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Power-up Social Pragmatic Treatment Outcomes with New Evidence Based Practice (EBP) Techniques

Presented in cooperation with the Lavi Institute for Research and Professional Development

Adriana Lavi, PhD, CCC-SLP

Lavi Institute

VideoLearningSquad.com

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Disclosures

- Adriana Lavi, PhD, CCC-SLP
- Financial: Author of Clinical Assessment of Pragmatics (CAPs) and receives royalty payments
Author of the Social Skills Squad intervention, a peer mentored online video modeling curriculum
- Non-financial: No relevant non-financial relationship exists

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Learning Outcomes

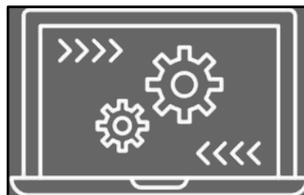
After this course, participants will be able to:

- Define dynamic video-based peer modeling and explain how it can be effectively used to improve social skills of students with high functioning autism and social communication disorders, at elementary through high school levels.
- Describe how teaching nonverbal skills is critical for improving social communication; specifically, the ability to understand social context.
- Describe the significance of pre- and post-treatment study results with two clinical groups (high functioning autism and social communication disorder).

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Also, today we'll talk about...

- Identify and comparatively analyze pre and post-treatment study results with two clinical groups, high functioning autism and social communication disorder



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Exercise

- Before we discuss each of the six pragmatic language constructs and watch sample video-based scenarios, let's preview 3 of our study participants' testing responses.



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Participants

Which of the following participant study groups do the 3 participants represent:

- Typically developing group
- Social communication group

Participant 1?

Participant 2?

Participant 3?

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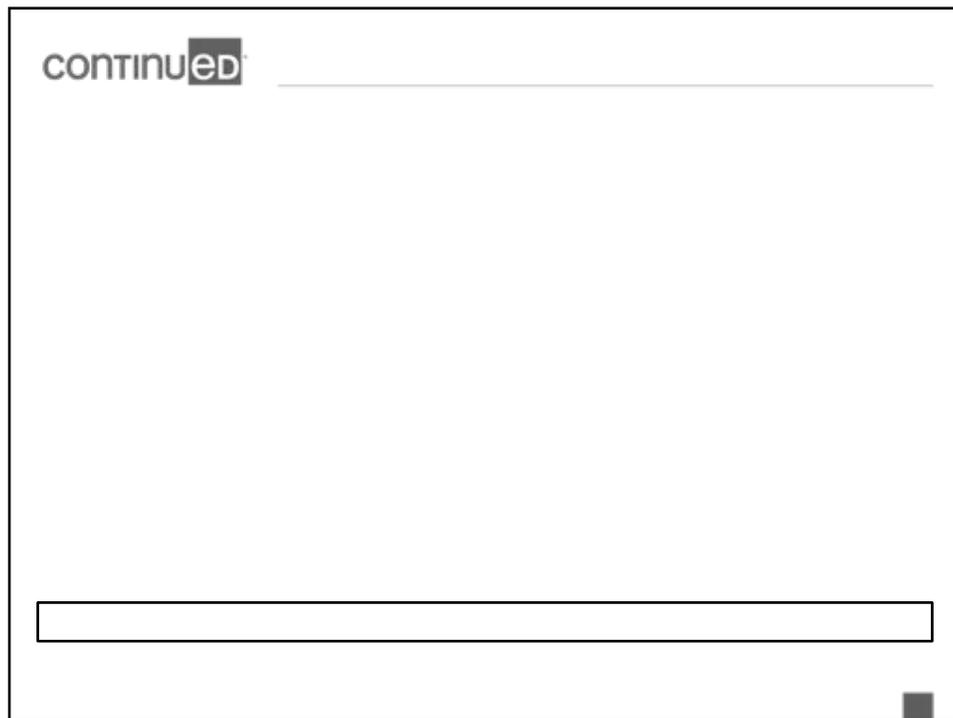
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Tasks

The responses seen in the videos are based on tasks designed to elicit comprehension/expression of instrumental intent.

Let's analyze participants' responses based on tasks designed to elicit comprehension/expression of affective intent.

Q5



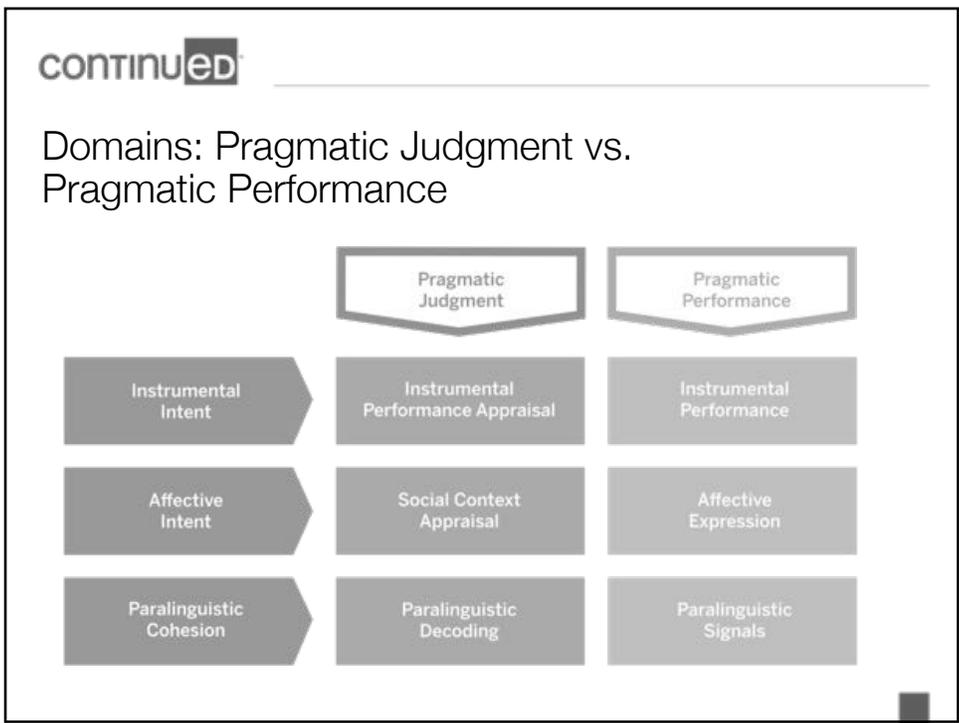
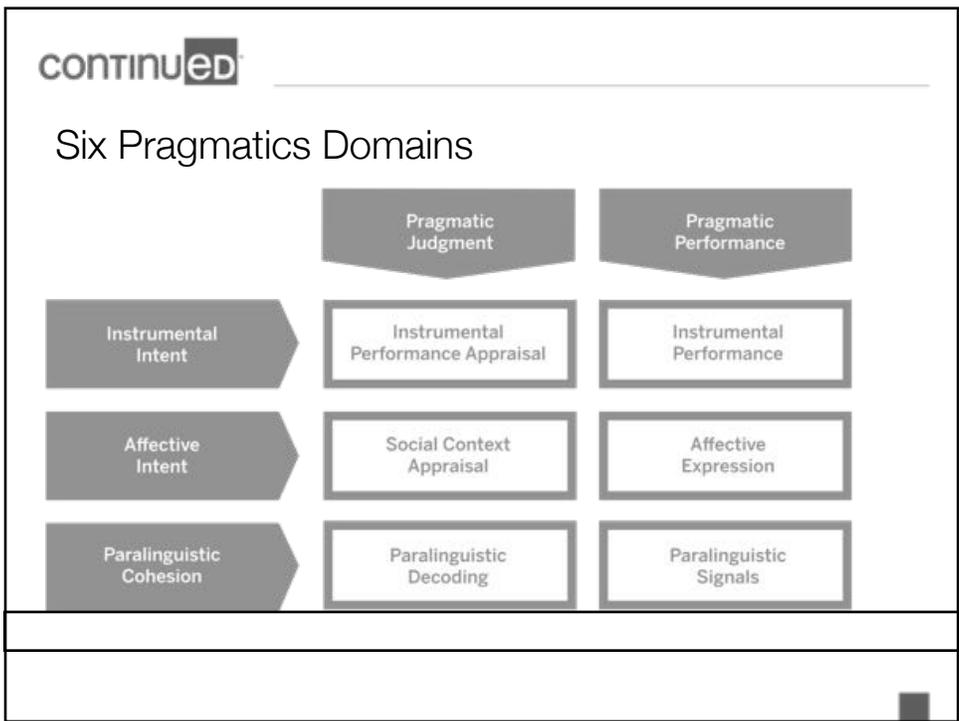
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Discussion

This type of follow up question has been found to efficiently elicit

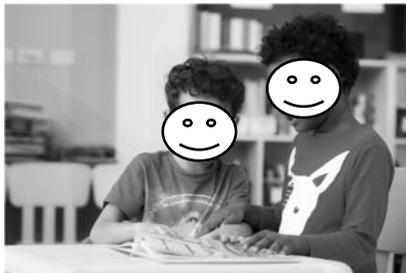
- comprehension of social context:
Did anything go wrong in this video? Y/N What went wrong? What went well?
- use of nonverbal language such as prosody and facial expressions:
Show me, what would you say in this situation and how?

Q9,10



Pragmatic Judgment defined

- Ability to appropriately understand and use language
- Requires appropriate response at appropriate time in social context



(Ryder & Leinonen, 2014; Simmons, Paul, & Volkmar, 2014)

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Receptive vs. Expressive Pragmatic Judgment



Receptively:
identifying correct and
incorrect responses in a
social context



Expressively:
verbally providing
appropriate
responses in a
given situation

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Pragmatic Judgment

- Pragmatic Judgment = receptive pragmatic skills
- Allows more detailed grasp of child's comprehension of social situations
- Distinguishes from broad definition of pragmatic language skills



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Pragmatic Performance defined

- Pragmatic Performance = expressive pragmatics
- Measured via responses given in social situations
- Responses vary, e.g.:
 - Answers to questions/statements
 - Responses to expressed emotions



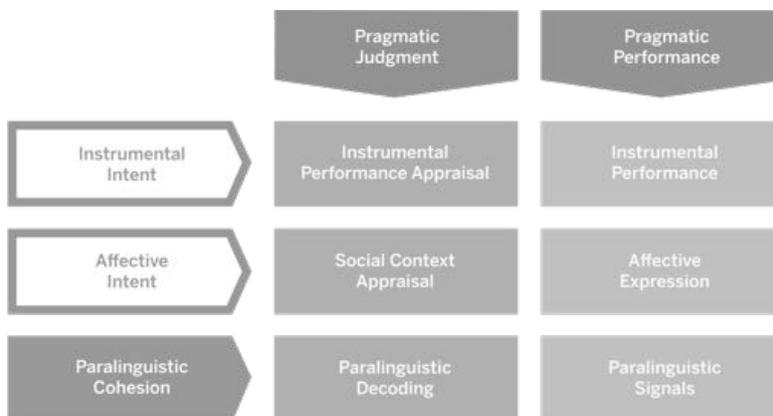
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Pragmatic Judgment vs. Pragmatic Performance

- Assessment of both important
- HFA or SCD may have different profiles
- One may have stronger judgment skills vs. performance skills (or vice versa)
- Assessing both skills can:
 - Provide more details to understanding pragmatic profiles
 - Result in a more individualized plan
 - Produce a more effective plan

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Domains: Instrumental vs. Affective Intent

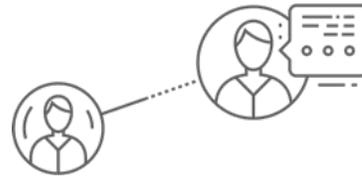


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Instrumental communication

Primary goal:

- Effective relay of information
- Communication used as means to an end
- Heavy focus on message
- Little focus on affective or emotional functions
- Often used in individuals with ASD



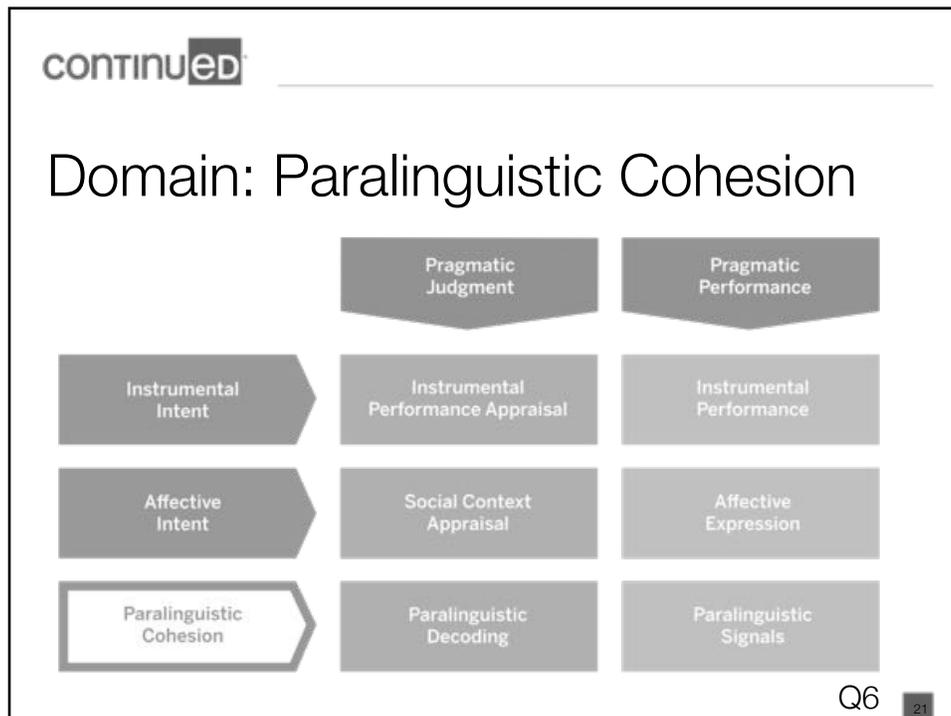
Q5

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Non-instrumental communication

- “Affective communication” → higher level communication skills
 - Expressing emotions to another person
 - Key component of nonverbal communication
 - Requires higher level thought processing
- Differs from instrumental intent
 - Not used as means to an end

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CONTINUED

Domain: Paralinguistic Cohesion

- Represents integrative interaction between ability to:
 - Detect speaker's intent by:
 - recognizing meanings of nonverbal cues
- Express various types of intent with help of nonverbal signals, such as:
 - Facial expressions
 - Tone of voice
 - Inflections in prosody
 - Gestures
 - Overall body language

Q6 22

Reading Nonverbal Cues

- A form of Pragmatic Judgment
- Measures ability to read facial expressions and nonverbal language
- Can suggest what a person is feeling and thinking without use of words
- Can reveal how person feels despite contradictory verbal message
- Appropriate reading of nonverbal language is critical in understanding another person
 - Leads to an appropriate verbal response

Q4

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Intonation



Utterance

Cindy got a new pair of sandals

Cindy got a new pair of sandals

Cindy got a new pair of sandals



Interpretation

She usually buys running shoes

Affirmative statement

Question



Q6

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CONTINUED

Nonverbal communication (cont.)

- An individual's ability to decode emotion from someone else's facial expressions has been associated with higher social competence (Egan, Brown, Goonan, Goonan, & Celano, 1998).
- Children are continually developing their ability to decode facial expressions and emotions until the age of ten, at which point their decoding skills match those of adults (Custrini & Feldman, 1989).

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Nonverbal communication (cont.)

Difficulty decoding nonverbal language such as reading facial expressions and prosody significantly affects:

- reading social context
- using social communication in real-life
- applying social thinking in real-life
- social reasoning

Q3

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Nonverbal communication (cont.)

- When trying to interpret an emotional facial expression, typically we focus our gaze on the other person's eyes and eyebrows.
- Previous studies have found that children with ASD tend to focus on the lower half of the face (i.e., mouth) in many social/emotional situations (Joseph & Tanaka, 2003; Dawson, Webb, Carver, Panagiotide, 2004).

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Nonverbal communication (cont.)

- Gepner et al. (2001) discovered that children with ASD were able to identify facial emotions when they were shown “strobe-like dynamic presentations” but demonstrated deficits in the processing of “normal-paced dynamic expressions.”

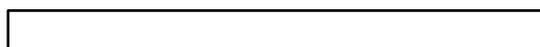
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Nonverbal communication (cont.)

- Mazefsky and Oswald (2007) investigated emotional facial and prosodic stimuli with students between the ages of 8 and 15 who presented with AS or HFA.
- The results of their study revealed that students with HFA were significantly impaired in identifying prosodic emotion expressions.



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CONTINUED

Nonverbal communication (cont.)

- There have been limited studies that have evaluated children's use of facial expressivity.
- A study conducted by Faso, Sasson, and Pinkham (2015) investigated facial expressivity in children with ASD compared to typically developing children.
- In this study, typically developing students and students with ASD were observed by naïve observers who evaluated intensity, naturalness, and emotional category of emotions.

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Nonverbal communication (cont.)

- ASD expressions were rated as “more intense” and “less natural” than typically developing students’ expressions.
- Faso, Sasson, and Pinkham (2015) concluded that the findings of their study highlight the differences, not reductions, in facial expressivity in students with ASD that may impact social interaction quality.

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Nonverbal communication: Prosody/Inflections (cont.)

- Children with ASD and AS have been described as having deficits in the use of pitch and volume, having monotone intonation, slow syllable-timed speech, rapid rate of speech, and using aberrant stress patterns (Baron-Cohen and Staunton (1994), Schriberg and McSweeney (2001).
- Further, individuals with HFA and AS appear to have similar prosodic productions, however, there are significant differences between these two groups and typically developing speakers (Schriberg and McSweeney (2001).

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Nonverbal communication: Prosody/Inflections (cont.)

- Previous research has provided evidence that individuals with ASD have difficulty recognizing emotions and mental states when listening to a speaker (Globerson et al. (2015), Rosenblau et al (2017).
- Mazefsky and Oswald (2007) investigated emotional facial and prosodic stimuli with students between the ages of 8-15 who presented with AS or HFA.
- The results of their study revealed that students with HFA were significantly impaired in identifying prosodic emotion expressions.

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CONTINUED

Nonverbal communication: Prosody/Inflections (cont.)

- Schelinski and von Kriegstein (2019) evaluated the relationship between vocal emotion and vocal pitch perception abilities in adults with HFA and adults with typical development.
- Adults in the HFA group were found to demonstrate less accurate perceptions of vocal emotion than the adults with typical development.
- Schelinski and von Kriegstein's study suggests that difficulties in vocal emotion recognition may be due to the difficulties of processing sensory features such as vocal pitch.

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Nonverbal communication: Prosody/Inflections (cont.)

- A study conducted by Rutherford et al. (2002) examined individuals with HFA and AS's ability to interpret the affective meaning of phrases.
- Individuals listened to dialogue from audio books that varied in prosody, vocal quality, loudness, speech rate, and pitch. The individuals were asked to listen and then pick one of two adjectives that best described what they heard.
- The results of Rutherford et al. (2002) study showed that when compared to typically developing, individuals with HFA and AS had difficulty judging the speaker's affective meaning.

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Video-based intervention

Use of produced video narrative teaching social communication skills

- Purpose: To teach ability to
 - Understand real-life social situations
 - Respond to real-life social situations
 - Presented in a video-based format



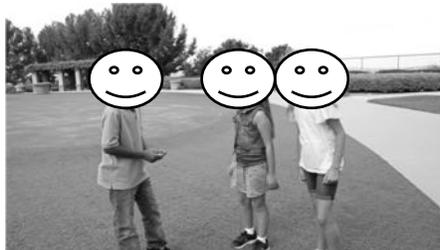
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Video-based intervention(cont.)

- Combines storytelling power of television
- Authenticity of real-life social situations
 - To obtain as naturalistic responses as possible
 - Powerful and prolific teaching tool
 - Both effective and time-efficient



Q7

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Video-based intervention (cont.)

A means for teaching persons with ASD or pragmatic communication disorders a “range of socially significant behaviors.”



(Rayner et al., 2009)

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Why Videos? (cont.)

Dr. Temple Grandin says, "I think in pictures. I do not think in language. All my thoughts are like videotapes running in my imagination. Pictures are my first language, and words are my second language (Grandin, 2002).

Why is Video Modeling so Successful?

- Increases the child's attention to the modeled task (Bellini, 2007)...most children immediately direct their attention to the television or computer screen. And if you do not have attention, you will not have learning."
- Individuals with autism often benefit from visually-cued instruction (Quill, 1997) and show strength in processing visual rather than verbal information
- Children with autism can visually process information better if they have borders around their visual fields...therefore making a TV and computer screen is a more effective way to learn a new skill. (Murray, 1999)

Video Modeling

- Video based approaches have been proven to be a successful way to teach social communication skills.
- During video model intervention, typically, a model (e.g., peer) demonstrates positive examples of a desired behavior (e.g., turn-taking, eye contact, etc.). Each video model targets a student's needs, wants, and preferences.
- For example, video modeling has been paired with strategies such as reinforcement to teach conversational skills in children with ASD.



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Previous Studies

- Spontaneous requesting (Wert & Neisworth, 2003)
- Recognizing emotions in speech and facial expressions (Corbett, 2003)
- Compliment-giving initiations and responses (Apple, Billingsley, & Schwartz, 2005)
- Language production (Buggey, 2005; Charlop-Christy et al., 2000)
- Conversational speech (Charlop & Milstein, 1989; Charlop-Christy et al., 2000; Nikopoulos & Keenan, 2003, 2004)

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Previous Studies

- Reciprocal play (Nikopoulos & Keenan, 2004)
- Motor and verbal play sequences (D'Ateno, Mangiapanello, & Taylor, 2003)
- Play-related comments (Taylor, Levin, & Jasper, 1999)
- Socio-dramatic play (Dauphin, Kinney, & Stromer, 2004; Nikopoulos & Keenan, 2003)
- Complying, greeting, and sharing (Simpson, Langone, & Ayres, 2004)
- Spontaneous greeting (Charlop-Christy et al., 2000)
- Social initiations (Nikopoulos & Keenan, 2004; Buggey, 2005)

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Video Modeling Studies

- Studies have demonstrated faster acquisition of social skills and increased generalization when using video (Charlop-Christy, Le, & Freeman, 2001).
- Video modeling has also been found to be an intervention that promotes independence in students with ASD (Hume, Loftin, & Lantz, 2009).
 - Has been found to be effective when working with children with Down's syndrome, ASD, language impairment, social communication impairment



Q8

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Peer Mediated Interventions

- Research has indicated social skills intervention for children and adolescents with ASD benefit from peer-mediated interventions (Bass & Mulick, 2007; Reichow & Volkmar, 2010) and peer mentoring (Morrison, Kamps, Garcia, & Parker, 2001).
- Peer-mediated interventions incorporate typically developing peers, such as classmates, into therapy to help target behavioral and social strategies (Bellini, Peters, Benner, & Hopf, 2007).
- Specifically, research data has suggested that children with high-functioning ASD may benefit from social connections with peers in general education classrooms.

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Peer Mediated Interventions (cont.)

Further, Morrison, Kamps, Garcia, and Parker (2001) investigated peer mentoring as a method for improving social skills for students with ASD. In this study, students with ASD and a group of general education peers were taught to use and monitor social skills while playing games to increase initiations and social interaction skills (e.g., requesting, commenting, turn-taking, sharing). The results of the study demonstrated an increase in the number of initiations and social interaction time with peers during intervention, as well as use of the targeted social skills.

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Based on research conducted at the Lavi Institute, we found that we can help power up social communication skills and overall social competence by teaching:

- Comprehension of social context cues
- Comprehension and use of affective language and non-instrumental intent
- Comprehension and appropriate use of nonverbal language

But how can we address these in therapy?

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CONTINUED

Question?

- What if we explicitly teach how to decode facial expressions? How?
- Would visual bombardment work?
- What would it look like?

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CONTINUED

Sample video

- Auditory visual bombardment



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Auditory Visual Bombardment

Targets:

- Comprehension of social context
- Paralinguistic signals
- Perspective taking
- Paralinguistic decoding

Q1

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Social Skills Squad Research Study #1

- To analyze effectiveness of a real-life video-based, peer-modeling approach for social communication deficits
- To analyze treatment outcomes in 2 clinical groups:
 - high functioning autism
 - social communication disorder

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Two Participant Groups

- Group Profiles (N=29):
 - 17 students with High Functioning Autism
 - 12 students with Social (Pragmatic) Communication Disorder
- Age Range:
 - 7:0 yrs. old -13:0 yrs. old (younger kids)
 - 13:0 yrs. old -18:0 yrs. old (older kids)



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Students with Social Communication Disorder (SCD)

Inclusion:

- Having a current diagnosis of social communication disorder (based on special education eligibility criteria or medical records)
- Obtained a standard score of ≤ 76 on the Clinical Assessment of Pragmatics (CAPs; Lavi, 2019) (subtests: Affective Expression, Paralinguistic Decoding and Paralinguistic Cues) and CASL 2 (subtests: Pragmatic Judgement, Meaning from Context, Inference)
- Attend public school
- Full-time general education classroom

Exclusion:

- Comorbid conditions (e.g., autism, mental health issues, personality disorders, general medical conditions)

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Students with High-Functioning Autism (HFA)

Inclusion:

- Having a current diagnosis of high-functioning autism spectrum (based on special education eligibility criteria or medical records)
- Obtained a standard score of ≤ 76 on the Clinical Assessment of Pragmatics (CAPs; Lavi, 2019) (subtests: Affective Expression, Paralinguistic Decoding and Paralinguistic Cues) and CASL 2 (subtests: Pragmatic Judgement, Meaning from Context, Inference)
- Attend public school
- General education classroom (min. 4 hrs)

Exclusion:

- Comorbid conditions (e.g., mental health issues, personality disorders, general medical conditions)

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Pre-Post Testing

- Pre and post treatment testing completed by using 3 subtests of the CAPs: social context appraisal, paralinguistic decoding and paralinguistic signals
- Participants were tested individually, in a separate setting, free from distractions
- Tested by CA licensed speech-language pathologists trained in the standardized administration of this pragmatic language therapy program



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Video-based test

- 3 Pragmatic Judgment subtests
- 3 Pragmatic Performance subtests
- 8 items per subtest
- Total of 48 items



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Study Design

- Pre-Post Testing
- The study lasted 6 weeks, 2x week
- Each study session lasted 30 min and consisted of small groups of 3 or less participants matched by age
- Treatment occurred in a quiet, separate room

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Study Design

- Study participants were seen in group therapy that targeted 5 social communication topics
- Through the continued visual bombardment of video-based peer modeling the student increased exposure to the understanding and judgment of social context in a practical age-appropriate situation.
- The skill was absorbed and the student participated in decision-making, role-play, and performance activities correlating to the targeted 6 areas.

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CONTINUED



Empathy



Sarcasm
Deceit
Bullying



Conversational
Adaptation



Accepting
Change,
Negotiations,
Compromise



Idioms and
Expressions

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CONTINUED

Conceptual Framework of the Study

- The ability to understand social cues is a pre-requisite skill for learning appropriate social skills:
 - *We focused on the ability to evaluate social context first and then moved on to performance in social situations.*
- The program was designed to address appropriate expression of affective intent and higher order social communication skills.

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Conversational Adaptation Goals

- Will demonstrate the ability to establish and maintain up to # turns on conversational topics of mutual interest
- Will demonstrate the ability to acknowledge his/her conversational partner's interests by asking up to # relevant questions or making relevant comments
- Will initiate and maintain (up to #) conversational turns around various topics outside of personal interest
- Will demonstrate the ability to interrupt conversations using socially appropriate apologies or excuses

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Empathy, Peer Support Goals

- Will demonstrate the ability to recognize disappointment, sorrow, sadness by correctly decoding facial expressions/vocal inflections/tone of voice and making relevant comments or asking relevant questions
- Will demonstrate the ability to recognize his/her conversational partner's needs (need for empathy, emotional support) by using relevant facial expressions and vocal inflections

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CONTINUED

Idioms and Expressions Goals

- Will demonstrate the ability to respond appropriately to comments containing idioms, expressions or metaphors or politely ask about their meaning if unfamiliar with them

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CONTINUED

Negotiations, Compromise, Accepting "No" Goals

- Will demonstrate the ability to express displeasure and/or accept "no", an unwanted answer, or a loss in a game using socially appropriate responses with adequate tone of voice and facial expressions
- Will demonstrate the ability to politely disagree or state opinion using socially appropriate responses, tone of voice and facial expressions

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CONTINUED

CONTINUED

Detecting Deceit, Sarcasm, & Irony Goals

- Will demonstrate the ability to recognize sarcasm, deceit and irony by correctly decoding facial expressions/vocal inflections/tone of voice and make relevant comments
- Will recognize implied communicative intent (e.g., sarcasm, deceit, irony) by correctly decoding facial expressions/vocal inflections and make relevant comments

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CONTINUED

Making New Friends, Selecting Friends, First Impressions, Goals

- Will demonstrate the ability to establish and maintain up to # turns on conversational topics of mutual interest
- Will demonstrate the ability to acknowledge his/her conversational partner's interests by asking up to # relevant questions or making relevant comments
- Will initiate and maintain (up to #) conversational turns around various topics outside of personal interest

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CONTINUED

Making New Friends, Selecting Friends, First Impressions, Goals (cont.)

- Will demonstrate the ability to interrupt conversations using socially appropriate apologies or excuses
- Will demonstrate the ability to recognize his/her conversational partner's state of mind/mood (by correctly decoding facial expressions and vocal inflections) by making relevant comments and/or asking relevant questions

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CONTINUED

Rule Based Program

The program was heavily rule based and focused on two key concepts: social mind and big heart

- Social mind refers to an individual's ability to read and detect social cues
- Big heart refers to an individual's ability to understand, be supportive and demonstrate mindfulness and empathy

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CONTINUED

"Social Mind" is one of the teaching tools to increase participants' awareness of social context, understanding of importance to assess social situations continuously and ability to detect meanings of facial expressions and vocal inflections.

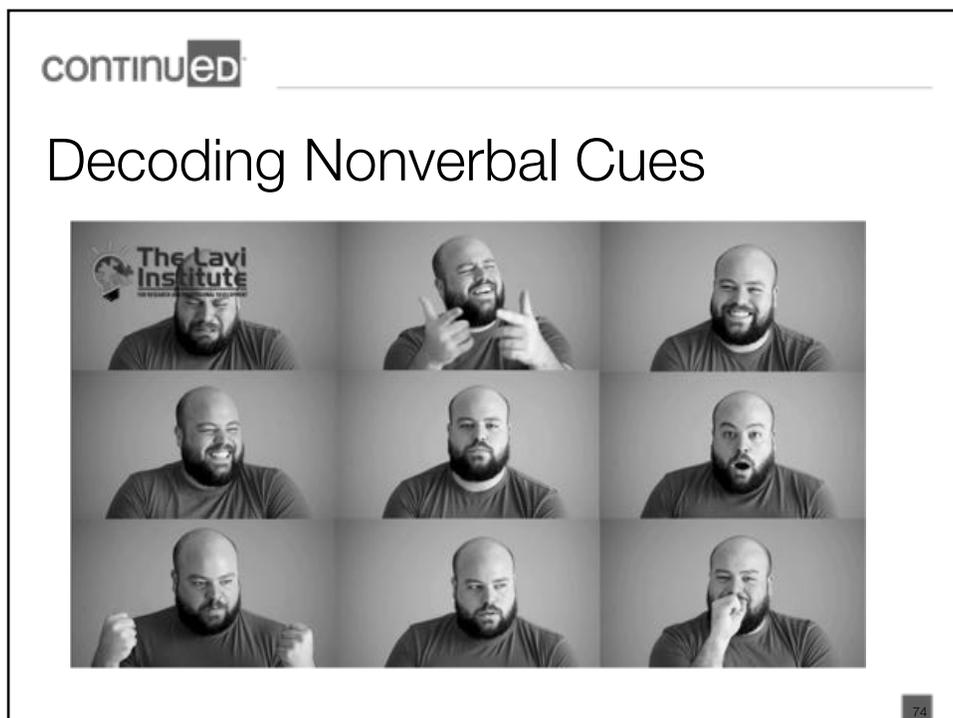
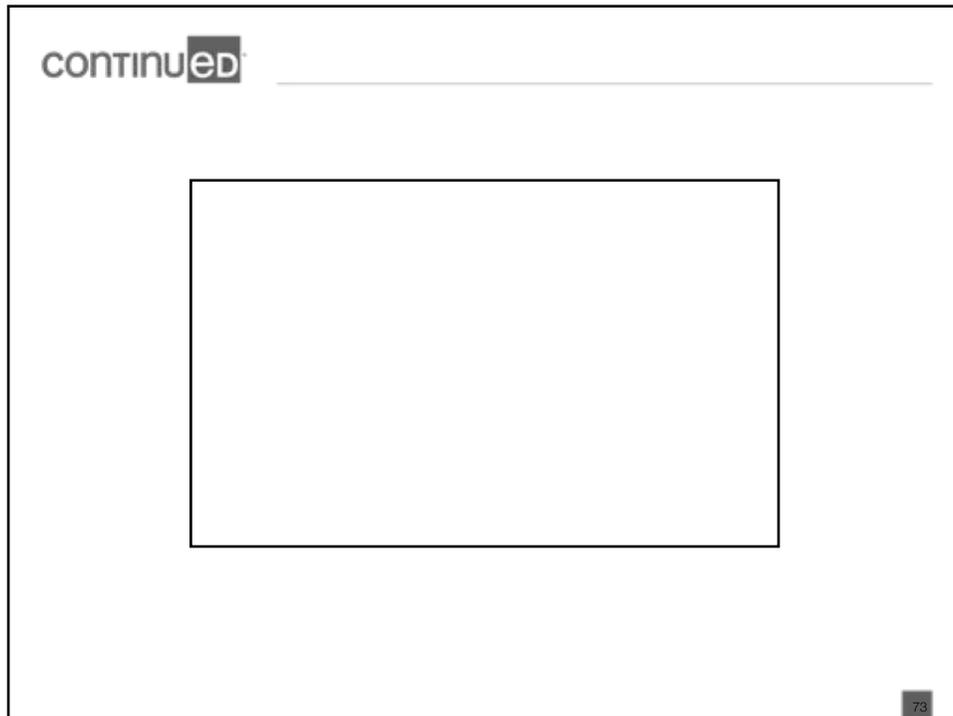
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"Big Heart" is one of the participant tools to increase the participants' awareness of pragmatic performance and affective expression (it requires expression of empathy and defining empathy).

In other words: using "Big Heart" to understand empathy when it is expressed in a spontaneous or natural way

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Previous Nonverbal Language Interventions

- Soorya et al. (2015) investigated the efficacy of Nonverbal communication, Emotion recognition, and Theory of mind Training (NETT) in children diagnosed with ASD aged 8 to 11.
- NETT is a manualized intervention that targets nonverbal communication and emotion recognition. NETT has a cognitive behavioral approach and uses activities such as skills training, relationship development intervention, and thought bubbles. Parent training and homework are also incorporated in the training.
- Soorya et al. (2015) found that nonverbal communication, empathic responding, and social relations improved immediately after treatment, however, no significant differences were found at three-month follow up.

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Previous Nonverbal Language Interventions (cont.)

- A study conducted by Thomeer et al. (2015) investigated the efficacy of the Mind Reading (MR) computer program in HFA children aged 7 to 12.
- MR aims to train students to decode facial expressions and prosody. MR training involves audio-visual stimuli of voices and faces to learn simple and complex emotions through observation of emotion expressions, structures lessons, quizzes, etc. The MR program also uses in vivo rehearsal trials throughout each session.
- This study found that students who received the treatment performed significantly better than the control group in regards to emotion decoding and encoding.

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Typical Session Outline

- Full topic introduction video - 5 minutes
- Peer Mentored Video
- Topic discussion of problem - 5 minutes
- Visual Bombardment: Review facial expressions & vocal inflections (non-verbal communication video) - 5 minutes
- Practice correct non-verbal(s) with selfie/mirror - 5 minutes
- Watch and discuss practice videos - 10 minutes
 - Role play of incorrect and correct social situations
 - Followed by asking, "What went wrong?" "What went right?" and "How do you know it went well?"
 - Ask perspective taking questions such as, "How did it make you feel?"

Typical Session Outline

- Full topic introduction video - 5 minutes

Typical Session Outline

- Peer Mentored Video

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Typical Session Outline

- Full topic introduction video - 5 minutes
- Peer Mentored Video
- Topic discussion of problem - 5 minutes

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CONTINUED

Typical Session Outline

- Visual Bombardment: Review facial expressions & vocal inflections (non-verbal communication video)
- 5 minutes

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CONTINUED

Typical Session Outline

- Practice correct non-verbal(s) with selfie/mirror-5 minutes

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CONTINUED

Typical Session Outline

- Tell Me What I'm Thinking

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CONTINUED

Typical Session Outline

- Practice correct non-verbal(s) with selfie/mirror-5 minutes
- Watch and discuss practice videos-10 minutes
 - Role play of incorrect and correct social situations
 - Followed by asking, "What went wrong?" "What went right?" and "How do you know it went well?"
 - Ask perspective taking questions such as, "How did it make you feel?"

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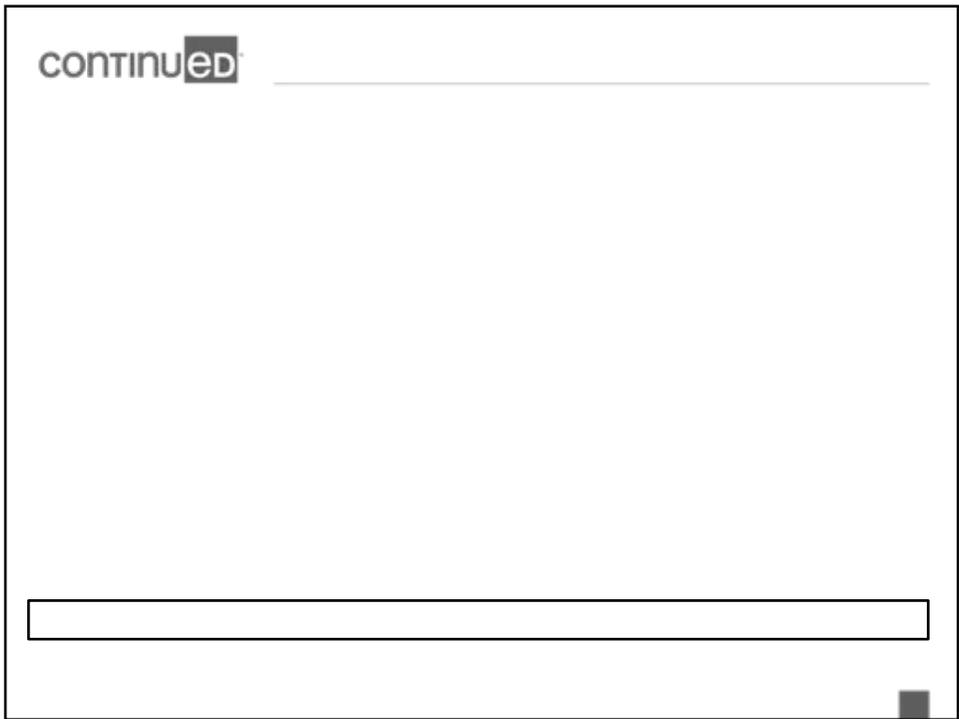


Study Results

- Both groups demonstrated improvements in pragmatic judgment and performance
- Video-based modeling showed to be beneficial for improving comprehension of social context and pragmatic performance (both verbal and nonverbal)

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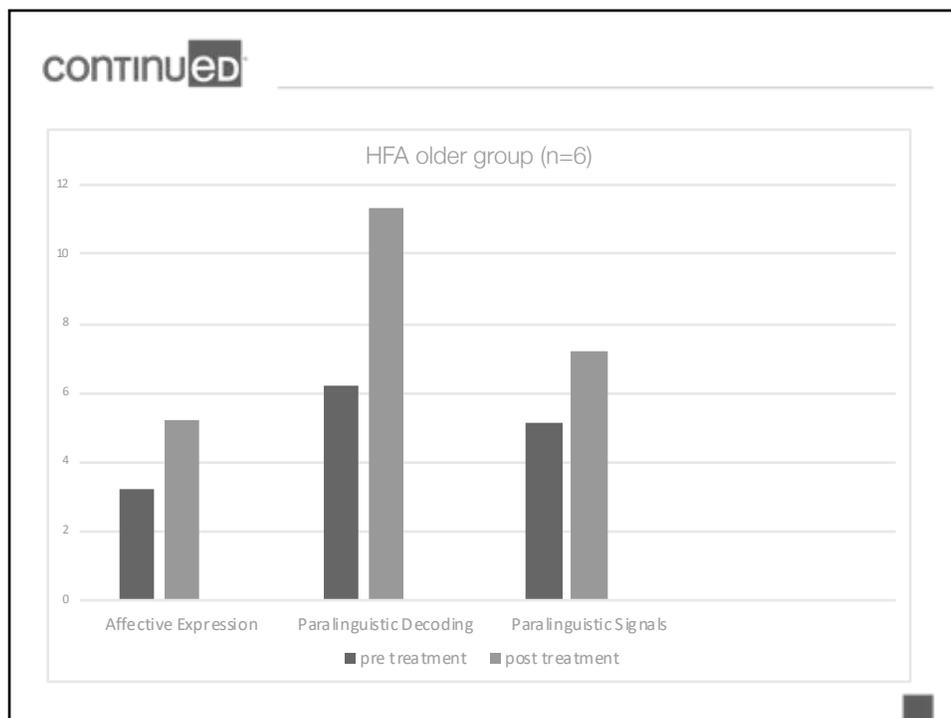
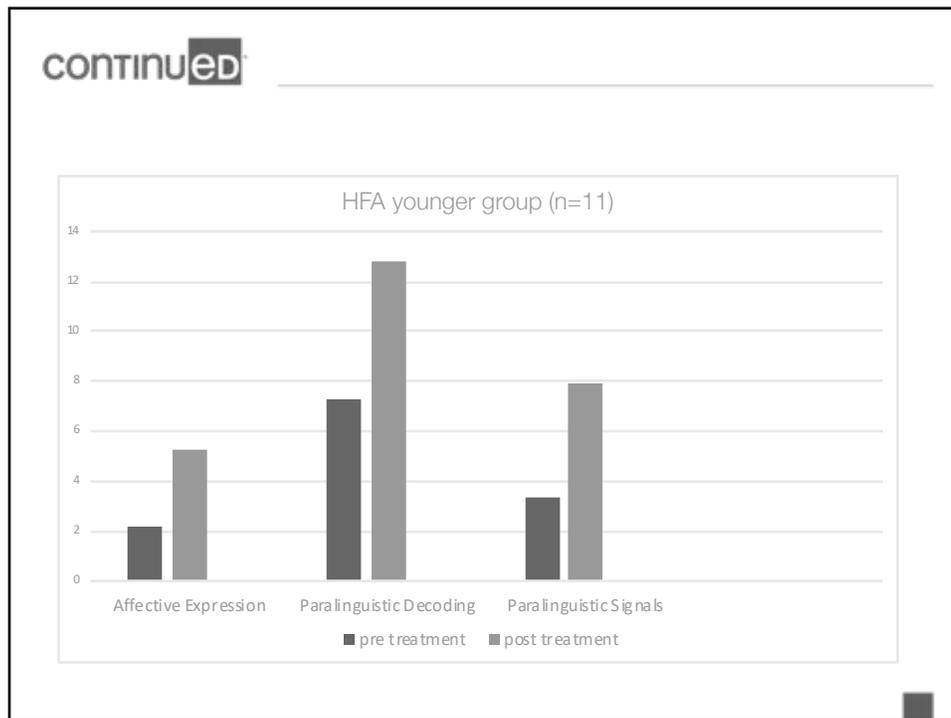
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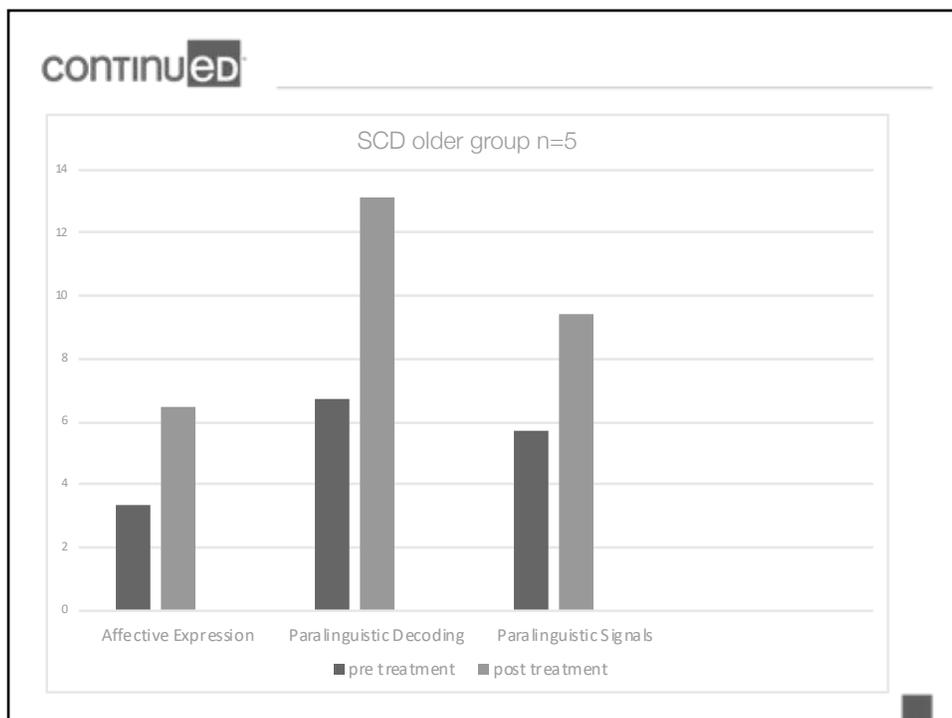
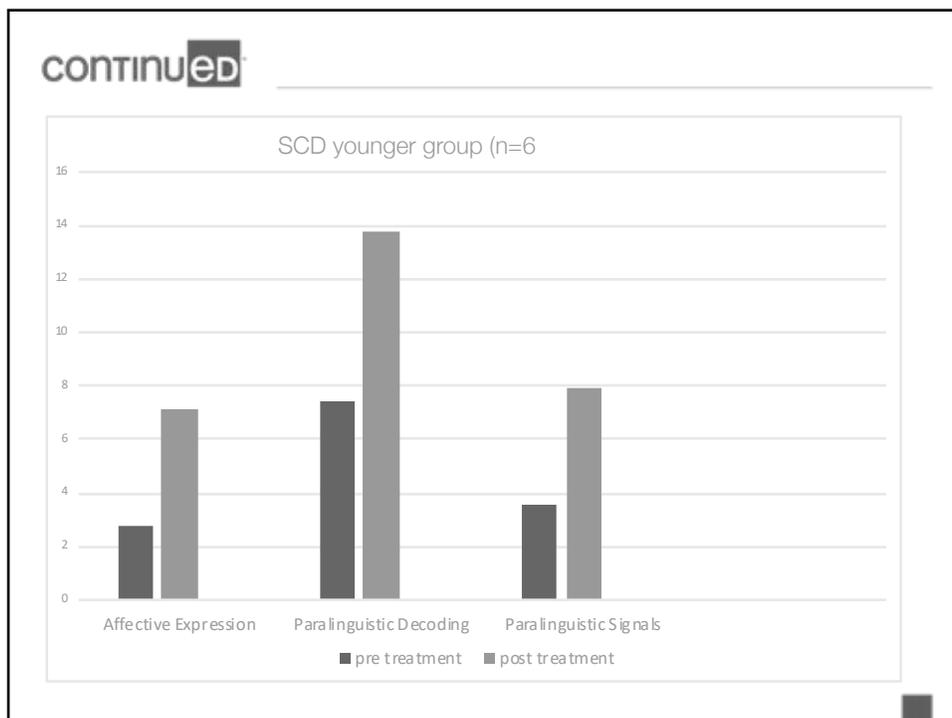


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Post-intervention unadjusted means and standard deviations for dependent measures for two groups with post hoc pairwise least significant difference comparison p values and estimated Cohen's d effect sizes

	Groups		Comparisons	
	SDC	HFA	SDC vs. HFA	
Nonverbal Language				
CAPs Paralinguistic Decoding F(2, 18) = 6.21, p = .008, $hp^2 = .412$	10.9 (1.24)	9.6 (1.17)	.003 (d=2.21)	
CAPs Paralinguistic Signals F(2, 18) = 5.54, p = .015, $hp^2 = .376$	7.9 (1.62)	5.9 (1.74)	.054 (d = 1.52)	
Social Language Comprehension				





Recommendations

- It would be beneficial to study the generalization and spontaneous use of these skills in everyday life
- It would be beneficial to study what the optimal number of treatment sessions and frequency of sessions is needed to achieve maximum participant success
- It would be beneficial to study the effectiveness of video-based modeling with other clinical groups

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And now, presentation of the 2nd research study we conducted

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Methods

- Thirty children between the ages of 9;0 (years; months) and 10;11 were randomly assigned to the VABI and VMI groups. They received 30-min group intervention sessions 2 times per week for 8 weeks. Social language comprehension and nonverbal language measures were administered to assess intervention outcomes pre and post-intervention.

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CONTINUED

Methods

- Eight similar-age children from the no-treatment group acted as a control group. Testing for these children was conducted during summer break, so the children in the CON group were not receiving school instruction. Children in the CON group were given the same measures as the children in the treatment groups, separated by a 8-week period of time.

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Methods

- Pre- and post-test assessments for all three groups were administered and were scored by a team of evaluators who were blind to group assignment and to the goals of the study.
- Thirty-eight children with pragmatic language impairment (PLI) participated in the study. Children were eligible to participate if they obtained a standard score of ≤ 76 on 3 CAPs subtests; Lavi, 2019) (subtests: Affective Expression, Paralinguistic Decoding and Paralinguistic Cues) and CASL2 (Carrow-Woolfolk, 2017) (subtests: Pragmatic Judgement, Meaning from Context, Inference) and attended general education classrooms for at least 4 hours per day.

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Methods

- None of the participants presented with hearing impairment, visual impairment, gross neurological impairment, oral-structural anomalies, or emotional disorders. Participants were excluded from the study if they presented with intellectual disability, learning disability, and/or emotional disturbance. Additionally, students who presented with co-morbid disorders as defined by the DSM-V such as personality disorders, mental health disorders, or general medical conditions were excluded from the study.

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Methods

- Intervention Procedure VABI. Children who were randomly assigned to the VABI group participated in a video modeling intervention that was heavily based on teaching nonverbal language cues. The VABI was structured around activities involving auditory and visual bombardment of facial expressions and vocal inflections and teaching their meanings.
- A critical difference between the VABI and VMI programs related to teaching of meanings of nonverbal language through use of auditory and visual bombardment of various facial expressions and vocal inflections.

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Pre-intervention means and standard deviations for dependent measures for three participant groups: visual auditory bombardment intervention group (VABI), video modeling intervention (VMI), and a no-intervention control group (CON).

	Group							
	VABI						CON	
	M	SD		M	SD		M	SD
Nonverbal Language								
CAPs Paralinguistic Decoding	8.6	1.2		9.2	0.9		8.8	1.3
CAPs Paralinguistic Signals	5.7	1.8		5.3	1.5		4.9	1.7
Social Language Comprehension								
CAPs Social Context Appraisal	10.7	1.2		11.3	1.6		10.9	1.8
CASL2 Pragmatic Language	23.4	2.4		22.8	2.6		22.5	1.9
CASL2 Idiomatic Language	4.6	1.7		3.9	2.1		4.2	1.5
CASL2 Nonliteral Language	5.6	2.2		6.1	1.6		6.3	2.1

	Group			Comparisons	
	VABI	VMI	CON	VABI vs. CON	VMI vs. CON
Nonverbal Language					
CAPs Paralinguistic Decoding $F(2, 18) = 6.21, p = .008, \eta^2 = .412$	10.9 (1.24)	9.6 (1.17)	8.9 (1.39)	.003 ($d = 2.21$)	.261 ($d = 0.04$)
CAPs Paralinguistic Signals $F(2, 18) = 5.54, p = .015, \eta^2 = .376$	7.9 (1.62)	5.9 (1.74)	5.2 (1.67)	.054 ($d = 1.52$)	.322 ($d = 0.30$)
Social Language Comprehension					
CAPs Social Context Appraisal $F(2, 18) = 3.65, p = .035, \eta^2 = .289$	12.3 (1.4)	11.5 (1.5)	10.8 (1.9)	0.15 ($d = .91$)	.568 ($d = -0.38$)
CASL2 Pragmatic Language $F(2, 18) = 6.45, p = .007, \eta^2 = .424$	25.8 (2.8)	23.2 (2.3)	22.8 (2.1)	.003 ($d = 1.24$)	.247 ($d = 0.24$)
CASL2 Idiomatic Language $F(2, 18) = 5.42, p = .018, \eta^2 = .379$	6.8 (1.5)	4.9 (2.2)	4.3 (1.2)	.028 ($d = .94$)	.265 ($d = -0.40$)
CASL2 Nonliteral Language $F(2, 18) = 6.42, p = .007, \eta^2 = .421$	8.7 (2.1)	7.4 (1.4)	6.4 (1.8)	.011 ($d = 0.91$)	.355 ($d = 0.21$)

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Results: Both interventions were associated with statistically significant gains on social language comprehension measures when compared to a no-treatment condition. Effect size analyses demonstrated that the VABI group outperformed the VMI group on all outcome measures.

Conclusion: The results revealed signs of higher efficacy in an intervention approach in which clinicians treated multiple targets using meaningful activities with high levels of visual and auditory bombardment of nonverbal language cues.

Q2 

Questions?

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