Research and Clinical Expertise related to parental involvement in home visits

Evidence and Practice related to parental involvement in home visits

Agenda

- Introduction - ASHA Guidelines & Evidence Based Practice
- Research Evidence
  - Systematic Review results
  - What is happening during home visits
- Expertise and Practice based evidence
- More than 5 ideas for implementation
- Discussion/Q&A
Introduction

- ASHA Guidelines for Early Intervention include
  - Family centered, culturally and linguistically responsive
  - Developmentally supportive and promote children’s participation in their natural environments
  - Comprehensive, coordinated and team based (including family and professionals)
  - Based on the highest quality of evidence that is available

Evidence-based Practice (Overview)

Evidence-based Practice (Overview)

Purpose of review

- Identify what strategies were found to be effective with late talking toddlers
- Synthesis and critical appraisal of the existing experimental research literature on Birth-3 speech and language intervention
What is a Systematic Review?

A Systematic Review is
“The application of procedures that limit bias in the assembly, critical appraisal, and synthesis of all relevant studies on a particular topic. Meta-analysis may be but is not necessarily part of the process” (Chalmers et al. 2002).

- Adopted by many fields (e.g., medical and allied health sciences, education, psychology, etc.) to document evidence-based practices.
- Used to synthesize research findings and evaluate the effectiveness of treatments or accuracy of diagnostic tools.

Advantages of a Systematic Review

- Quantitative evaluation of study outcomes and study characteristics.
- Quality appraisal of study methodology.
- Systematic reviews provide practitioners with pre-filtered evidence (Guyatt & Rennie, 2002).

Literature Search

- **Study Sources:** Cumulative Index of Nursing and Allied Health Literatures [CINAHL], Education Resources Information Center [ERIC], Language and Linguistics Behavior Abstracts [LLBA], Medline, PsycINFO, and ProQuest Digital Dissertations [PQDD], Cochrane Central Register of Controlled Trials, Google Scholar, Scirus, SCOPUS, Science Direct, and the American Speech-Language-Hearing Association Conference Proceedings.

Study Inclusion Criteria

- Participants exhibit delay of at least 1 SD below the mean on standardized test or present with official history of language delay.
- Participants are between the ages of 0 and 36 months.
- Participants do not have a diagnosis of cognitive, sensory or motor disorders (including autism spectrum disorders, PDD or other developmental disorders).
- Participants’ do not need amplification for language learning.
- Participants are not labeled as bilingual learners of language.
- Study is a treatment or intervention study. Intervention is defined as “a superordinate concept for the different intentional steps taken to change a person’s skills, behavior, attitudes [added by the authors], interaction, events or environments in a desired direction” (Granlund & Björck-Åkesson, 2004). The study may evaluate one treatment or compare two or more treatments.

Study Inclusion Criteria (continued)

- Focused on remediating speech or language delay (both pre-linguistic and linguistic variables); Recipients of treatment are children, parents or other caregivers may also be present and given information regarding treatment.
- The treatment does not use graphic symbols as a sole means of communication (such as early phases of PECS).
- Employs a (quasi-)experimental design for evaluating the effectiveness or efficiency of a treatment.
- The experiment is written as an article in a refereed journal, a book chapter, or a document made available through the ERIC; or it appears in published conference proceedings or as an unpublished Master’s thesis or doctoral dissertation.
- The experiment is dated between 1980 and December 2010 (including those that are published on-line first).

Data Evaluation:

Group Experimental Designs

- Effect sizes for group data
  - Cohen’s d and Hedges g (range -3.00 to 3.00)
    - < .20: small effect
    - .20 - .50: medium effect
    - .50 - .80: important effect
    - > .80: large effect/major difference (Cohen, 1977, 1988)
  - Pearson’s r (range -1.00 to 1.00) for non-parametric statistics
    - ≤ .1: small effect
    - .1 - .3: medium effect
    - ≥ .3: large effect (Cohen, 1988, 1992)
Data Evaluation:
Single-subject Experimental Designs

- Effect size estimates for single-subject data
  - Percentage of Nonoverlapping Data (PND)
    - (Scruggs, Mastropieri, & Casto, 1987)
    - Calculation of non-overlap between baseline and successive intervention phases
  - PND range 0-100%
    - PND < 50% reflects unreliable treatment
    - PND 50% - 70% questionable effectiveness
    - PND 70% - 90% fairly effective
    - PND > 90% highly effective
    - (Scruggs, Mastropieri, Cook, & Escobar, 1986)

Quality Appraisal

- Assessment of methodological quality
  - Certainty of evidence (Simeonsson & Bailey, 1991)
    - Mainly an appraisal of internal validity
    - Based on three dimensions: (a) research design, (b) interobserver agreement of dependent variable, and (c) treatment integrity
    - Conclusive, preponderant, suggestive, inconclusive

  IMPORTANT:
  - Only evidence evaluated as being suggestive or better should be considered re: implications for practice
  - Inconclusive studies are not appropriate for informing practice due to their fatal design flaws! They may be considered only in terms of directions for future research.

Reliability

- Inter-rater reliability on study inclusion/exclusion
  - 97%, Cohen’s kappa = .75
- Inter-rater reliability on study coding
  - r=1.00 (p<.001) for continuous variables
  - >80% for categorical variables
Results

- Total number of articles found: 9640
- Total number of articles that remained after initial abstract review: 224
- Total articles included in the systematic review: 11
- Results are organized:
  - Outcomes of studies focusing on techniques
  - Outcomes of studies focusing on interventions

Speech and Language Facilitation Techniques vs Interventions

Techniques – Strategies used by a speech-language pathologist or an caregiver to facilitate a response from a child

Interventions - Defined as a set of techniques or strategies combined together in a program regiment

Speech and Language Facilitation Techniques - Examples

- **Modeling**: provide examples of the desired speech or language targets
- **Expansion**: take the child's utterances and add the appropriate grammatical markers or semantic details
- **Self talk**: pair the language with what the adult is doing
- **Parallel talk**: provide the language for what the child is doing
- **Child-directed speech**
  - Short, simple utterances
  - Exaggerated intonation
  - Repetition
  - Slow rate
- **Gestures/signs/visual cues**
- **Recasting**: say back the child's utterance by taking the original message and change it into an adult-like utterance
Speech and Language Facilitation Techniques - Evidence

- Modeling - (Weismer, Branch & Miller, 1993)
  - 3 children who were 27-28 months old with receptive and expressive language delays
  - Goal of the study was to increase children’s speech and language output

- Outcome - increase in number of single words, but results were mixed
  - Late Talker 1 Modeling: 100% (PND; highly effective), Modeling with Evoked Production: 63% (highly effective)
  - Late Talker 2 M: 33% (unreliable treatment); MEP: 12% (unreliable treatment)
  - Late Talker 3 M: 38% (unreliable treatment), MEP: 100 % (highly effective)
  - Preponderant, IOA reported, 15% TI reported, design details reported, no treatment effect observed

Reminder about quality appraisal

- Conclusive – Speech and language outcomes were undoubtedly result of the intervention. Includes IOA, TI and sound research design
- Preponderant – Outcomes are likely to have occurred as a result of intervention. Strong design with minor flaws (related to IOA, TI)
- Suggestive – Plausible that outcomes are related to intervention. Missing or flawed IOA or TI and minor design flaws
- Inconclusive – No conclusions about the intervention outcomes is possible. Major design flaws, missing IOA and TI
Speech and Language Facilitation Techniques - Evidence (continued)

- Expansion, recasting, parallel talk, child-directed speech, and visual cues combined (Robertson & Weismer, 1999)
- 21 children between 21 and 30 months with expressive and receptive language delays
- Goal – to increase speech and language output and social competence

Speech and Language Facilitation Techniques - Evidence (continued)

- Outcomes –
  - Increase in number of single words and word combinations: MLU: \( d = 0.90 \) (high effect); TNW: \( d = 1.08 \) (high effect); NDW: \( d = 1.21 \) (high effect)
  - Increase in percentage of intelligible utterances, \( d = 1.62 \) (high effect)
- Preponderant: High IDA, however observer not blind, 5% TI calculated, however neither independent nor blind, design details reported

Currently Used Speech and Language Interventions

- Defined as a set of intervention techniques or strategies combined together in a program regimen
- Interventions from our search included:
  - Hanen Program (with Focused Stimulation)
  - Video-Based Parent Training Programs
  - Milieu or Prelinguistic Milieu Teaching
  - Other Parent Training Programs
Hanen Program
- Hanen Program (Girolametto, Pearce and Weitzman, 1996) with Focused Stimulation (Leonard, 1981)
  - Child-directed, indirect approach
  - Parent training provided by SLPs
  - Parent implements intervention at home with child
  - Videotaping of interaction between parent and child is carried out to analyze use of strategies and problem solving

Hanen Program
- Techniques used in the Hanen Program
  - Expansion
  - Repetition
  - Parallel talk
  - Self talk
- Combined with Focused Stimulation
  - Modeling
  - Repetition
  - Melodic Intonation

Hanen Program - Evidence
- Girolametto, Pearce & Weitzman (1996)
  - 22 children between 23 and 33 months of age with expressive and receptive language delays
  - Goal – increase parent participation and increase child’s language output
Hanen Program- Evidence

• Girolametto, Pearce & Weitzman (1996)
  • Outcomes –
    • Increase in number of words and word combinations- Vocabulary size: $d = 0.76$ (important effect)
    • Increased parental frequency of use of techniques- Parental words per minute: $d = 0.03$ (small effect)
  • Conclusive: TI and IDA reported, strong design, RCT

Hanen Program- Evidence (continued)

• Girolametto, Pearce & Weitzman (1997)
  • 25 children between 23 and 33 months of age with expressive and receptive language delays
  • Goal – increase child’s speech output

Hanen Program- Evidence (continued)

• Outcomes –
  • Increased phonetic (consonant) inventories- early $d = 1.06$ (high effect), middle $d = 1.22$ (high effect), late $d = 0.62$ (important effect)
  • Syllable structure levels: $d = 0.94$ (high effect; 2 or more consonants per syllable)
  • Conclusive – TI and IDA reported, strong design
Hanen Program: Evidence (continued)
  - 17 children between 24 and 31 months of age, expressive language delay
  - Goal – increase children's language skills

Hanen Program: Evidence (continued)
  - Moller, Probst & Hess (2008)
  - Outcome – increase in language output
    - Productive Vocabulary: \( d = .52 \) (important effect)
    - Syntax: \( d = .54 \) (important effect)
  - Inconclusive – missing IDA and TI, design flaws

Video-Based Parent Training Programs: Evidence
  - 12 children, 26 to 34 months of age with expressive language delays
  - Goal – increase child's speech and language output and increased semantic networking
  - Techniques – Parent training based on Hanen, child directed speech, models
Video-Based Parent Training Programs - Evidence

Subramanian, Anu (2013)
ISHA Convention, Indianapolis, IN

Video-Based Parent Training Programs
Evidence

Siegmueller & Froehling (2003)

- Vocabulary: Treatment vs Control at T2: r = .60 (large effect size);
Treatment T1 to T2: r = .83 (large effect); Control T1 to T2: r = .22
(small effect); Achievement Diff. Treat vs Contr : r = .83 (large effect)

- Semantics: Treatment vs Control at T2: r = .55 (large effect size);
Treatment T1 to T2: r = .83 (large effect size); Control T1 to T2: r = .25 (small effect); Achievement Diff. Treat vs Contr : r = .83 (large effect)

- Inconclusive – missing TI and IOA, good design, small N \(\rightarrow\) likely low power

van Balkom, Verhoeven, van Weerdenburg, Stoep (2010)

- 22 children, 26 to 37 months with receptive & expressive language delays
- Goal- Increase child’s language (expressive and receptive)
- Techniques- PVHT (Parent Video Home Training)

Outcomes:

- No significant differences between groups at each treatment point
- No significant changes with language comprehension: Time2-Time1: r=.02 (small effect); Time3-Time2: r = .37 (medium effect)
- Improvements in MLU: T2-T1: r = .49 (medium effect) ; T3-T2: r = .45 (medium effect)
- Increased conversational coherence reported (not defined)

- Suggestive- No IOA or TI reported, good design, treatment described
Milieu Teaching (Warren, 1991)

- Language is embedded in interactions
- Multiple naturally occurring examples are used to input language.
- Uses prompting, request for imitation to elicit a response
- Adult manipulates materials to create opportunities to increase requests
- Adult models language that child imitates to receive stimulus material

Milieu Teaching- Evidence

- Ward (1999)
  - 119 children between 8 and 21 months with generalized listening difficulties, no functional speech
  - Goal – increase child's language output
  - Technique – parent training in child-directed speech, milieu teaching with focus on input only, speech perception training (playing with noisemakers, attending to the source of sound)

Milieu Teaching- Evidence

- Ward (1999)
  - Outcome – Increase in scores on Reynell Developmental Language Scales
    - Group 1 (receptive & expressive delays and listening difficulties): Expressive Language: $d = 2.1$ (large effect); Receptive Language: $d = 2.04$ (large effect)
    - Group 2 (receptive & expressive delays): Expressive Language: $d = 2.11$ (large effect); Receptive Language: $d = 1.83$ (large effect)
  - Inconclusive – missing IOA and TI, weak design
**Milieu Teaching - Evidence**

  - 94 children (lots of attrition), mean age of 27.95 with emerging single words
  - Goal – increase child’s language output
  - Technique – expansion, extension and prelinguistic milieu teaching

**Outcome** – increase in expressive vocabulary scores: \( d = .806 \) (important effect) for one-word – PPVT at 34 month post-test

**Inconclusive** – No TI or IOA calculated, limited information about design

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**Parent Training Programs - Evidence**

- Gibbard, Coglan & McDonald (2008)
  - 22 children between 22 and 32 months of age with expressive and receptive language delays
  - Goals – increase in language output
  - Technique – non-specific parent based
Parent Training Programs - Evidence

- Gibbard, Coglan & McDonald (2004)
  - Outcome – increase in single words and word combinations
    - Vocabulary: $d = 0.84$ (large effect)
    - Phrase length: $d = 1.97$ (large effect)
    - MLU: $d = 2.06$ (large effect)
    - PLS(E): $d = 1.39$ (large effect)
  - Inconclusive – Missing IOA, TI and limited design details

- Buschmann, Joss, Rupp, Feldhusen, Pietz & Philipp (2009)
  - 47 children between 24 and 27 months of age with expressive language delays
  - Goal – Increase child’s language output
  - Techniques – Parent training on child-directed speech and modeling
  - Outcomes –
    - Increase in vocabulary: Post-test $d = 0.72$ (important effect); Follow-up: $d = 0.74$ (important effect)
    - Expressive syntax: Post-test $d = 1.16$ (large effect); Follow-up: $d = 0.56$ (important effect)
    - Sentence productions: Post-test $d = 1.03$ (large effect)
    - Morphology: Post-test $d = 0.72$ (important effect); Follow-up: $d = 0.71$ (important effect)
  - Inconclusive – Missing IOA and TI, intervention details vague
Result Summary

- Conclusive studies related to Hanen
- Preponderant studies used expansion, recasting, parallel talk, child-directed speech, visual cues, feedback, and modeling
- Inconclusive studies that used other forms of parent training
- Caveat — problems with design, TI, or IOA, mismatch with reported results
- Studies that compare parent training to direct intervention indicate that parent training is a better technique, but contain study design flaws

<table>
<thead>
<tr>
<th>Study</th>
<th>Type of Intervention</th>
<th>Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girolametto, Pearce &amp; Weitzman (1996)</td>
<td>Hanen with Focused Stimulation</td>
<td>Conclusive; TI, IOA reported, treatment and design details present.</td>
</tr>
<tr>
<td>Girolametto, Pearce, &amp; Weitzman (2002)</td>
<td>Hanen with Focused Stimulation</td>
<td>Conclusive; Design details reported, TI reported, high IOA.</td>
</tr>
<tr>
<td>Robertson &amp; Wenger (2000)</td>
<td>Expansion, recasting, parallel talk, child-directed speech, visual cues, feedback, increasing interaction opportunities</td>
<td>Preponderant; High IOA, however observer not blind, 5% TI calculated.</td>
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<td>van Balkom, Verhoeven, van Weerdenburg, Stoep (2010)</td>
<td>Modeling in Modeling and Avoided Production</td>
<td>Preponderant; IOA reported, no TI reported.</td>
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<td>Preponderant; IOA reported, 15% TI reported.</td>
</tr>
<tr>
<td>van Balkom, Verhoeven, van Weerdenburg, Stoep (2010)</td>
<td>Modeling in Modeling and Avoided Production</td>
<td>Suggestive; No IOA or TI reported.</td>
</tr>
<tr>
<td>Siegmuller, Hornik (2004)</td>
<td>Child-directed speech, models provided</td>
<td>Inconclusive; Proper design, but small N results in lack of power.</td>
</tr>
<tr>
<td>Ward (1999)</td>
<td>Prelinguistic milieu teaching</td>
<td>Inconclusive; No TI or IOA calculated.</td>
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What Does This Mean?

- Gold standards = parent training (especially, Hanen with focused stimulation) or a variety of techniques together
- Urgent need for better studies that control for biases, operationally defining the outcome measures, rigorous treatment integrity, and stronger designs
General Strategies for Teaching Caregivers

Intervention Strategies to use with their children

- Provider demonstration with verbal narratives/explanations
  - Caregiver works directly with the child and provider gives feedback or suggestions
  - Provider demonstration-caregiver practice
  - Provider and caregiver share/discuss information
  - Provider and caregiver identify problem areas and jointly consider strategies

Types of Feedback Provider May Use

- Reinforcing
- Commenting
- Hypothesizing
- Reframing
- Summarizing
- Expanding
- Scaffolding

So – What goes on during early intervention sessions?

- A series of 4 studies conducted over a 6 year time frame
  - Primary Objective: To understand what interdisciplinary providers (PT, OT, SLP, Teachers) do during their home-based early intervention sessions: Do they focus on parents?
    - Do they focus on the children?
    - Do they focus on parents and children?
    - Are they activity/routine based?
    - Do they teach caregivers?

Wilcox, 2012
DATASET

- Subset of families, home visitors, and children from a larger study of early intervention effectiveness
- Video recordings of home visits of IDEA Part C Providers and Early Head Start Providers
- Recordings obtained over a 12 month period at 3 observation points separated by 6 month intervals
- Duration of home visits ranged from 25 – 92 minutes

Wilcox, 2012

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Results from Wilcox, 2012

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‘Experts’

- Clinician scientists versus clinician technicians
- Who is the expert
- Practice Based Evidence
Difference between RCT and Practice Based Evidence

<table>
<thead>
<tr>
<th>Variable</th>
<th>RCT</th>
<th>PBE-CPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>Stricter inclusion guidelines – 10 to 15% of real world</td>
<td>Everyone included, but know about individual differences</td>
</tr>
<tr>
<td>Process</td>
<td>Standardized treatment</td>
<td>Standardized data collection</td>
</tr>
<tr>
<td>Outcome</td>
<td>Specific (single) outcome</td>
<td>Many outcomes</td>
</tr>
<tr>
<td>Result</td>
<td>Efficacy</td>
<td>Effectiveness</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>Single, a priori</td>
<td>Multiple, additions during post-hoc</td>
</tr>
<tr>
<td>Confounders</td>
<td>Avoid them</td>
<td>Include them, document</td>
</tr>
</tbody>
</table>

Bernstein Ratner, 2010

Parent and family involvement

- Long-term process
- Involvement of all stakeholders
- Systemic changes
- Contracting with families
- Options for parent interaction/involvement
- Variations to the theme
- Using the ‘State’/‘Billing’ as your ally

Questions ???

• Long-term process
• Involvement of all stakeholders
• Systemic changes
• Contracting with families
• Options for parent interaction/involvement
• Variations to the theme
• Using the ‘State’/‘Billing’ as your ally
Contact Information
• Anu Subramanian, Ph.D., CCC-SLP
E-mail: subramaa@purdue.edu

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References