Evidence-Based Practice for Supporting Grammar Intervention in Children
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Disclosure Slide
- I am an Associate Professor at the University of Delaware
- I receive salary support from grants awarded to UD from NSF and NIH
- I am receiving travel support and an honorarium for this presentation.
- I am a founder and contributor to ODeardMMe.org

Learning Objectives
Describe the dose, rate, and intensity required for recast therapy to be effective.

Explain strategies for enhancing recast efficacy

Identify methods for supporting caregivers and teachers in the provision of models and recasts

A roadmap
- What is recast therapy
- Recast therapy as a treatment approach
  - Why it works
  - What makes it most effective
  - Barriers to effectiveness
- Making recast therapy more accessible
- Alternative approaches

Recasting ~ Procedure
Platform Utterance
- Child produces a relevant utterance
- Utterance may be correct or incorrect

Recast
- Adult restates the utterance using the target form (correction or expansion)
Recasting ~ Procedure

- Adult tries to get child to produce a relevant utterance
- Holds in mind the target
- Carefully structured context to support elicitation

Platform Utterance

- Child produces a relevant utterance
- Utterance may be correct or incorrect

Recast

- Adult restates the utterance using the target form (correction or expansion)

Look the girl is driving. She is driving fast.
What about this boy?
Is the boy running or walking?
Yes, HE IS running!

Conversational Recasting ~ Types

Adult restates the child’s utterance, while maintaining its meaning and core structure

- Corrective Recast
  - Him running → He is running
- Noncorrective recast
  - He is running → He ran
- Adding new information (expansions)
  - He is running → He is running to the swings

What is the rationale behind recasts?
Recasting ~ Rationale

- Concentrated Systematic Input
- Prior Activation
- Reduced Working Memory Demands
- Comparison & Storage
- Reduced Social Demands
- Improved Generalization

Recasting ~ Rationale

- Concentrated Systematic Input
  - Lots of sentences of the same type are said in a short period of time
  - Models of the sentence type are likely also said
  - Context should support linking form to meaning
  - Increases the salience of the target
  - Statistical learning maximizes acquisition of this content

Recasting ~ Rationale

- Prior Activation
- Reduced Working Memory Demands
  - The child has already brought semantic & syntactic elements to light
  - All the relevant components have been activated
  - New elements are more easily processed/noticed because other elements are already active

Recasting ~ Rationale

- Comparison & Storage
  - The correct utterance and the errored utterance are heard in close proximity to each other
  - Saxton says that the child interprets the recast as a correction
  - This correction can then be compared to the original
  - Differences are noted and the representation can be updated

Recasting ~ Rationale

- Reduced Social Demands
  - No specific production demand is being placed on the child
  - Instead of worrying about what to say next they can process & store the model
  - More natural than drill based therapy

Recasting ~ Rationale

- Improved Generalization to Natural Language
  - Because therapy is happening within a functional conversational setting there is no need to plan for generalization
  - Generalization of learning is already happening here
  - Camarata et al (1994) - Conversational recasts were better than elicited imitation at promoting spontaneous use. But elicited imitation promoted earlier first use
What is the evidence that supports the use of recasts?

Cleave, Becker, Curran, Owen Van Horne, & Fey 2015

Systematic Review and Meta-analysis
Available from AJSLP with supplemental materials w/ ASHA membership
Reviewed studies of recasts & focused stimulation from 1973-2012

- Feasibility Studies: 14
- Early Efficacy Studies: 13
- Late Efficacy Studies: 10
- Effectiveness Studies: 4

Forest plot of Early Efficacy studies.

Forest plot of Later Efficacy/Effectiveness studies

Hedge’s G = .7 - 1.0
Large effect
Change of
- .7 - 1.0

Auxiliary BE
Am (‘m), Is (‘s), Are (‘re)

Use toys to focus on actions. A set of objects and parallel form can help:

- Look the horse is eating hay. The pig is sleeping. (Hands the child the cow in hopes the child will describe the cow’s actions)
- Here are some bunnies. (Points the bunnies hop to a spot with food). The bunnies are hopping... (Hands child the bunnies...)
- Here comes the farmer. He is driving the tractor. And look at the horse. (Show a horse pulling a wagon. Prompt... what about him?...)

Systematic Review Findings

- Parents, Teachers, Clinicians are all effective providers
- Treats many different language targets
  - Verb Morphology
  - Simple Syntax
  - Questions
  - Complex Syntax
- Effective regardless of etiology

Third Person Singular –s

Talk about things people always do or do routinely in a situation

Let’s play grocery story.
Everyday the owner opens the store...
This girl puts the oranges in a pile...
The truck driver unloads the truck...
Complex Syntax

Why did the kite go up?
Because the wind blew.
The kite went up because the wind blew.

The fan blew. The bubbles go fast.
The bubbles went fast because the fan blew.

How is the fan like the wind?
The fan and wind blow. The fan is like the wind because they both blow.

Enhancing Recast Therapy ~ Evidence Worth Highlighting & Some New Stuff Since 2012

Enhancing Recast Therapy

- Get The Dose Up
  - 600-1200 exposures to a target
  - One Target At a Time
  - Kids Learn Best With Focused Stimulation

- Pick Hard Verbs
  - Making the input DIFFERENT can promote generalization & rule learning

- Variety matters

- At least 24 DIFFERENT Verbs

- Attention Matters

- Set Goals based on Preceptor Skills

- Add Auditory Bombardment — Maybe?

- Be Simple, But Be Grammatical

Get the Dose Up!

- Studies that were effective in the Systematic Review/MetaAnalysis had

  - 1-2 hrs of treatment per week
  - Therapy was spread over 10 weeks or more
  - Recast rates of .7-1.0 recasts per minute

MINIMUM: .7 recasts/min * 60 min * 10 weeks = 420 recasts

MAJORITY: 1 recast/min * 120 min * 10 weeks = 1200 recasts

MAXIMUM: 1 recast/min * 120 min * 20 weeks = 2400 recasts

Get the Dose Up!

Total dose administered over 4 therapy durations for 4 different recast rates

- 10 minutes
- 10 hours
- 20 hours
- 40 hours

Cumulative Recasts Administered

0 100 200 300 400 500 600 700 800 900 1000

1/2 min 1/2 mins 1/2 hrs 2/4 hrs 1/2 hrs 1/2 mins
One Target at a Time

- Focused Stimulation Leads to Larger Gains than General Stimulation
- Pick one morpheme (e.g., third person -s or auxiliaries) and get focused

<table>
<thead>
<tr>
<th>Testing Inflected S</th>
<th>Testing Auxiliaries Is, Are, Was</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 3</td>
<td>Time 4</td>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 3</td>
<td>Time 4</td>
</tr>
<tr>
<td>35 children</td>
<td>2.13 (1.96)</td>
<td>2.01 (1.84)</td>
<td>2.00 (1.80)</td>
<td>4.00 (1.96)</td>
<td>2.01 (1.84)</td>
<td>2.00 (1.80)</td>
<td>4.00 (1.96)</td>
</tr>
<tr>
<td>AUX division</td>
<td>2.34 (3.97)</td>
<td>2.33 (3.97)</td>
<td>2.33 (3.97)</td>
<td>4.00 (1.96)</td>
<td>2.33 (3.97)</td>
<td>2.33 (3.97)</td>
<td>4.00 (1.96)</td>
</tr>
<tr>
<td>55 children</td>
<td>2.10 (3.90)</td>
<td>2.05 (3.95)</td>
<td>2.05 (3.95)</td>
<td>4.00 (1.96)</td>
<td>2.05 (3.95)</td>
<td>2.05 (3.95)</td>
<td>4.00 (1.96)</td>
</tr>
</tbody>
</table>

Leonard, Camarata, Pawlowska, Brown, & Camarata, 2008

Pick Verbs Carefully

- Ranked easy to hard based on predicted accuracy
- Frequency of Stem, Tense, Lemma Frequency, Telicity
- Verb Final Phonology

- Owen Van Hoven & Green-Fager, 2015

Pick Verbs Carefully

- Interventions Fidelity forEach Intervention Component
- Number of Recasts

Pick Verbs Carefully

- Verbs Correctly Inflected in Probes Planned Comparisons
- Gap Flat

Variety is the Spice of Life

- Vary the verb used in a stable sentence frame with a stable morpheme
  - Runs, jumps, plays, hops, colors, walks, rolls, cats, hides...
- Vary the nouns linked to a helping verb or combined with the copula
  - The girl’s, the boy’s, the toy’s, the book’s, the table’s…
- Variety also supports word learning and other forms of learning

Variety is the Spice of Life

- 12 vs. 24 exemplars
Vocabulary Instruction

- Teach kids with small vocabularies (<10 words) new words
- Half the kids will learn 12 new words via very similar exemplars
- Half the kids will learn 12 new words via different exemplars
- Measure if kids learn target words (they do)

Track word learning over time

Parents complete MacArthur-Bates CDI weekly

- Similar (Tight) Exemplars
- Variable Exemplars


Attention Matters

- Ensure you have the child’s full attention before you start:
  - Touch the child, catch their eye, etc.
- Restate Right Away

Meyers Denmen & Plante, 2016; Plante et al. 2014, 2018

Set Goals Based on Precursor Skills

- Kids make more progress if they already know a little bit

- Progress on Auxiliary -ty/-ane
  - Used plural spontaneously
  - Combine SV routinely

- Progress on Adverbial Clause
  - Producing single clause causals in response to questions
  - Produce the conjunction (because, so) spontaneously

Hassink & Leonard, 2010
Curran & Owen Van Horne, 2019

Auditory Bombardment ~ Maybe?

- Auditory Bombardment was COMBINED with Enhanced Recast Therapy
- If you DO Auditory Bombardment, do it at the end.

Be Simple, but Be Grammatical

- Children only use grammatical markers when they are included in the input

- Bredin-Qua & Fey (2014) show that imitation of content words doesn’t vary if you add function words to utterances

- Venker et al (2015) suggest that use of telegraphic speech reduces vocabulary learning in children with ASD over time

- Loring, Venker, & Sterling (2009) suggest that telegraphic input is detrimental to language growth in children with Down Syndrome.
Be Simple, but Be Grammatical

<table>
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<tr>
<th>Types of Simplified Input</th>
<th>Complex Simplified Input</th>
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<tbody>
<tr>
<td>Simple</td>
<td>More</td>
</tr>
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</table>

- More vs. Few
- Some vs. None

Enhancing Recast Therapy

- Get The Teen Up
- Do 100-1300 exposures to a target
- One Target At A Time
- Kids learn best with focused training
- Pick target words
- Making the input DIFFERENT can promote generalization & rule learning
- Variety is the Spice of Life
- At least 14 different verbs
- Attention Matters
- Set Goals based on Procedural Skills
- Add Auditory Reinforcement - Maybe?
- Be Simple, But Be Grammatical

Recasts in Practice

Finestack & Satterlund, 2018

- Surveyed 338 SLPs who work with children about their intervention practices
- Asked about all aspects of the framework here

Table 5 - Finestack & Satterlund, 2018

<table>
<thead>
<tr>
<th>Intervention Component</th>
<th>Early Education (n = 114)</th>
<th>Elementary (n = 224)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proc.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Models</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Recasts</td>
<td>2%</td>
<td>21%</td>
</tr>
<tr>
<td>Requests for liaison</td>
<td>0%</td>
<td>25%</td>
</tr>
<tr>
<td>Explicit presentations</td>
<td>4%</td>
<td>31%</td>
</tr>
<tr>
<td>Other</td>
<td>&lt; 1%</td>
<td>&lt; 1%</td>
</tr>
</tbody>
</table>

TELL Lab Dose Survey

136 SLPs - 4 cases, varied in severity
Half in public schools/Half in EI/ECE settings

1. Which of the following treatment delivery methods would you use:
   a. Indirect - Parent Coaching
   b. Indirect - Teacher Consultation
   c. Push-in - Clinician Delivered
   d. Pull-out - Clinician Delivered
   e. Not eligible for services in my setting

2. How much of _____ would you provide for this case?
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<tr>
<td>Agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>1%</td>
<td>23%</td>
</tr>
<tr>
<td>Teacher</td>
<td>31%</td>
<td>36%</td>
</tr>
<tr>
<td>Other caregiver</td>
<td>15%</td>
<td>50%</td>
</tr>
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Effective Parent Training

Most Studies include
- Upper middle class families
- Stay at home parents
- 10-20 hours of direct instruction + coaching
- Ongoing parental support

→ Can we generalize to all families?
→ Are we providing enough support?

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Effective Teacher Coaching

Yoon et al. (2007). MetaAnalysis of Professional Development Practices sponsored by RES-Southwest/IES

To take up a practice enough that behavior changes enough to benefit children:
- 14+ hours of professional development
- Follow-up coaching to support integration into practice

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Brino & Melamed 2017; Courtney, 2018

Surveyed Preservice SLPs & teachers, Practicing SLPs

Difficulty with:
- Meta-linguistic awareness
- Ability to identify and manipulate grammatical targets
- Explicit knowledge of grammatical forms

Recasts in Practice
- Recasts show good efficacy in the lab!
  - SLPs report using recasts in practice
  - SLPs report training others to provide recasts
- Are recasts effective in everyday practice?
  - A review of Systemic barriers suggests that recasts may not be maximally effective in practice
    - Inadequate knowledge (metalinguistic awareness)
    - Inadequate training time
    - Inadequate service delivery time

Making Recasts More Accessible
- Teachers, caregivers, and even many SLPs find grammar to be off-putting
  - Metalinguistic knowledge may be weak, but to improve the child’s output, we need to enhance their input
  - Various ‘hooks’ can make it easier for a caregiver/teacher to support your language goals
- Goal: Build on natural regularities in the language and enhance the input

Toy Talk

1. Talk about the toy
2. Give the toy its name
3. Use Toy Talk in everyday routines

- When a third person, singular subject is present, in English, you must mark tense/aspect (is/are)
- Naming the toy and describing the action obligates tense markers
- Using toy names (instead of pronouns) increases variety in the Input
- Increased variety helps the child attend to the marker instead of the contracted pronoun = be form, which is likely learned as a rule/memorized chunk

Making Recast Therapy More Accessible
- Teachers, caregivers, and even many SLPs find grammar to be off-putting
- Metalinguistic knowledge may be weak, but to improve the child’s output, we need to enhance their input
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Teach Cognitive Verb Vocabulary Words

Boosts Complex Syntax Use by Adults
Teach 1 Target, Plan to Coach, Track your Recasts

- Pick 1 grammatical target to focus on for a while
  - Develop materials to support metalinguistic awareness of that target
  - Figure out which elicitation scenarios can be taken up by parents/teachers
- Plan to coach
  - Find ways to move from 5 min hallway conversations to direct coaching
  - What works in your context?
- Ask people you work with to track their recasts & Track your own
  - A simple tally sheet will improve your practice!

Syntax Stories

- Stories that repeatedly use the target structure
  - Usually specially written, but sometimes commercial books work
  - Stories should be 20-30 sentences long
    - 15-20 exposures to the target per story (~25% of the sentences)
    - Sometimes illustrated, sometimes not
    - Like auditory bombardment, but embedded in a more natural context
    - Traditionally used prior to recast therapy but some work suggests use alone is also effective

Evidence for Syntax Stories (TD kid)

10 specially written books 2x/day for 10 days
300-600 exposures
Small group/whole class delivery

- Vasileyeva, Waterfall & Huttonreicher, 2001
  - Production & Comprehension of Passives
  - Typically Developing 3-4 year olds
- Siemel, Hesketh & Ashworth, 2015, 2016
  - Reported Speech, Subordination
    - Typically Developing 7-8 year olds
    - Use in a Story Retell at 2 weeks and 10 weeks Post

Syntax Stories – Evidence from DLD

Parental Book Reading
Syntax Stories Resources

- Write your own...
- Pick the target THEN pick the book
- It’s okay to edit the book to increase the opportunities
  - https://books.cornerstone.com/booklet/
  - https://allisonsfere.com/negotiation-books/
  - Children’s books for syntax and semantic targets
  - http://www.msu.edu/romdi/kuster/2/languageforbooks.pdf

Wrapping Up

Enhancing Recast Therapy

- Get The Dose Up
  - 600-1200 exposures to a target
- One Target At a Time
  - Kids learn best with focused stimulation
- Pick Hard Verbs
  - Making the input DIFFERENT can promote generalization & rule learning
- Variety is the Spice of Life
  - At least 24 different verbs
- Attention Matters
- Set Goals based on Pre/Inter skills
- Add Auditory Bombardment – Maybe?
- Be Simple, But Be Grammatical

Recasting

- Rationale
- Evidence base is strong
- Methods for enhancing efficacy
- Systemic barriers may limit uptake
- Need to support implementation
- Preliminary evidence for alternative naturalistic approaches
  - (Explicit and Metalinguistic approaches may also be helpful...