routine to implement incidental teaching?</td>
<td>4.25</td>
<td>3-5</td>
</tr>
<tr>
<td>How disruptive will it be to daily routines to implement this teaching procedure?</td>
<td>1.4</td>
<td>1-2</td>
</tr>
<tr>
<td>How effective do you believe the teaching procedure will be in teaching your student’s appropriate language?</td>
<td>4.75</td>
<td>4-5</td>
</tr>
<tr>
<td>To what extent do you believe this teaching procedure is appropriate for all students?</td>
<td>4.25</td>
<td>3-5</td>
</tr>
<tr>
<td>To what extent do you believe that learning this teaching procedure enhanced your effectiveness as an instructor?</td>
<td>4.5</td>
<td>4-5</td>
</tr>
<tr>
<td>To what extent do you believe this procedure could be implemented across all environments (home, school, community)?</td>
<td>4.75</td>
<td>4-5</td>
</tr>
<tr>
<td>To what extent do you believe that this teaching procedure has enhanced the use of language in your student in all environments?</td>
<td>4.25</td>
<td>3-5</td>
</tr>
</tbody>
</table>
Procedural Fidelity

*Complete this checklist after receiving feedback from the researcher. For each section score (+) for accurately completed, or (-) for did not complete/inadequately completed. Did the researcher...

<table>
<thead>
<tr>
<th>Date</th>
<th>1. Provide you with positive feedback?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Provide data to demonstrate your teaching behavior?</td>
</tr>
<tr>
<td></td>
<td>3. Encourage appropriate use of incidental teaching?</td>
</tr>
<tr>
<td></td>
<td>4. Discuss missed opportunities for incidental teaching?</td>
</tr>
<tr>
<td></td>
<td>5. Allow time for questions?</td>
</tr>
<tr>
<td></td>
<td>6. Answer questions adequately?</td>
</tr>
<tr>
<td></td>
<td>7. Conduct herself in an appropriate and professional manner?</td>
</tr>
</tbody>
</table>

*Fidelity demonstrated at 100% across instructors 1-3
Results

- Research questions 1 & 2 - effects of training of IT in instructors and generalization of skills

- Increase in IT across all instructors
  - Baseline mean percentage correct at 37%.
  - Intervention mean increased to 67%.
  - Generalization mean was 90%
    - Skills maintained at higher level than Baseline
  - Experimental control demonstrated by change in behavior across instructors consistent with introduction of IV
Instructor Results

- **Dylan**
  - Baseline-47% (range=33%-50%)
  - Intervention-85% (range=82%-87%)
  - Generalization-97% (range=85%-100%)

- **Abby**
  - Baseline-48% (range=33%-50%)
  - Intervention-75% (range=54%-90%)
  - Generalization-80%

- **Molly**
  - Baseline-30% (range=17%-33%)
  - Intervention-50% (range=17%-100%),
  - Generalization-98% (range=95%-100%)

- **Mary**
  - Baseline-23% (range=17%-33%)
  - Intervention-57% (range=17%-100%)
  - Generalization-84%
Student Results

- Research question 3- student progress related to instructor performance.
  - Results show training of instructors in IT increased student language initiations

- Student Initiations
  - Baseline-mean 0%
  - Intervention-mean 26%
  - Generalization-mean 52%
  - Replication demonstrated across participants
Student Results

- Dylan
  - 0% at Baseline
  - Intervention-33% (range=0%-57%)
  - Generalization-67% (range=25%-100%)
  - Last days of Generalization-scores 82% & 100%
    - met criterion for mastery of his targeted response.
Student Results

Sam
- 0% at Baseline
- Intervention-36% (range=0%-100%)
  - Sessions 6-9 Abby did use IT, but did not target “where,” skewed scores
- Only one Generalization session-correct initiations 82%
Student Results

- Andy
  - 0% at Baseline
  - Intervention-30% (range=0%-71%)
    - Six sessions-no data, IT not used/carrier phrases not targeted
  - Generalization-58% (range=40%-75%)
Max
- 0% at Baseline
- Intervention-4% (range=0%-50%)
  - slight improvement one session of Intervention
- 0% during Generalization
- Sessions 20-22-no data, IT not used/target initiations not targeted
Discussion & Conclusions

- Improvement in IT following training for instructors, and increase in initiations in students with ASD (aligns with Ryan et al., 2008; Schepis et al., 2001).

- Feedback on IT sessions impacted instructor performance and as a result, student initiations. (aligns with Downs et al. (2007) and Parsons; Reid (1995))

- Results indicate strong connection between instructor training and student language progression

- Data as feedback to instructors contributed to increases in IT (aligns with Casey and McWilliam (2008); Tate et al. (2005))
Limitations

- Two instructors performance dropped back to baseline levels after progress was made
  - Participated in training for new staff members that took place during the study
  - Training on different teaching method that had goals differing from those of IT

- Difficulty with scheduling

- Limited time to “get to know” students & abilities
Recommendations

- More research needed on:
  1) Written/guided feedback
  2) Amount of feedback/supervision needed to maintain skills
  3) How student data impact teacher performance
  4) The extent to which student performance is impacted

- Instructors and students with ASD could benefit greatly from training in empirically validated teaching protocols such as IT
References