# College of Education
## UNT Kristin Farmer Autism Center
## Adventures in Autism

**Focused and Engaged**: *PARENT-IMPLEMENTED INTERVENTION WITH iPADS TO ENHANCE EXPRESSIVE  LANGUAGE IN YOUNG CHILDREN WITH DISABILITIES*

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# Learning Outcomes

# Learning Outcomes for Todays Presentation



- The participants will identify three evidence-based parent-implemented intervention practices from peer-reviewed studies review.

- The participants with identify the importance of joint attention for young children with ASD and four strategies to promote joint attention.

- The participants will demonstrate the four basic steps of the intervention, and how to use them with an app.

- The participants will identify three culturally responsive practices and resources in working with parents.

# Can You Relate?



I am looking for an evidence based intervention for young children with language delays that is…

- Activity based
- Focuses on parent implementation
- Home environment
- Follows on developmentally appropriate practice (DAP)
- Social communitive
- Culturally responsive
- Use of mobile technology

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# Children Use and Are Surrounded by Technology

# Technology Use in the Home Fun Facts

- The use of technology is prevalent in the home (e.g. TV, iPhones, iPads, laptops, & gaming items) Brandt Conrad (2015).

- Children with special needs on average use screen media 42 minutes a day. There is a significant decrease in TV and videos offset by mobile devices (Common Sense, 2019).

- The availability of personalized applications is astounding. There are over 1.8 million (4 hundred thousand more than in 2015) apps available from the Apple's app store and 2.0 million for Android. (Stastica, 2019).

# Technology is Deeply Embedded in our Culture
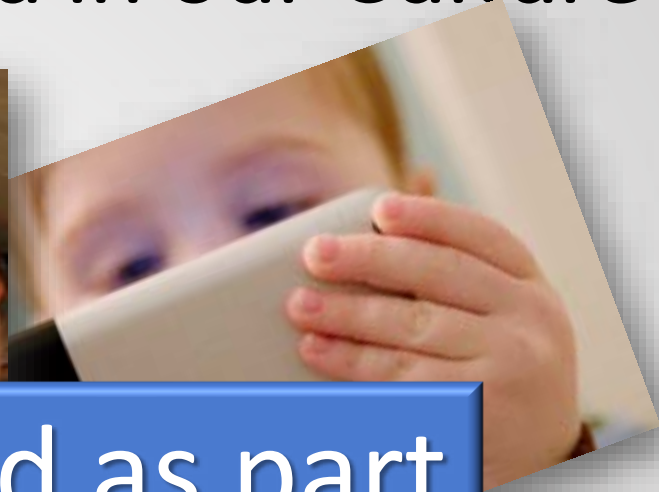
It must be considered as part of developmentally appropriate practice

# Apps and Children with ASD

## How do I pick at app?

- Empirical Research to support the use of the app (see Autism Speaks list).

- Able to enable customized visual supports such as the camera.

- The child's motor skills match the demands of the app software.

- The amount of time and resources to teach the app.

- The cost and quality of the app.

**Some suggested Story Making Apps from Autism Speaks**

Pictello



Sock Puppets

| Criteria | Exceeds Expectations | Meets Expectations | Does Not Meet Expectations |
|---|---|---|---|
| Customizable | ☐ Grammar and vocabulary can be easily accessed and updated to represent student's current language ability/usage.<br>☐ Enables download of natural sounding voices with inflection<br>☐ Change color, font, and voice of multiple buttons at once<br>☐ Allows for pairing of words with pictures<br>☐ Authentic photos from the student's environment can be utilized as desired; choice in photographs or other types of pictures also provided<br>☐ App collects data on student word/ language usage | ☐ Grammar and vocabulary can be updated to represent student's current language ability/usage<br>☐ Some ability to change color, font, and voice of multiple buttons<br>☐ Allows for pairing of words with pictures<br>☐ Allows for choice in photographs or other types of pictures (symbols, drawings, etc.)<br>☐ App has some data storage capabilities | ☐ Pre-set vocabulary from developer that cannot be altered<br>☐ No pairing of words and pictures<br>☐ Only uses real life photos or symbolic pictures<br>☐ Pictures are not age or developmentally appropriate<br>☐ No data storage capabilities |
| Motor Skills | ☐ Minimal to no physical effort required<br>☐ Prevents accidental selections<br>☐ Uses 'Select on Release' to compensate for motor challenges<br>☐ Pictures can be saved in multiple size formats<br>☐ Audio is easy to hear<br>☐ Touch screen sensitivity is adjustable<br>☐ App limits the number of open screens/windows<br>☐ Vocabulary is well organized within app | ☐ Requires low physical effort to use<br>☐ Adjustable picture size<br>☐ Audio is easy to hear<br>☐ Touch screen reacts smoothly, few errors<br>☐ Vocabulary is organized within app | ☐ Requires physical effort to use<br>☐ Pictures size / Audio are not adjustable<br>☐ Prone to accidental selections<br>☐ Touch screen is too sensitive or not sensitive enough causing communication errors<br>☐ Vocabulary lacks organization within app |
| Minimize Extraneous Resources/Time | ☐ Easy to teach students to use app; teaching suggestions included<br>☐ Students use the app independently and almost immediately upon introduction<br>☐ The benefits of using the app appear almost immediately<br>☐ App is generalizable across multiple and related communication goals | ☐ Easy to teach students to use app<br>☐ Students can use the app with minimal adult assistance<br>☐ Time require to learn the app is appropriate for the benefits of using the app<br>☐ App is generalizable across a few communication goals | ☐ Challenging to teach students to use app<br>☐ Time required to learn to use the app is not appropriate for the benefits of using the app<br>☐ App is not generalizable for building other related communication goals |
| Research Basis | ☐ App has been researched and shown to be effective through published, controlled, design studies<br>☐ Evidence-based sources provided | ☐ App construction is based on research based practices (e.g. Universal Design for Learning)<br>☐ Some evidence-based sources provided | ☐ App is not based on best practices<br>☐ No information on sources of content provided |
| Cost-Effectiveness | ☐ Price of the application is justified based on the previous criteria and value of product<br>☐ Offers trial period to test usage before purchase | ☐ App is reasonably priced for value of product<br>☐ Offers trial period to test usage before purchase | ☐ App is unaffordable for most schools/students<br>☐ App is relatively inexpensive but highly ineffective<br>☐ Offers no trial period to test usage before purchase |

# Joint Mediated Engagement

## Key Construct of JME

- Takeuchi and Stevens (2011) describe *joint media engagement* (JME) as the shared experience people have when using digital media.

- Thus, JME experience may happen anywhere and at any time when there are people interacting together with the media.

- Parents have an opportunity to follow their child's lead and spontaneously create opportunities to share perspectives and values as well as scaffold their performances.

- JME is based on joint attention.

## What Does this Mean?

- Theoretically, early interventionists and educators can use JME to strategically support language development for young children experiencing language delays.

- Parent mediated social activities using apps on tablet devices, combined with effective parent-implemented interventions may create unique opportunities to promote social-commutative interactions.

# Speech and Language Target Considerations for Young Children with ASD What We Know about Joint Attention

**Joint attention** occurs when two people share interest in an object or event and there is **understanding between the two** people that they are both interested in the same object or event.

Joint attention should emerge around 9 months of age and be very well-established by 18 months of age.

**Why are we concerned about joint attention when we work with children with autism?** –

Because it provides a critical foundation for **theory of mind, social, cognitive, and language development**.

*Joint attention an area that many young children with ASD struggle.*

Two types of joint attention- Respond to someone's bid for attention and initiate joint attention- Easier for young child with ASD to respond than initiate

- Focus on faces/develop eye contact
- Focus on play and turn-taking
- Focus on pointing
- Focus on encouraging your child to shift attention from what he/she is playing with to what you have
- Focus on creating situations for your child to initiate a request for you to look at something that interests him/her
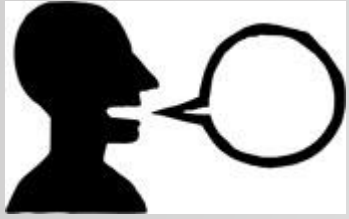
# What if there is an intervention that…

*Combined parent-implemented strategies taught by educators with Developmentally Appropriate Practice using technology?*

## Focused and Engaged

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# Joint Attention Strategies



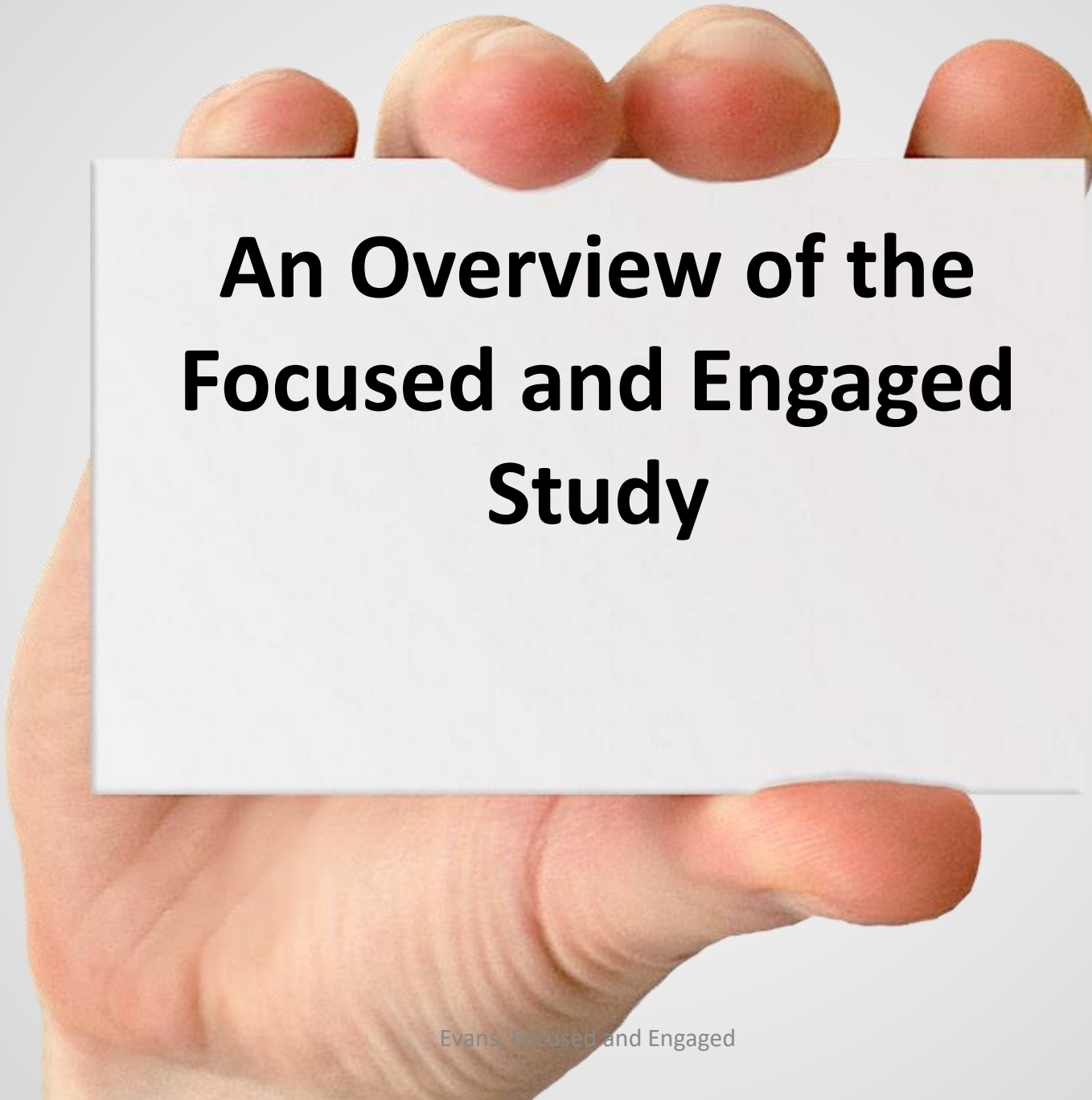## Joint Mediated Learning Model (Schertz, 2005)

**Purpose:** an intervention for toddlers with ASD that targets foundational preverbal social communication within the parent-child relationship.

1. **Focusing**: Help your child share attention with you by looking at or showing them what you would like them to see.

2. **Giving Meaning**: You can help your child understand the meaning of a thing by expressing your feelings (e.g. excitement). Highlight a part that you want them to pay attention, because it is special in some way.

3. **Expanding**: Help your child to increase their understanding and expression by labeling parts of the object, relate the object to something that they may know, and/or expand on their response.

4. **Encouraging**: Make sure to help your toddler feels successful, they learn best is way. (providing choices helps with this and autonomy).

## Focused and Engaged (Evans, 2016)

Taking components of the Joint Mediated Learning Model to engage and enhance a young learner oral language by targeting attention with a shared experience with parents, via technology.

1. **Organizing and planning**: Create an environment that focuses on success. It helps to structure your activity (so they can predict what comes next), use cause and effect (first-then) by presenting task in a logical sequence it helps them make value rules and make sense of their world.

2. **Focusing on faces:** Be direct- "LOOK" (make sure to focus on faces first). Help your child share attention with you by looking at or showing them what you would like them to see.

Provide the expectation (so they can map out their actions)

3. **Turn taking with modeling:** Model the target action or phrase and prompt the child to respond. The prompt will depend on the target **(use of zone of proximal development).**

4. **Evaluate and expand their production**- Evaluate their response and build on their response and add another.

5. **Create initiate response**: Ask them if they want to continue the activity or all done. Provide time delay.
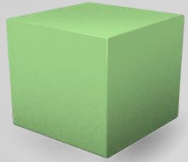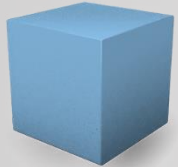
# An Overview of the Focused and Engaged Study

# Building Blocks to the Focused and Engaged Study
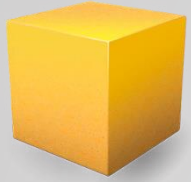
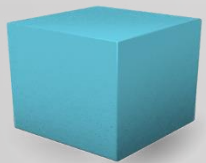**1:** Statement of the Problem and Background

2: Literature Review Results

3: Methods

4: Results & Summary

5. Conclusion & Recommendations

# Statement of the Problem and Background
## *Problem, Purpose, & Significance*

### Problem

- More research is needed...
  - Activity-based
  - Parent implemented strategies
  - Home environment
  - Social **Communicative Intent**
  - Use of mobile technology

### Purpose

- To determine if there is a hypothesized **causal relation** of the Joint Attention Mediated Learning-Focus on Verbal Expression with Technology (JAML-FVET) intervention that uses co-viewing to promote the acquisition and use of **targeted words** in the **home** environment.

### Significance

- Expanding on the **Joint Media Engagement Model** (Takeuchi and Stevens, 2011).
- Early Educators are challenged to teach parents **effective strategies** for **oral language** skills with their young child.
- Parents frequently lack the knowledge to use the technology relevant and **developmentally appropriate** ways to promote their child's language learning
- An empirical study is needed to evaluate the potential impact of a parent-implemented intervention with **mobile technology to address language delays** in young children.

# Four Easy Steps: Focused and Engaged for Verbal Expression with Technology

1. **Set up the Environment**
   a. Minimize distractions
   b. Instruction sheet visible
   c. Adult sitting beside the child

2. **Focus In**
   a. The adult gains the child's attention "look"
   b. The adult highlights the part of the app/object

3. **Turn Taking with Modeling**
   a. The adult says "first-then"
   b. The adult says the targeted word(s) as he/she does the action and then says, "your turn" and provide a 3 second delay

4. **Prompt for Production and Expand**
   a. The adult asks a question to elicit the target word (no model)
   b. When the child says the word the parent says, "good words"
   c. After 10 minutes duration the adult prompts for continuation of the activity of end the activity "more or all done".

# *Make a Scene App*



- DAP and appealing
- Scenes are easy to manipulate
- Visual and audio output
- Tactile
- Context-rich scenes
- Engaging animation
- Life-like sound effects
- Easy to use toolbar and menus

# Research Questions & Measurements

| Questions | Measurements |
|---|---|
| 1. Is there a functional relation between the parent implementation of the Focus and Engaged intervention with mobile technology (iPad running the Make a Scene App) and the child's acquisition of two targeted words? | Direct observation of the frequency of the verbal use of the targeted vocabulary without a model participating in an activity with an iPad. |
| 2. Did the children continue to use the targeted words in the generalized condition? | Direct observation of the frequency of the verbal use of the targeted vocabulary without a model participating in a routine activity. |
| 3. What was the parents' perception of the use of mobile technology as an intervention for their child's communication? | Pre- and Post-Social Validity Survey |

# **Literature Review Results**

# Early Intervention & Parent-Implementation Strategies: What We Know

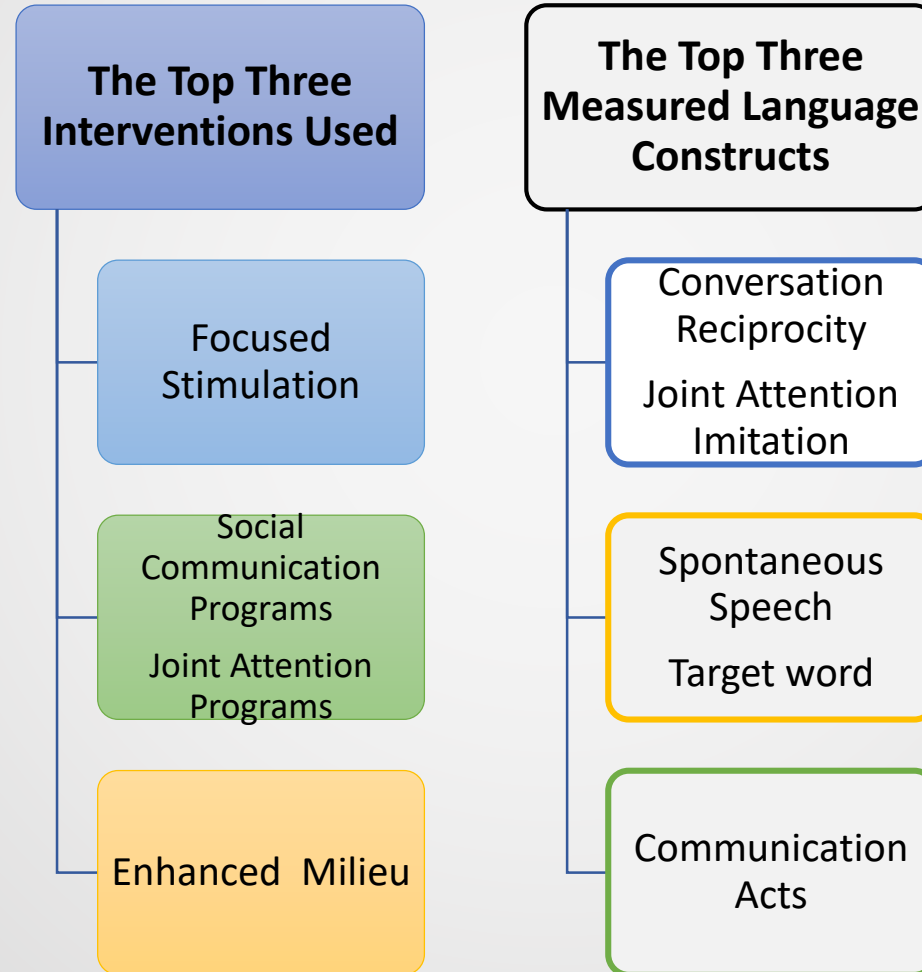Parent-Implementation Meta Analysis: Roberts and Kaiser, (2011)

- The mother's *responsiveness* affect the temporal development of expressive language milestones.

- The quality of *child-directed speech* and the use of supportive *language learning strategies* (i.e. highlighting key components of relationships and expanding the child's production) actually relates to the size of the child's vocabulary. **Point and eye gaze!**

- The *quality of input* (i.e. use of a variety of words and increase syntactic complexity) along with the **amount** of parent-child interactions affects the size of a child's vocabulary.

- Regarding parent's training in language intervention, out of the 18 studies examined, the three most common measured parent strategies that demonstrated positive effects to the child's language development were **(a) parent responsiveness**, (**b) use of language models (language strategy),** and (c) the **adult rate of communication (quality of input).**

# Literature Review

## Key Findings for Parent Implemented Interventions for Expressive Language

**The Top Three Interventions Used**

- Focused Stimulation
- Social Communication Programs
  Joint Attention Programs
- Enhanced Milieu

**The Top Three Measured Language Constructs**

- Conversation Reciprocity
  Joint Attention Imitation
- Spontaneous Speech
  Target word
- Communication Acts

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# Literature on the use of Technology

**Cardon (2012)** showed that parents were able to create **video models on an iPad** with minimal training and implemented the Video Model Imitation Training (VMIT) with fidelity to promote imitation skills for young children with autism.

**Meaden et al. (2013)** proposed **Internet-Based** Parent-Implemented Communication Strategies (I-PiCS) program to reach rural areas.

**Marturana (2012)** introduced the TELL-Tech approach combined M-learning, assistive technology, and Enhance Milieu Technique with a **mobile device**.  They used **Environment Analysis (LENA) to collect date, video conferencing** for instructing, & **Story Maker App** for intervention. *Outcome*: Parents were able to instruct the children with the EMT strategies above baseline during the intervention phases

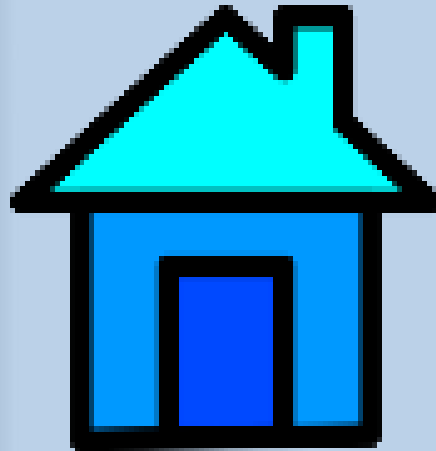# **Methods for the Focused and Engaged Study**

# Methods Overview

## Participants

Four Parent/ Child Dyads

Participates in the EI program

Identified disability with a language delay

Child is 2.5 -3.5 yrs.

No identified hearing or vision loss

No identified oral abnormalities

No known diagnosis of ASD

## Settings

In the family's home

## Materials

- Data Sheets
  - IOA
  - Parent Fidelity
  - Coaching Fidelity
  - Target Words
  - Social Validity Surveys
- Communication Development Inventory (CDI)
- iPad / Make a Scene App

## Researchers

**PI -** SLP with 15 years experience in Early Intervention (EI) & 8 years of teaching in higher education

**Assistants (5)**

1. Colleague: SEAT Center Director

2. Doctoral candidate Special Education

3. Undergraduate in Special Education

4. Master's candidates (2) in Communication & Science Disorders

# Results: Direct Observations of Parent Implementation

**Direct Observation of Existing Intervention Components During Baseline**

- All of the parents demonstrated the ability to set up the environment except for Dyad 1 & 4.
- Dyad 2 & 3 parents in addition demonstrated turn taking and praising the child's attempt to vocalize.

**Direct Observation of Intervention Fidelity**

- Overall the parents completed the first two steps except Dyad 1 & 4.

- Frequently the parents would not have their procedural checklist near them during the intervention.

- More variation occurred during the last two steps.

  -difficulty remembering to say "good words" to praise their child.

  -framing a question to elicit the target words.

# Results: Multiple Baseline
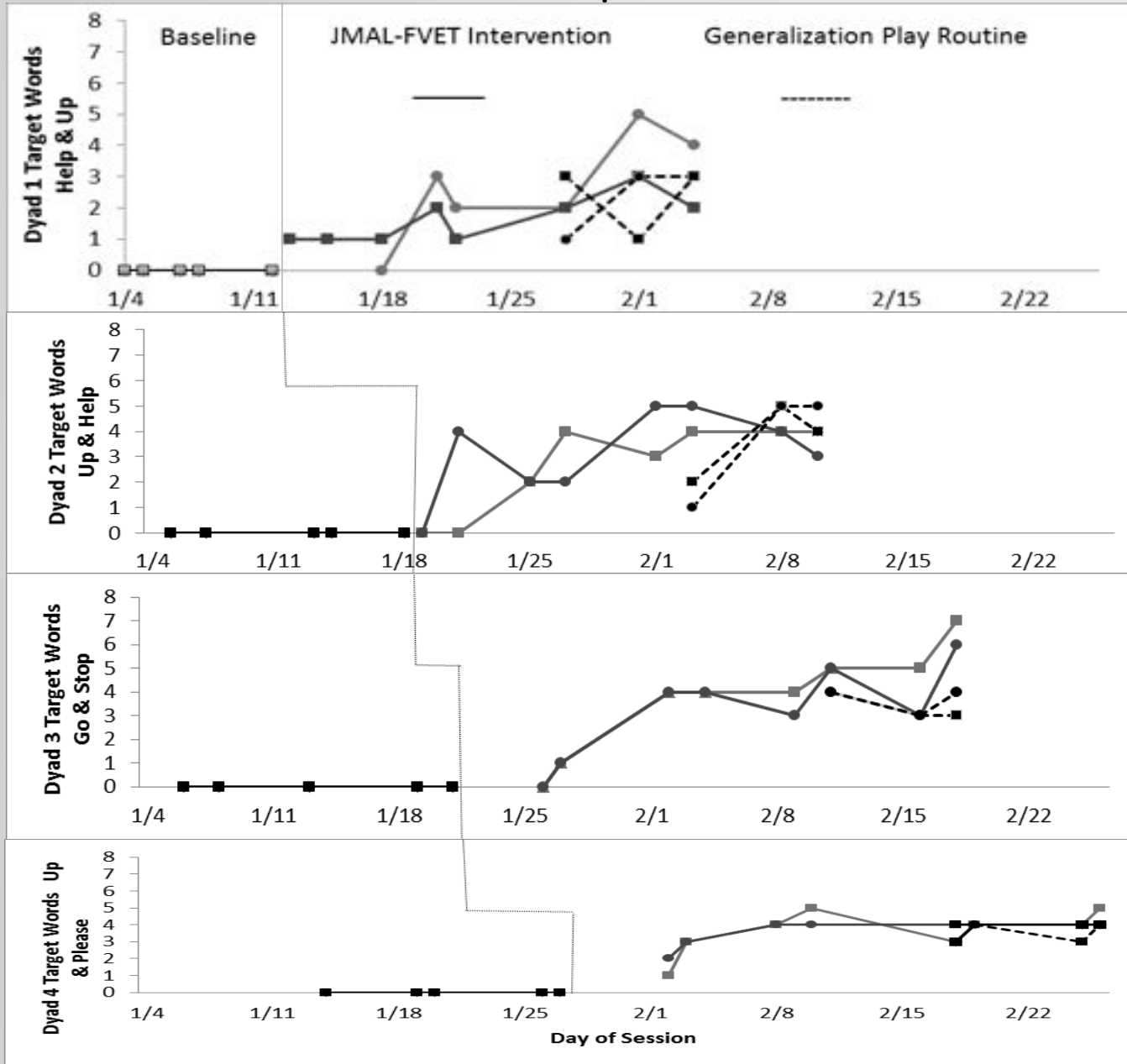


Dyad 1 up = ■ & help = ●
Dyad 2 up = ● & help = ■
Dyad 3 stop = ■ & go = ●
Dyad 4 up = ● & please = ■

# Results

## Question 3. *What was the parents' perception of the use of mobile technology as an intervention for their child's communication?*

Social Validity Pre & Post Mean Values

**Summary**

- Each parent who implemented an intervention in each dyad mean social validity ratings were higher in post-intervention than pre-intervention.

- All parents who implemented an intervention in each dyad indicated a positive outcomes with their children's communication improvement and with the procedure and use of technology.

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# Comments from the Parents

| Parent | Comment |
| --- | --- |
| Dyad 1 | "I believe the focus of two attainable words, we incorporated and focused on also in daily routines led to his success." |
| Dyad 2 | "I feel as if it open up the flood gates of speech for my child. He isn't as shy about repeating words. He is excited about using his new words in his daily routines. We will continue this technique on our own." |
| Dyad 3 | "This is a great way to educate him while playing and doing an activity that he enjoys. This style (use of iPad) keeps his interest longer." |
| Dyad 4 | "My son did well. He is making more sounds. I believe the iPad helped. " |

# Take a Look

- Make a Scene App
  - Information and video http://www.makeasceneapp.com/
  - Farm Yard video: https://vimeo.com/45238959
  - You try ☺

# Mom and her son with an expressive language delay.

Here is a video.

# Responding to More or All Done

Responding to "WH"

# Give It a Try

# *Four Easy Steps to Focused and Engaged Method*

1. **Set up the Environment**
   a.  Minimize distractions
   b.  Instruction sheet visible
   c.  Adult sitting beside the child

2. **Focus In**
   a. The adult gains the child's attention "look"
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4. **Prompt for Production and Expand**
   a. The adult asks a question to elicit the target word (no model)
   b.  When the child says the word the parent says, "good words"
   c.  After 10 minutes duration the adult prompts for continuation of the activity of end the activity "more or all done**".**

# Conclusion: Limitations, Implications, & Recommendations

# Limitations, Implications, & Recommendations

**Limitations**

- Repeated replication is required

-Narrow age focus

-Short intervention phase

-No video recording

-Variability in the nature of the environments and family resource

-Parents did not practice as requested

-Unique temperament of each parent/child and parenting styles

-Design needed to alter for continuing scaffolding and perhaps change of app

-Modeling steps were distracting once the child acquired the word

**Implications**

-Support the use of technology with **social engagement** between the parent and the child creating a shared experience that focuses on **enhancing expressive language**

-Parents can support their child's expressive language through Focused and Engaged using a **DAP** app

-Strategic co-viewing uses a set of **evidence based interventions** that are presented sequentially for parents to implement

-The combination of the **parent** implemented and the **app** created a learning experience

**Future Research**

-Longitudinal research is needed and replication across different populations, ages, and settings

-Further research on the different technology (platforms and apps)

-Research on usefulness of appropriate apps to elicit specific outcomes for a variety of challenges and disorders

-The effectiveness of those apps across routines and for teaching implementation of instructional strategies

# Your Thoughts ?

1. How could the Focus and Engaged Model be used with other apps? Books? Snacks?


2. How could you take the same idea and use it in an early culturally responsive childhood classroom setting?


3. What kinds of support might parents need to use technology in the home?

# Thank you!

# Contact Me!

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# References

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