Optimizing Language Outcomes for Young Children with ASD: Adapting Enhanced Milieu Teaching (EMT)

Ann P. Kaiser, PhD
Jodi K. Heidlage, MA, Jennifer Nietfeld, MA, & Suzanne Thompson. MEd, BCBA
Vanderbilt University
Disclosure Statement

• I have relevant financial relationship(s) with services described in this presentation.

As an employee of Vanderbilt University, I was the recipient of research grants that supported studies described in this presentation and which informed the content of the presentation.


I have no relevant nonfinancial relationship(s) to disclose.
Today’s Talk

• Characteristics of Children with ASD
• Principles of Enhanced Milieu Teaching (EMT)
• EMT Adaptations for Young Children with ASD
• EMT Toolbox for Working with Children with ASD
• Questions and Discussion
Social Communication Is A Core Deficit for Children with ASD

- **Persistent deficits in social communication and social interaction across multiple contexts**
  - Deficits in social-emotional reciprocity
  - Deficits in nonverbal communicative behaviors used for social interaction
  - Deficits in developing, maintaining, and understand relationships

American Psychiatric Association’s Diagnostic and Statistical Manual, Fifth Edition (DSM-5)
Naturalistic Developmental Behavioral Interventions (NDBI) for Children with ASD

• Delivered in naturalistic and interactive social contexts, such as play and daily routines

• Involve child-directed teaching strategies

• Based on empirically-based intervention methods derived from both the principles of behavioral learning and developmental science

What is Enhanced Milieu Teaching?

- EMT is a NDBI with an evidence-base of over 20 years of research.
- EMT is a naturalistic, conversation-based intervention that uses child interests and initiations as opportunities to model and prompt language in everyday contexts.
- Uses adult responsivity, modeling, expansion of child communication forms, and systematic prompting to increase spontaneous and social use of language.
EMT Principles and Strategies

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

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

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

Kaiser & Hampton, 2017
Positive Effects of EMT

• **Increases child use of language targets**
  - **Early syntactic forms** (Kaiser & Hester, 1994)
  - **Moderately complex syntax** (Warren & Kaiser, 1986)

• **Increases child frequency of communication**
  (Warren et al., 1994; Kaiser et al., 1993; Curtis et al., 2017)

• **Generalization across settings, people, and language concepts**

• **Maintenance of newly learned targets**

• **More effective than drill-practice methods**
What Children Bring to EMT

- Access to Input
  - Intelligibility
  - Fluency

- Person
  - Object
  - Activity

- Rate
- Form
- Functions
- Transparency to partners

- Imitation
- Auditory memory
- Efficiency
## Children with Autism

<table>
<thead>
<tr>
<th>Communication Challenges</th>
<th>Adaptations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty with joint engagement and nonverbal communication foundations</td>
<td>Model and teach joint engagement behavior</td>
</tr>
<tr>
<td>Limited play skills and brief duration of play</td>
<td>Model and teach play skills to support engagement, language teaching, cognitive development</td>
</tr>
<tr>
<td>Requesting rather than commenting (limited social interest)</td>
<td>Model commenting, limit requesting</td>
</tr>
<tr>
<td>Very low rate spoken language,</td>
<td>Add SGD, teach joint engagement, behaviors,</td>
</tr>
<tr>
<td>Interfering behavior</td>
<td>Teach Strengthen social motivation, differentially, support positive behavior</td>
</tr>
</tbody>
</table>
EMT Modifications to Fit What Children with ASD Bring

- Support speech development
  - Add AAC
  - Teach partners
  - AAC support

- Increase social communication
  - Teach joint attention skills
  - Increase rate

- Teach imitation
  - Add discrete trials
  - Increase dosage
  - Support generalization

- Teach play skills
  - Increase person engagement
  - Teach coordinated joint attention

- Mode
- Engagement Strategies
- Baseline Communication
- Learning Strategies

Ohio ASHA 2018 Children with ASD
Research-Based Modifications of EMT for Children with ASD

- **JASPER + EMT [J-EMT]**
  - Teach joint attention, symbolic play, regulation
  - Kasari, Kaiser et al, 2014
  - Kaiser & Roberts, IES in progress

- **JASPER + EMT + AAC [J-EMT+ SGD]**
  - Teach joint attention, symbolic play, regulation
  - Include speech generating device or signs for input and output
  - Kasari, Smith, Lord & Kaiser, in progress
  - Kaiser, Hampton & Fuller, in progress

- **Add Trial Based Teaching**
  - Add DTT as rescue protocol or preteaching protocol
  - Kasari, Smith, Lord & Kaiser, in progress
  - Kaiser, Hampton & Fuller, in progress

- **Support Partners to use EMT and child mode**
  - Parent plus Therapist
  - Teach Model Coach Review
  - Kaiser & Roberts, 2013
  - Roberts & Kaiser, 2015
  - Kaiser, Hampton & Fuller, in progress
EMT for Young Children With ASD
EMT components

1) Setting up a context for intervention by building routines
   - Noticing and responding to communication
   - Mirroring child actions and mapping language

2) Play Modeling and Expansions

3) Language Modeling and Expansions

4) Time Delays

5) Milieu Teaching Prompts
Setting up a Context for Intervention
Setting a Context for Intervention

- Communication develops on a platform of shared joint attention and engagement
  - Social interaction between child and adult
  - Play with objects and partner
  - Joint object/partner engagement
  - Coordinated object/partner engagement
  - Everyday routines where communication is functional

For children with ASD, building a communicative relationship is essential
Setting the context for communication

- Engagement is a child’s involvement with objects, activities, and/or partners

Getting a child engaged
  - With you as a social communication partner
  - With toys, activities and routines

For children with ASD the critical features of context: social relationship, motivation to play and engage, and interest in person, toys, activities
Play Routines as Communication Contexts

- What is a routine?
  - Sequence of thematic play steps
- Routines are ideal for teaching language
  - Engaging
  - Predictable
  - Repeatable
  - Adaptable: become more flexible, complex, and longer over time
- Example
  - Build with blocks, put people in house, crash house
  - Re-start the routine then elaborate
Play Routines are important because...

- Routines provide the opportunity to:
  - Set clear behavioral expectations
  - Map new language onto familiar motivating steps
  - Create context for joint engagement
  - Expand or build upon skills that the child is already doing:
    - Become more flexible about how steps are combined or sequenced
    - Learn some new steps
    - Learn higher level or more complex steps
The child is watching other people

The child and partner are actively engaged in the same activity, and the child is actively and repeatedly acknowledging the partner's participation, likely by visually referencing the partner at critical junctures in the interaction.

The child is not focused on a toy or person

The child and partner are actively engaged in the same activity, but the child is now acknowledging the partner

The child is focused on an object by him/herself

The child is watching other people

The child is not focused on a toy or person

Engagement States
Why is Coordinated Joint Engagement so important?

- Increasing coordinated joint engagement increases the child opportunities for learning
  - observational learning
  - modeling
  - feedback for communication
  - developing social motivation
  - developing social relationships
Joint Engagement

• Signs that the child is not jointly engaged:
  – Object focused: playing with a toy and not observing you or taking turns
  – Wandering
  – Observing without interacting
  – Problem behavior

• Signs that the child is jointly engaged:
  – Turn taking in an activity
  – Related requests or comments
  – Eye contact
  – Commenting
  – Material exchange
Setting up routines

- Choose toys at the child’s play level
- Have multiple choices
- Join the child in the activity
- Follow the child’s lead and interests
- Imitate the child’s actions
- Use environmental arrangement throughout the routine
  - Bring over new choices
  - Clear away unused materials
- Match, match, match, model
- If these strategies don’t work quickly, use prompting or brief direct instruction to teach play skills
How to engage a child in play

Environmental Arrangement
• Make sure there are appropriate and interesting materials available and an open space to engage.

Ask an open question
• What are you going to play with?
• What will you do with these toys?

Offer a choice
• Consider using language alone, language paired with gesture, or language paired with a visual choice.

Choose a toy/activity
• Make a choice for the child
• Model the desired behavior and hand the child the next piece. Repeat until the child engages independently.
Before we can teach language...

- **Do we have engagement?**
  - Do we have toys that motivate the child?
  - Have we taught the steps to the routine?

- **Do we need behavior support strategies?**
  - Is behaviors getting in the way of teaching/learning?
  - Do we need to problem solve how to address behavior first?
Behavior Support

- Identify Function
- Quick strategies
  - Ignore and redirect, reinforce engagement
  - Give instructions, follow through
  - Add structure and supports
Notice and Respond to Communication
Noticing a Variety of Communication

All children are communicating **now**

**Prelinguistic**
- Point
- Show
- Give
- Vocalizations

**Linguistic**
- Signs
- Pictures
- Symbols
- Words

**Requesting**
- Reach
- Lifts arms up
- Shakes head

**Commenting**
What does this look like?

• Notice and respond every time the child communicates
  – Eye contact
  – Gestures
  – Vocalizations
  – Words
  – Actions (requests, instrumental behavior)

• Respond by talking about what the child is doing.
  – Respond verbally
  – Respond on AAC mode (if applicable)

• Language is most meaningful when it’s related to what the child is doing OR in response to what he/she is communicating
Why Notice and Respond?

• Noticing and responding to all communication teaches the child that their communication is important to you.

• By acknowledging all communication and communicative attempts you reinforce the child for communicating.
  – Increase the likelihood that they will initiate in the future.

• The more the child communicates, the more practice, more feedback, and the easier communication becomes.
How is the Child Communicating?

Watch the videos and look for:
1. How did the child communicate?
2. How did the adult respond?
Encourage Turn Taking
Take Turns

- Take turns communicating
  - Similar to taking turns in an activity.
- Teach turn-taking
  - Allow time for the child to communicate.
- Play a game of “communication catch”
  - Child communicates
  - Adult responds (and waits)
  - Child communicates
  - Adult responds (and waits)
Why Take Turns?

• It gives the child practice initiating communication
• It teaches the child how to have a conversation
  – Child communicates
  – You communicate and WAIT, which signals to the child that it is his or her turn to communicate
After your response to the child, WAIT for them to communicate again before taking a turn.

If they are NOT communicating and you have nothing to respond to, try the next strategy!
Nonverbal Foundations for Talk

- Turn taking in play and routines
- Joint engagement behaviors
  - Point, show, give
  - Natural gestures
  - Model joint engagement behaviors
  - Respond to joint engagement behaviors
  - (add language)
Mirroring and Mapping
Mirror and Map

- **Mirroring**: adult imitates the child’s nonverbal behaviors

- **Mapping**: adult “maps” language onto these actions, by describing these actions
Why use mirroring and mapping?

- Mirroring allows the adult to join in the interaction with the child.
- Mapping provides the child with a language rich description of the activity.
- Mirroring and mapping allows the adult to have balanced turns when the child is not communicating.
- What the adult says is more meaningful since the adult and child are doing the same action and language is “mapped” right on top of what the child is doing.
What does this look like?

- Use mirroring and mapping when the child is not communicating.
- Mapping must come after mirroring.
- First imitate the action and then label the action with words:
  - child: {pours sand}
  - adult: {pours sand} pour
How and When to Mirror and Map?

- Mirror (imitate) close to the child’s actions to make language more obvious
- Avoid mirroring behaviors that are unacceptable (e.g., throwing toys, hitting)
- Balance mapping and playing (e.g., don’t over map)
  - Give the child space to initiate if they are not communication
Beginning to MODEL targets

- **One-word Targets:**
  1) Nouns (people, places, things)
  2) Verbs (actions, state)
  3) Proto-verbs (prepositions; in, out, on)
  4) Requesting Words (help, more, open)

- **Two-word Targets:**
  1) Agent + Action (e.g., The dog barks)
  2) Action + Object (e.g., Stir the beans)
  3) Preposition + Location (e.g., in the house)
  4) Modifier + Noun (e.g., big truck)

**Three-word Targets:**
- 1) Agent+action+object
- 2) Pronoun + two-word targets; verb phrases
- 3) Introduce verb tense marking, plurals,
Using Target Language

• 50% of what you say should be at child's language level
  • What you want the child to produce
• 50% should be slightly higher than the child’s current target level
  • Building receptive language
    – 1-2 words above their level
    – Focus on teaching words
      – nouns, verbs, modifiers
      – agents,
    – use grammatical markings
How to model language?

• Choose targets based on the language the child is already using and what he should learn next (developmental)
• Consider both content and function
• How does the child communicate now?
  – Gestures, vocalizations
  – Single words
  – 2 words
  – 3 words
Why model language?

- Children learn language through modeling.
- Contingent modeling that is in response to a child’s communication is the most powerful form of modeling.
- Simplifying language to match their language targets helps children learn language more quickly:
  - Easier to imitate
  - Easier to understand
When to model new language?

- After the child communicates
  - Respond with a language target
    - Remember to model with child’s mode (if applicable)
- When you are doing the same action or have the same object as the child
  - Child: {build}
  - Adult: {build} build
- While taking communication turns
Play Expansions
When to expand play

• After repeating the same sequence a few times
• When the child begins to show signs of disinterest
• When the child is “stuck” repeating actions
• When you need to model new/diverse/more complex language
Play Models

• Model play actions during engaged interactions

• Pay attention to the child’s play level
  - indiscriminate actions
  - discriminate actions (functional)
  - simple to complex combinations,
  - child as agent,
  - doll as agent,
  - simple schemes,
  - complex scheme (See Kasari, et al 2006)

• Model diverse actions, objects, sequences

• Match then expand the child’s play actions, objects, sequences and level
How to expand play

• Use environmental arrangement to cue and support play
  – Introduce new choices of developmentally appropriate materials and that are motivating for the child
  – Clear away unused materials
How do we expand play?

- Set out new materials (EA)
- Hand the child new materials
- Model a new action with materials
Expanding
Communication
Modeling Provides a Foundation for Expansions

- Gestures
- Targets
- Talk about play and activities
- Talk within routines
Expanding Communication

- An expansion is repeating what the child communicated and adding more words
  - This includes expanding non-verbal communication
  - Recasting vocalizations
- The most powerful expansion includes one of the child’s communication targets
Expanding Communication

• The best time to teach new language is when a child is already communicating.

• Expand by:
  – Recasting
  – Adding a word
  – Extending the content
Why expand communication?

- Expansions immediately connect the child’s communication to new forms of communication
- Expansions help children learn new vocabulary and use more complex sentences
- For children with ASD, modeling new language within the “window” of their social attention may be more effective
How to expand communication?

• When the child communicates, repeat their communication and add target words
  – Child: eat cookie
  – Adult: The fish eats the cookie
  – Child: ball
  – Adult: The ball rolls

• Expansions immediately connect the child’s communication to language that is more complex while maintaining the child’s meaning
Expanding Gestures

• Point/reach:
  – Child: {points to/reaches for baby}
  – Adult: {points to baby/reaches for baby} baby

• Show
  – Child: {hold up block}
  – Adult: {points to block} block

• Give
  – Child: {gives adult car to drive}
  – Adult: {takes the car} car
Expanding vs. Recast

• If the child is making an attempt to imitate a word, the adult should recast (repeat the word in a phonologically correct form) rather than adding new language.

• Child is reinforced for their verbal attempt but provided with a clearer phonological model.

• Always: communication first.
Let’s Review

- **Develop routines**
  - Build routines
  - Bring in new actions/materials to expand play
  - Teach play skills through modeling, expansion

- **Respond to all child communication**
  - Respond with target words and phrases
  - Expand the child’s communication with target words and phrases

- **If the child is not talking, imitate his actions and model new target language** (mirror and map)
  - Nouns
  - Action verbs
  - Protoverbs
  - Requests
Using Time Delays to Elicit Communication
What are TD strategies?

- The goal of TD strategies is to increase initiations.
- Non-verbal cue that encourages children to communicate with increased independence.
- TD strategies help elicit “communication” not just language.
  - Cues the child to initiate communication with you.
TD Strategies

- **Inadequate portions**: Providing small or inadequate portions of preferred materials
- **Assistance**: Creating situations in which the child needs the adult’s help
- **Pause in routine**: Setting up a routine in which the child expects certain actions and then waiting before doing the expected action
- **Choice making**: The adult holds up two objects and waits for the child to communicate about which item they want
How to use TD strategies?

1. Set up the opportunity to encourage the child to communicate by using a TD strategy
2. Wait until the child communicates requests, shows a preference (gestures, vocalizes, says a word)
3. Respond: give object, expand the child’s communication
Using Milieu Taching Episodes to Prompt Communication
What is a language prompt?

- A signal to the child to do or say something
- There are 3 types of language prompts:
  - Least Support
    - Open prompt
      - “What do you want?”
  - Choice prompt
    - “Fish” or “gummy”
  - “SAY” prompt
    - “Say Gummy”

Most Support
What to Prompt?

- The child’s language targets:
  - Target 1: noun (e.g., cat)
  - Target 2: verb (e.g., eat)
  - Target 3: protoverb (e.g., in)
  - Target 4: request (e.g., help, again)

- Mode
  - Spoken or AAC
  - **Only** prompt with highly motivating actions or materials, and when you have compliance and engagement
How to Prompt Language

- **Wait for the child to request**
- **Use a time delay strategy to elicit a specific request**
  - Inadequate proportions
  - Assistance
  - Pause in routine
  - Waiting with cue
  - Choice making
- **Choose the level of prompt the child needs.**
- **Respond with expansion and give requested item**
- **Use a least to most prompting strategy**
How to Prompt Language

- If the child does not respond to the first prompt
  - Use a least-to-most prompting strategy to support the child
    - Repeat
    - Make it easier for the child to respond
      - Mand: Tell me what you want
      - Verbal choice: Do you want the truck or the ball?
      - NV choice: show two objects as a choice
      - Model: (Say) Truck

- Always respond with expansion, positive affect and give requested item

- Tailor the prompting strategy to the individual child and the skill
Let’s Review

- **Develop routines**
  - Model actions to teach the child to participate
  - Bring in new actions/materials to keep the routine interesting

- **Respond to all child communication**
  - Pay close attention to nonverbal behavior
  - Model target level talk
  - Expand the child’s communication with target words

- **If the child is not talking,**
  - Imitate his action and model new target language (mirror and map)
  - Use time delays
  - Prompt language when the child shows interest
    - Sparingly
    - To teach new language
    - During teachable moments
<table>
<thead>
<tr>
<th>Adaptation</th>
<th>How to teach</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint engagement and play</td>
<td>Environmental arrangement, model, expand, prompt</td>
<td>Play assessment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Play skills for modeling and building routines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toys</td>
</tr>
<tr>
<td>Use of SGD</td>
<td>Model, expand, prompt</td>
<td>Software. SGD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skills for setting up, managing SGD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fluent integration into EMT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supporting partners</td>
</tr>
<tr>
<td>Train parents</td>
<td>Teach-Model-Coach- Review</td>
<td>Skills for teaching parents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Handouts, videos</td>
</tr>
<tr>
<td>Add trial based teaching</td>
<td>Direct instruction</td>
<td>Skills assessment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Curriculum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data collection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direct instruction skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plan for integration with EMT</td>
</tr>
<tr>
<td>Support Behavior</td>
<td>Positive behavior support strategies</td>
<td>Skills for positive behavior support</td>
</tr>
<tr>
<td></td>
<td>Environmental arrangement</td>
<td>Behavior consultation</td>
</tr>
<tr>
<td></td>
<td>Interesting, motivating activities</td>
<td>Planning across settings</td>
</tr>
<tr>
<td></td>
<td>Visual schedules, tangible reinforcers, etc. as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>needed</td>
<td></td>
</tr>
</tbody>
</table>
Adaptations for Children with ASD:

Include SGD

- Make SGD accessible across people, settings,
- Assess motor and symbol use skills
- Adapt display to child skills, language abilities, interests
- Program for high interest activities

Teach using core EMT strategies
- Embed in interactions, communicate using SGD
- Model with words and SGD at least 50%
- Expand with words and SGD at least 50%
- Use time delays and prompting much less than modeling
Adaptations for Children with ASD: Teach Parents to Use EMT

- **What to teach**
  - Play and engage
  - Notice and respond
  - Model and expand
  - Time Delays and Milieu Prompting

**Teach Using Teach-Model-Coach-Review**
Based on adult learning strategies
Systematic, planned, responsive to child and parent
Give clear rationale, instructions, information
Model with the child while parent watches:
do
dose,
priming,
Support the parent while practicing:
Review the impact of parent behavior, reflect with parent, encourage parent questions and input
Adaptations for Children with ASD: Add Trial Based Teaching

• What to teach
  – Imitation
  – Comprehension
  – Responding to prompts
  – Basic SGD responding

• Teach using direct instruction or trial-based strategies
  – Trials, with repeated practice
  – Antecedent-Response-Consequence
  – Tangible reinforcers if needed
  – Carefully sequenced skills
  – Data driven
  – Use a communication curriculum (e.g., Smith et al, 2001)
EMT Modifications to Fit What Children with ASD Bring

- Teach imitation
- Add discrete trials
- Increase dosage
- Support generalization

- Teach play skills
- Increase person engagement
- Teach coordinated joint attention

- Support speech development
  Add AAC
  Teach partners
  AAC support

- Increase social communication
- Teach joint attention skills
- Increase rate

Ohio ASHA 2018 Children with ASD
Questions?


Acknowledgements

• Families and Children who participated
• Autism Speaks, NICHD, IES
• Vanderbilt, UCLA and Kennedy Krieger Research Teams—Connie Kasari (PI), Rebecca Landa (Co-PI) and our outstanding interventionists and data support team

• For more information
  Ann.Kaiser@vanderbilt.edu
  This talk and supplementary information will be posted at
  https://vkc.mc.vanderbilt.edu/kidtalk/