THE EFFECTS OF PARENT-IMPLEMENTED COMMUNICATION INTERVENTION ON TODDLERS WITH RECEPTIVE AND EXPRESSIVE LANGUAGE DELAYS

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Young Children with Language Impairment

- Language development is one of the strongest predictors of children’s long term academic and social outcomes.
- Young children with typical cognitive development but significant delays in language at age 2 may be at risk for later development.
  - About 60% of children with receptive delays and normal range cognition have typical language by age 7;
  - Only 25% of children with receptive and expressive delays have typical language outcomes (Law et al., 2000).
- In the absence of universal screening for language development, many pediatricians recommend wait and see rather than early intervention for this population.
Including Parents in Intervention for Young Children with Language Impairment

- Quantity and quality of linguistic input provided by parents impacts child language development (Hart & Risley, 1995; Smith, Landry, & Swank, 2000; Tamis-LeMonda, Bornstein, & Baumwell, 2001)

- Teaching parents is cost effective (Gibbard, 2004)

- Including parents facilitates generalization to everyday contexts (Kashinath, Woods & Goldstein, 2006)

- Parent-implemented interventions have relatively consistent effects for children with expressive language impairment (Roberts & Kaiser, 2011)
  - Children have on average 53 more words ($g = .38$)
A Cascading Intervention Model

How to Teach Parents?

Parent Training

Parent Use of Strategies

What to Teach Parents?

Child Language

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Maximizing Intervention Effects

Enhanced Milieu Teaching (EMT)
(Child Intervention)

- EMT is a widely studied intervention with consistently positive effects on various language forms and structures (Kaiser & Trent, 2007).
- Gains in language have been observed in children with intellectual disabilities:
  - Classes of language structures (Goldstein & Mousetis, 1989; Warren, Gazdag, Bambara, & Jones, 1994),
  - Global language development (Hancock & Kaiser, 2002; Kaiser et al., 2000).
EMT Principles and Strategies

1. **Promote adult-child communication now**
   - Notice and respond
   - Follow the child’s lead

2. **Increase child engagement with objects and activities**
   - Child preferred activities
   - Join the child in play and activity
   - Teach play and participation
   - Teach across play and routines

3. **Expand the social basis of communicative interactions**
   - Arrange environment to increase engagement
   - Teach joint attention strategies
   - Balance turns (mirror and map)
   - Increase person engagement

4. **Teach child communication target forms to advance language**
   - Respond
   - Model
   - Expand
   - Prompt

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Maximizing Intervention Effects

Parent Training

Parent Use of Strategies

Child Language

Teach-Model-Coach-Review Parent Training
(Parent Intervention)

- Based on 6 adult learning strategies (Dunst & Trivette, 2009).
- Simultaneous use of different methods has the largest effect ($d=1.25$).

<table>
<thead>
<tr>
<th>Coach</th>
<th>Coached the caregiver while she practiced the strategy with the child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review</td>
<td>Last 10 minutes of each session</td>
</tr>
<tr>
<td></td>
<td>- Discussed the session</td>
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<td>- Linked parent and child behaviors</td>
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<td></td>
<td>- Made a plan for home use of strategies</td>
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Caregiver Intervention (Teach-Model-Coach-Review)

Teach
4, 1-hour-long workshops:
• Defined strategy
• Provided rational
• Described how to do the strategy
• Showed video examples
• Answered questions
First 10 minutes of each intervention session
• Re-stated the strategy, gave example
• Role played
• Discussed ways to use the strategy

Model
15 minutes of each intervention session
• Modeled the language support strategy
• Highlighted strategy use

Coach
15 minutes of each intervention session
• Coached the caregiver while she practiced the strategy with the child

Feedback
Last 10 minutes of each intervention session
• Discussed the session
• Linked parent and child behaviors
• Made a plan for home use of strategies

Caregiver Dependent Variables
Child Intervention
(Use of EMT language support strategies)

Study Design

Matched turns  Percentage of adult turns that are in response to the child’s previous utterance
Responsiveness  Percentage of child turns to which the adult responds
Targets  Percentage of adult utterances that contain a child target
Expansions  Percentage of child utterances to which the adult adds a word
Time Delays  Number and percentage of episodes that include correctly executed steps of the nonverbal prompting hierarchy
Prompting  Number and percentage of episodes that include correctly executed steps of the verbal prompting hierarchy

Expressive Language Skills
Receptive Language Skills

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Fidelity of implementation checklists
20% of sessions

Observational coding from video
Therapist: 20% of sessions
Parent: before the introduction of a new strategy

PLS-4, EO WPVT-3, PPVT-4
NDW, MCDI
Research Questions

• Do parents in the treatment group use more EMT language support strategies than parents in the control group?
• Do children in the treatment group have better language skills than children in the control group?
• Does intervention reduce the number of children classified as having a language impairment?
Design

- Randomized controlled trial (NCT01975922)
  - Treatment n=45
  - Control n=43
- Children were assessed:
  - At the start of the study
  - Once a month during intervention
  - At the end of intervention
  - 6 months after intervention
  - 12 months after intervention
Participants

- **Age**
  - 24-42 months
  - mean age of 30 months
  - 83% boys

- **Race**
  - 80% White
  - 18% African American
  - 2% Other

- **Mother Education**
  - High school only: 40%
  - Undergraduate degree: 30%
  - Graduate degree: 26%

- **Cognitive Skills** (Bayley Scales of Infant Development)
  - 90 (SD 8)

  - Expressive language: 75 (SD 8)
  - Receptive language: 75 (SD 16)
Measures

- Preschool Language Scale – 4th Edition
- Peabody Picture Vocabulary Test – 4th Edition
- Expressive One Word Picture Vocabulary Test – 3rd Edition
- Number of different words in a 20 minute language sample
- Number of words said reported by the parent on the MacArthur Bates Communicative Inventories
- Lena Home Recordings (2 days at each assessment)
EMT Example
Parent + Therapist EMT

Enhanced Milieu
Teaching with a Toddler
Parent Use of EMT Strategies

Matched Turns: 74% (Intervention), 32% (Control) - d = 3.2
Responsiveness: 85% (Intervention), 80% (Control) - d = 0.7
Targets: 47% (Intervention), 3% (Control) - d = 2.0
Expansions: 42% (Intervention), 4% (Control) - d = 2.2
Time Delays: 42% (Intervention), 0% (Control) - d = 0.71
Prompting: 50% (Intervention), 3% (Control) - d = 0.92

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Parents Met Fidelity of Implementation Criteria

<table>
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<tr>
<th>Parent Use of EMT Strategies</th>
<th>Criteria</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matched turns</td>
<td>&gt;.75</td>
<td>.78 (.12)</td>
</tr>
<tr>
<td>Responsiveness to child verbal turns</td>
<td>&gt;.80</td>
<td>.92 (.05)</td>
</tr>
<tr>
<td>Talk at the child’s level</td>
<td>&gt;.50</td>
<td>.57 (.18)</td>
</tr>
<tr>
<td>Expansion of child’s utterances</td>
<td>&gt;.40</td>
<td>.46 (.11)</td>
</tr>
<tr>
<td>Time delay strategies</td>
<td>&gt;.80</td>
<td>.61 (.36)</td>
</tr>
<tr>
<td>Prompting strategies</td>
<td>&gt;.80</td>
<td>.82 (.24)</td>
</tr>
</tbody>
</table>
Child Norm-Referenced Outcomes

Expressive language (PLS-4) | Receptive language (PLS-4) | Expressive vocabulary (EOWPVT-3) | Receptive Vocabulary (PPVT-4)

Intervention: 84, 86, 76, 94
Control: 80, 77, 70, 86

Standard Score

$\Delta = 0.3$
Child Norm-Referenced Gains

Expressive language (PLS-4)  Receptive language (PLS-4)  Expressive vocabulary (EOWPVT-3)

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<th>Standard Score</th>
<th>Pre</th>
<th>Post</th>
</tr>
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<tbody>
<tr>
<td>Expressive language (PLS-4)</td>
<td>75</td>
<td>84</td>
</tr>
<tr>
<td>Receptive language (PLS-4)</td>
<td>77</td>
<td>86</td>
</tr>
<tr>
<td>Expressive vocabulary (EOWPVT-3)</td>
<td>61</td>
<td>76</td>
</tr>
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</table>
Child Number of Different Words

- Start: Treatment T: 264, Control C: 215
- Month 1: Treatment d = 0.2, Control d = 0.5
- Month 2: Treatment d = 0.5, Control d = 0.5
- Month 3: Treatment d = 0.5, Control d = 0.5

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Growth in Child Vocalizations Over Time

**Canonical Syllable per Turn**

- Community Group Average
- Intervention Group Average
- Community Individual
- Intervention Individual

**Ratio of Child Vocalization to Adult**

- Community Group Average
- Intervention Group Average
- Community Individual
- Intervention Individual

Group Difference of Slope:
Reduction of Language Delays

Children with scores in the average range on the PLS-4

Odds ratio: 2.391 (.98, 5.82) p = .05
Relative risk = 1.40 (.99, 1.97)
Implications for Practice

- Parent plus therapist model provide efficient and effective early intervention
  - 28 sessions; less than 30 hours of intervention/training
- High quality parent training can positively impact children’s language development
  - Parents learned strategies to fidelity
  - Used the strategies across the day, taught others
- Training parents at fidelity requires early interventionist preparation
  - Teach-Model-Coach- Reflect
  - Monitoring fidelity
Implications for Policy

- Screening children at age 2 can identify children for whom language impairment is likely to persist
  - 65% of control group had persistent language impairment
  - Bayley cognitive score and receptive language (PLS-AC) predicted child language outcomes (66% of variance)
- “Wait and See” may not be the best policy
- Improve access to early intervention for children with receptive and expressive language delays
Acknowledgments

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This talk will be posted at

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