How to Use Video and Other Technology-Based Interventions with Students with Autism

2nd ANNUAL RICHARD L. SIMPSON CONFERENCE on AUTISM

OCTOBER 10th, 2019

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https://tinyurl.com/yck544ax

Turn and chat with someone in your general proximity. Tell them a little about your current role and what interested you in this workshop.

Session Overview

- What is video-based instruction?
- Why use video instructional tools for students with Autism?
- Types of Video Based Techniques
  - Video Modeling
    - Video Self-Modeling
    - Video Others Modeling
    - POV Modeling
  - Video Feedback
  - Video Prompting/Video Priming
  - Social Emotional Learning via Video
- Combining Video-Based Approaches with Other Evidenced Based Practices
- Other Associated Technology Interventions

Workshop Outcomes

At the end of the workshop, attendees will be able to:

1. explain a rationale for using technology to teach and support students with autism by aligning the characteristics and strengths of autism with technology components

2. summarize the legal and evidence-base for using technology with students with autism

3. describe at least 5 strategies to address potential barriers to implementing technology with students with autism

Workshop Outcomes

At the end of the workshop, attendees will be able to:

4. list at least 5 apps and/or websites and explain why they would be effective tools or supports for students with autism

5. explain the steps in planning, creating, using and evaluating video instruction with students with autism

6. create their own videos (e.g., video modeling, video prompting, etc.) using a smartphone, iPad or other devices and/or computers to target skills and behaviors for students with autism

Technology and Evidence-based practice

IDEA factors

EBP reviews

NPDC, NAC, etc.

Online Tools

AIM, AFIRM, etc.

NPDC

Technology-aided Instruction and Intervention (TAII)*

Previously Computer Aided Instruction and Speech Generating Devices

Technology-aided instruction and intervention (TAII)	Instruction or interventions in which technology is the central feature supporting the acquisition of a goal for the learner. Technology is defined as "any electronic item/ equipment/ application/or virtual network that is used intentionally to increase/maintain, and/or improve daily living, work/productivity, and recreation/leisure capabilities of adolescents with autism spectrum disorders" (Odom, Thompson, et al., 2013).	9	11

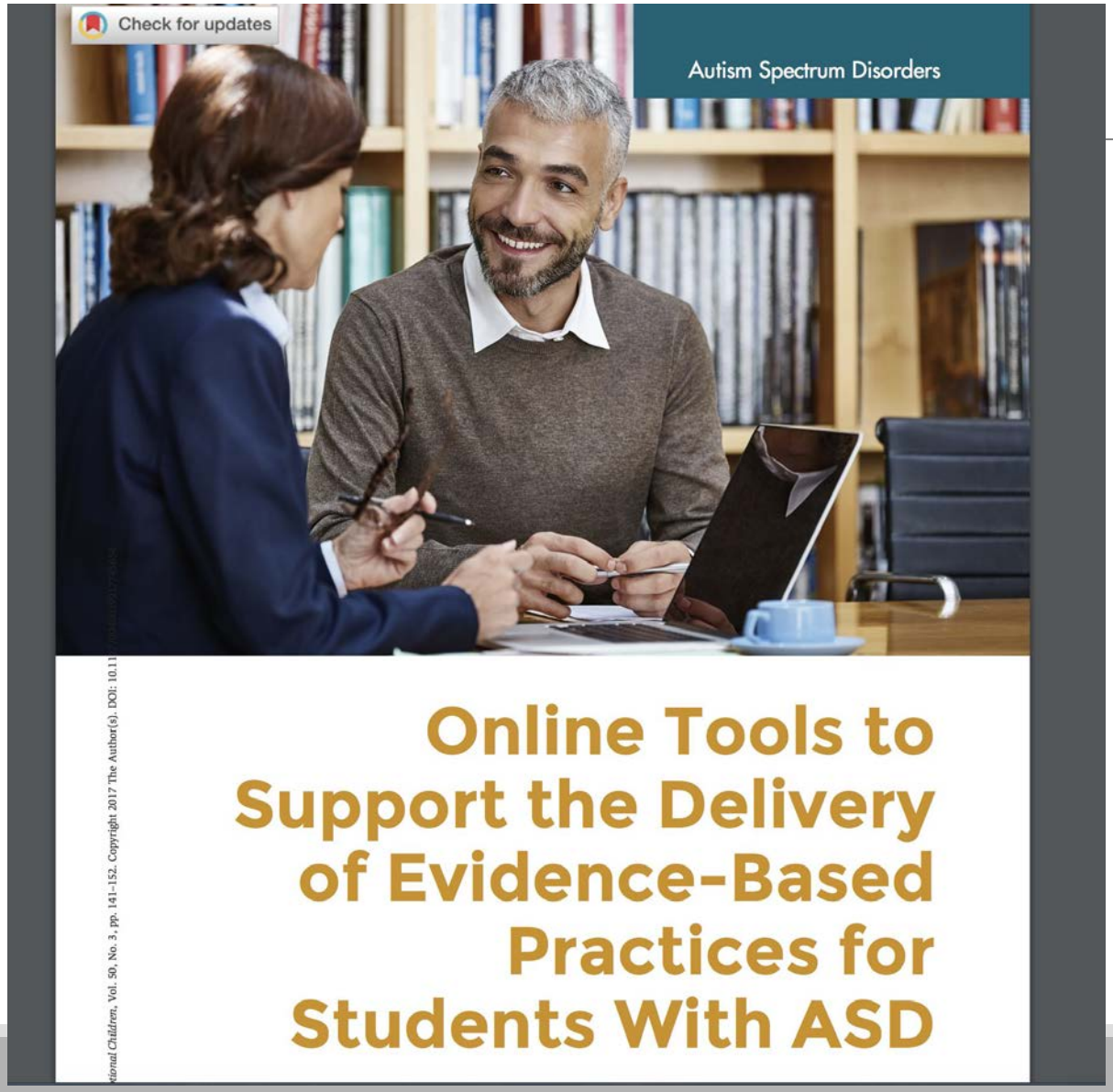
NPDC

VM

Video Modeling (VM)

Video modeling (VM)	A visual model of the targeted behavior or skill (typically in the behavior, communication, play, or social domains), provided via video recording and display equipment to assist learning in or engaging in a desired behavior or skill.	1	31

CEC Online Tools Article



https://militaryfamilieslearningnetwork.org/wp-content/uploads/2019/04/EBP-for-ASD.pdf

Video-Based Instruction

A loosely connected collection of techniques that deliver different types of instruction (e.g., modeling, prompting, self-reflection/self-evaluation) via video technology.

- Video Modeling
- Video Feedback
- Video Prompting/Priming
- Combining Video Based Approaches with other EBP

Why Use Video Instructional Tools?

They appear to work (e.g., they appear to influence behaviors of interest)

They are often preferred by students with autism Cardon, & Azuma, 2012

They are consistent Bellini & Akullian, 2007

They are efficient Charlop-Christy, Le & Freeman, 2000

Appear to align with how students with autism learn

Repetition

Combine with other practices

State of the Evidence for Video Based Tools

Both the National Autism Standards Project and the National Professional Development Center on Autism Spectrum Disorders list video modeling as an Evidence-Based Practice

Other video based supports (prompting, feedback) have promising levels of evidence supporting their use for students with Autism see Canella-Malone, O'Reilly, & Sigafoos, 2006; Cihak, & Alberto, 2006; Thieman, & Goldstein, 2001

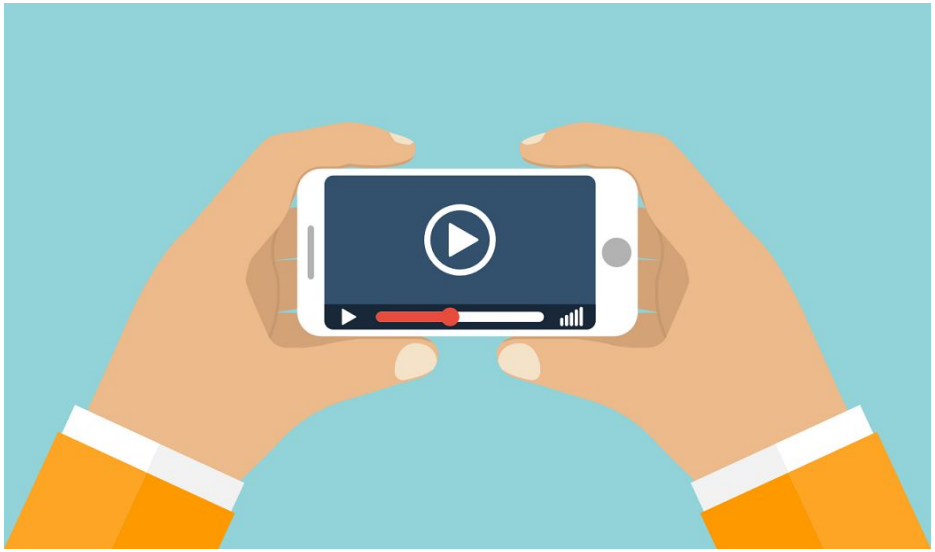
Key Takeaways

Matching intervention outcomes and components to student needs and characteristics

Assessing potential risk factors

Decision making with other stakeholders

Carefully examining the effectiveness of intervention/strategy effectiveness



Video-Based Instruction

Turn and chat with someone in your general proximity. Talk with them about any specific video based approaches that you have used. What worked? What didn't? How did the student(s) respond?

Video-Based Instruction

A loosely connected collection of techniques that deliver different types of instruction (e.g., modeling, prompting, self-reflection/self-evaluation) via video technology.

- Video Modeling
- Video Feedback
- Video Prompting
- Other

What is Video Modeling

"A behavioral technique that utilizes videos rather than live scenarios… to expand the learners ability to memorize, imitate, or generalize and adapt targeted behaviors" (McCoy, & Hermansan, 2007, p. 183).

Types of Video Modeling

- Video Self-Modeling (VSM)
- Video Modeling With Other as Model (VMO)
- Point-of-View Modeling (POV)

Video Self-Modeling

Video of the student successfully implementing the target behavior

- Two types
  - Positive Self-review
  - Feedforward

Dowrick, 1999; McCoy & Hermansen, 2007; Shukla-Mehta et al.,2010

Video Self-Modeling: Positive Self-Review

- Video showing successes of desired behavior
- For behaviors already in the students repertoire but not consistently used (performance deficits)
- Capture footage of student (often extended amounts) and edit out everything except positive exemplars

Dowrick et al., 2006; Hitchcock, Prater, & Dowrick, 2004

Video Self-Modeling: Feedforward

- Provides students with an "*image of future mastery*" (Dowrick et al, 2006)
- Prompt individual to engage in skill and then edit out prompts (hidden supports)
- Video clips of components of skill and then merge together into one video clip

Dowrick, 1999; Dowrick, Kim-Rupnow, & Power, 2006;
Hitchcock et al., 2003

Video Modeling with Others as the Model

- Video exemplars are provided by “actors”
  - Adult
  - Peer
  - Known or Unknown
- Requires creation of a script and careful planning, coaching, and directing
- Some elements we discussed in “self-review” may apply here

Dowrick, 1999; Dowrick, Kim-Rupnow, & Power, 2006;
Hitchcock et al., 2003

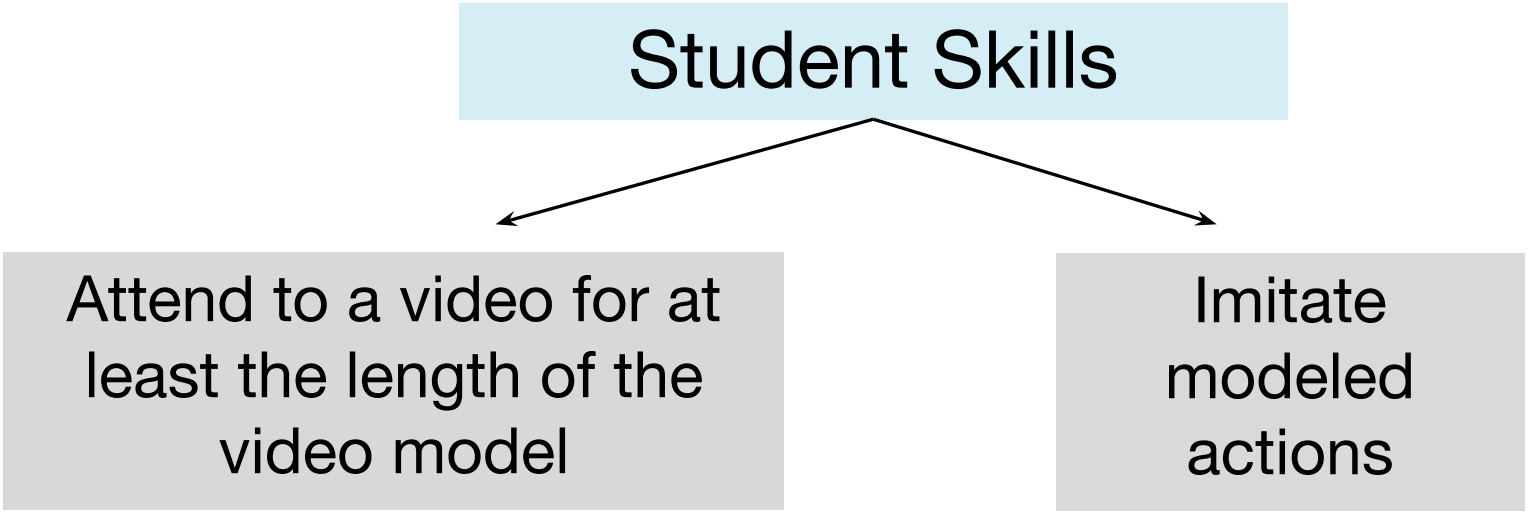
Point-of-View Video Modeling

First person perspective

- Actor's face not seen in the video
- Holds some advantages over Video Modeling other and Video Self-Modeling (target behaviors where perspective matters)

Dowrick, 1999; Dowrick, Kim-Rupnow, & Power, 2006; Hitchcock et al., 2003

Prerequisite Skills Necessary to Benefit from Video Modeling



Behaviors Targeted by Video Modeling Research

Functional Skills
- Personal Hygiene
- Purchasing Items
- Laundry
- Cooking a Meal

Play
- Imitation
- Sharing

Appropriate Behavior
- On-Task
- Transitions
- Following Directions
- Reduction of Problem Behavior

Social Skills
- Initiations/Greetings
- Responding to Peers
- Conversation Skills
- Playing with Others
- Requesting/Social Communication

Video Modeling Examples

Creating Video Models

VSM

- Determine behavioral targets
- Determine which type
- <u>Positive Review:</u>
  - Record video in settings were behavior is likely to occur
  - Edit out non-examples
- <u>Feedforward:</u>
  - Record “engineered” activity
  - Provide necessary prompts to student
  - Edit out prompts

VMO

- Determine behavioral targets
- Recruit stakeholders
- Task analyze behavior
- Create script (if necessary)
- Record video clips (corresponding to task analysis)

POV

- Same as above
- Find a way to capture POV sequences

Features of High Quality Video Models

Accurate Demonstrations of the Target Behavior

Ideally video models should demonstrate examples of the target behavior. Models should show:

- DESIRED behaviors
- Realistic representations of these behaviors in natural settings
- Focus/highlight on particularly necessary components of the behavior

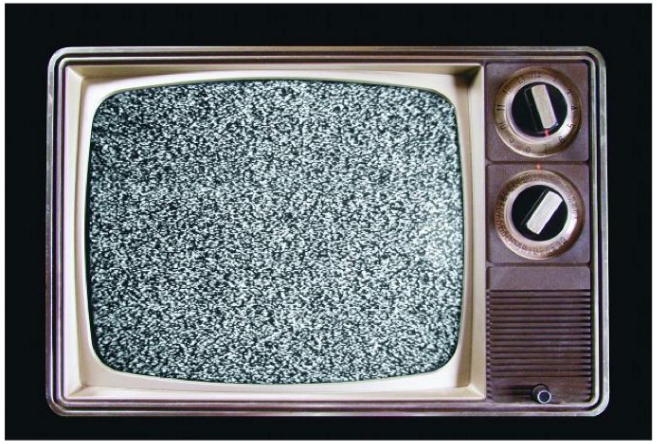
Features of High Quality Video Models

= 1-3 minutes

Ideally video models should demonstrate clear and concise examples of the target behavior. Consider these areas when determining length of the video model.

- Complexity of the target behavior
- Attending capabilities of the student
- Setting

Features of High Quality Video Models



Consider Quality of Final Product

The quality of the video should not detract from the model. Consider these simple solutions for higher quality videos

- Tripod
- Microphone

Features of High Quality Video Models

Limit the Distracting Details

While it makes sense to use simple text and narration (depending on the student), limiting effects (transitions, music, or filters) and other extraneous stimuli is a good rule of thumb.

Choosing Equipment

Cameras

Never before have everyday people had access to such quality video recording devices. MUCH easier to record, edit, and export video models (and its only going to get easier).

$50-????

Trouble Shooting Video Modeling

- Is the student attending to the video?
- Is the student able to make meaning of the video?
- Is the behavior demonstrated succinctly?

- Package with:
  - Reinforcement
  - Self-management
  - Try video prompting

(Deichtman, 2010; Crutchfield, Weber, & Simpson, 2013)

Developing and Editing Video Models - Demo

Guided Practice

Choose a target behavior that makes sense for our space

- raising hand
- active listening/note taking
- tying shoes
- appropriate in seat behavior

Video Feedback

Video Feedback

- A video instructional technique in which students watch a video of themselves and evaluate their own behavior
- Generally used to address social performance or other more complex skills
- Novel approaches incorporate broader video clips (i.e., from popular culture)
- Should include formal feedback routines
- Control over the medium appears to offer great benefit

(Deichtman, 2010; Crutchfield, Weber, & Simpson, 2013)

Self Evaluation Routines

- Often we must teach students with ASD to self-evaluate
- Discrimination training
  - Example/non-example
  - Incidental teaching in naturally occurring environments
  - Reinforce accuracy
- During training use video-taped behavioral rehearsals or other video exemplars

Examples of Self-Evaluation Routines

Self-Evaluation….

	1. I responded to my name.		
	2. I listened to my friend when they were speaking.		
	3. I waited my turn to talk.		
	4. I answered my friend fast.		
	5. I looked at my friend when talking to them.		
	6. I gave my friend a good answer.		
	7. I used nice words.		

_____'s Problem Solving Sheet

What happened?

What was the social mistake? Who was hurt by this mistake?

How do you think this mistake make them feel?

What could you do next time, to avoid this mistake?

During the Game
I……..

- ❑ Waited my turn
- ❑ Used a nice tone of voice (even if losing)
- ❑ Followed the rules
- ❑ Asked for help if needed

Examples of Self-Evaluation Routines

Self-Evaluation Form

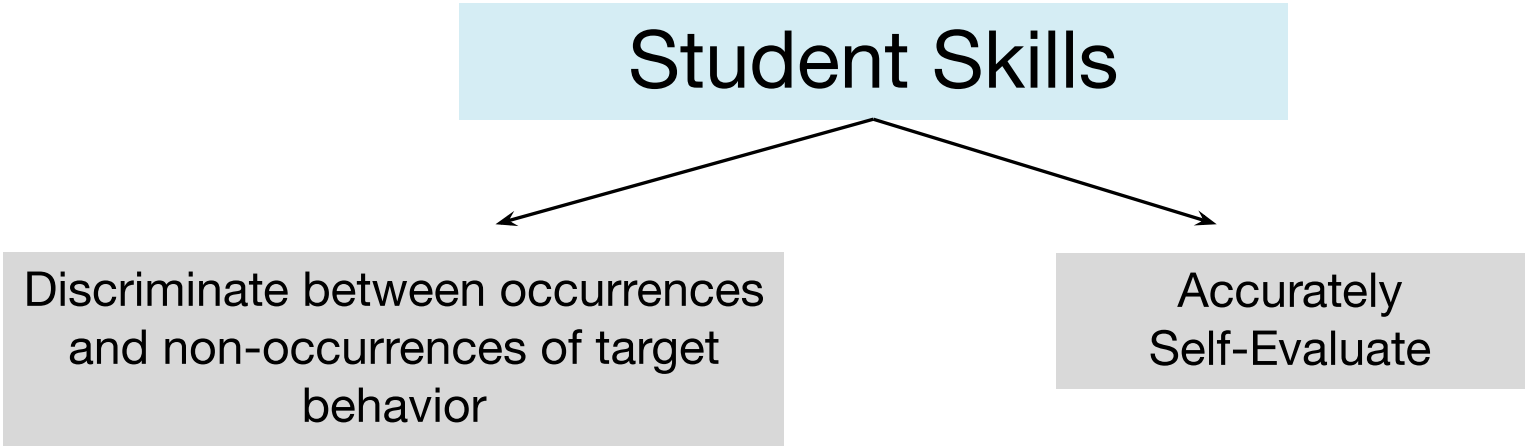
		😊	☹
	1. I listened to my friend when he was speaking.	👍	👎
	2. I answered his questions	👍	👎
	3. My answer was on-topic	👍	👎
	4. I gave a nice long answer	👍	👎
	5. I used nice words	👍	👎

Student Rubrics to Rate Video Performance

Complimenting

Bad Complimenting	OK Complimenting	Good Complimenting
Ø Rude or mocking compliments Ø Rude voice tone or volume Ø Rude body language	Ø Something that you might think is a compliment, but sounds rude Ø Compliment that has nothing to do with the current situation Ø Poor body language (not looking at the person)	Ø Nice relevant compliment Ø Genuine compliment Ø Looking at the person Ø Nice body language Ø Nice voice (tone and volume)
0	1	2

Prerequisite Skills Necessary to Benefit from Video Feedback



Appropriate Targets*

Complex/Abstract Social Skills

- Voice tone
- Social initiations
- Body language
- Reciprocal conversations
- Asking and answering questions
- Matching voice tone and volume to situation

Play Behavior

- Turn taking
- Following game rules
- Sharing
- Listening to others

Implementation Protocols

Video Development

- Identify target
- Record behavior in natural setting
- Edit unwanted or unnecessary footage

Feedback Routine

- Watch video all the way through
- Re-watch video priming students to watch for certain things
- Student completes self-evaluation
- Provide error correction by returning to the video footage when necessary

Troubleshooting Video Feedback

- Is the student able to accurately discriminate occurrences/non-occurrences of behavior?
- Is the student able to accurately provide self-feedback?
- Does the video contain too many distracting elements?

- Package with:
  - Reinforcement
  - Behavioral rehearsals
  - Peer instruction
  - Try video modeling

Guided Practice

Think of student that you work with that might benefit from this approach. Spend a minute thinking about how you might design the self-evaluation materials and the feedback routines. What behaviors might you target?

Video Prompting

Video Prompting

- A video instructional technique in which students are shown brief clips of discrete behavior as a prompt to engage in that behavior
- Akin to task analytic instruction, where each step in the task analysis is represented by a video clip
- These clips can be chunked over time
- Video prompting can be a precursor to video modeling

Implementation Guidelines

Identify targeted skill

Create a task analysis

Record a video of each step in the task analysis

Embed the video clips in a choice board app or Go Talk Now

Develop a corresponding task analysis or visual support (in case the student ”gets lost”)

Use error-correction and prompting procedures as necessary

Steps:
A. OPENING A SHARED DOCUMENT
1. Turn on the Chromebook
2. Sign in with your Google account
3. Open Google Drive
4. Click on "Shared with me"
5. Double-Click on the document to open it
B. MAKING A PERSONAL COPY
6. Click "File" tab
7. Click "Make a copy"
8. Highlight the words "Copy of"
9. Type your full name
10. Click "OK"
C. MOVE INTO A NEW FOLDER
11. Click on the folder icon
12. Click on "Create new folder"
13. Type "School"
14. Click "Create"
15. Click "Move"
D. SHARING YOUR DOCUMENT
16. Click "Share"
17. Type email address
18. Click the "Can edit" arrow
19. Click "Can view"
20. Click "Send"

VIDEO PROMPT

VIDEO CHUNK

Gasser, Kirschner, & Crutchfield, 2016

Appropriate Targets

Chained Tasks

- Tying shoes
- Making lunch
- Riding the bus
- Transitioning between activities
- Accessing technology
- Academic applications

Video Prompting Examples

Video Prompting Demo

Guided Practice

Choose a target behavior that makes sense for developing video prompting (chained task). Ideas include:

- raising hand
- tying shoes
- writing name

Combining Video Based Approaches with Other EBP

- Easy to see how video based approaches might be used in conjunction with other evidenced based practices
  - Self-Management
  - Power Cards
  - Social Stories
  - Classroom Expectations
  - Others?

Self-Management

- Some research to support this (e.g., Crutchfield et al., 2015)
- Videos were used to help students learn to discriminate between occurrences and non-occurrences of the behaviors being monitored during a self-management routine
- Similarly students could also learn to rate other features of their behavior using this mode of example/non-example training

Self-Management

- Could also be used to model the desired monitoring behavior
- For example: students could watch a video of themselves navigating (answering monitoring prompts, recording behavior, etc.) a self-monitoring system independently

Power Cards

- High preference pedagogical agents could be embedded in the videos
- This could be done loosely to enhance engagement to the video models
- It could also be done more systematically (essentially a video delivered power card intervention)

Social Stories

- Cihak (2012) and colleagues used video social stories™ in which students were videotaped reading a social story and then acting out some of the relevant replacement behaviors.
  - "It is important to keep my head up during math class. [Teacher name] will give me a math worksheet at the end of class to see what I know. I will work on the math problems and try to solve the math problems. If I need help, I will raise my hand and wait for [teacher name] to come and help me. After [teacher name] helps me I will return to my work immediately. It is important to stay on-task and complete the math worksheet so my teachers can help me learn more."
  - Students then modeled working on a math sheet, raising their hand for help, and then returning to their math worksheet.

Social Stories

- Another approach that makes a lot of sense would be for social story to be developed according to best practice protocols and then a corresponding or companion video model showing the desired behaviors discussed in the social stories

Video Representation of Classroom Expectations

- While it is essentially a form of video modeling (demonstrating a desired behavior via video), using video to represent classroom expectations as a classwide tier I intervention makes sense and has some support from research (Lang et al., 2009).

Guided Practice

Take a moment to think about practices in your classroom that you think might be enhanced by videos. Be prepared to share out.

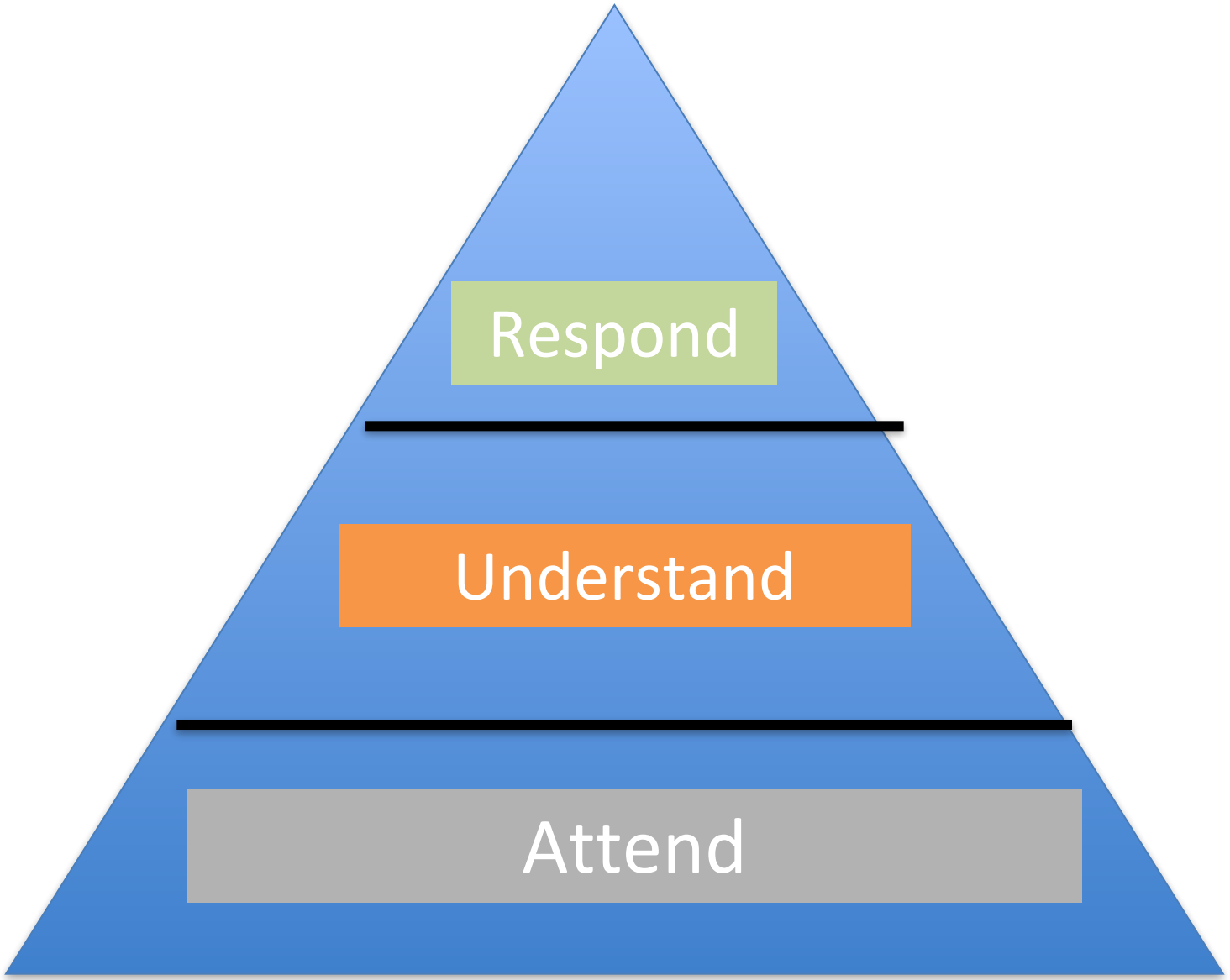
Example of Combining Video Model

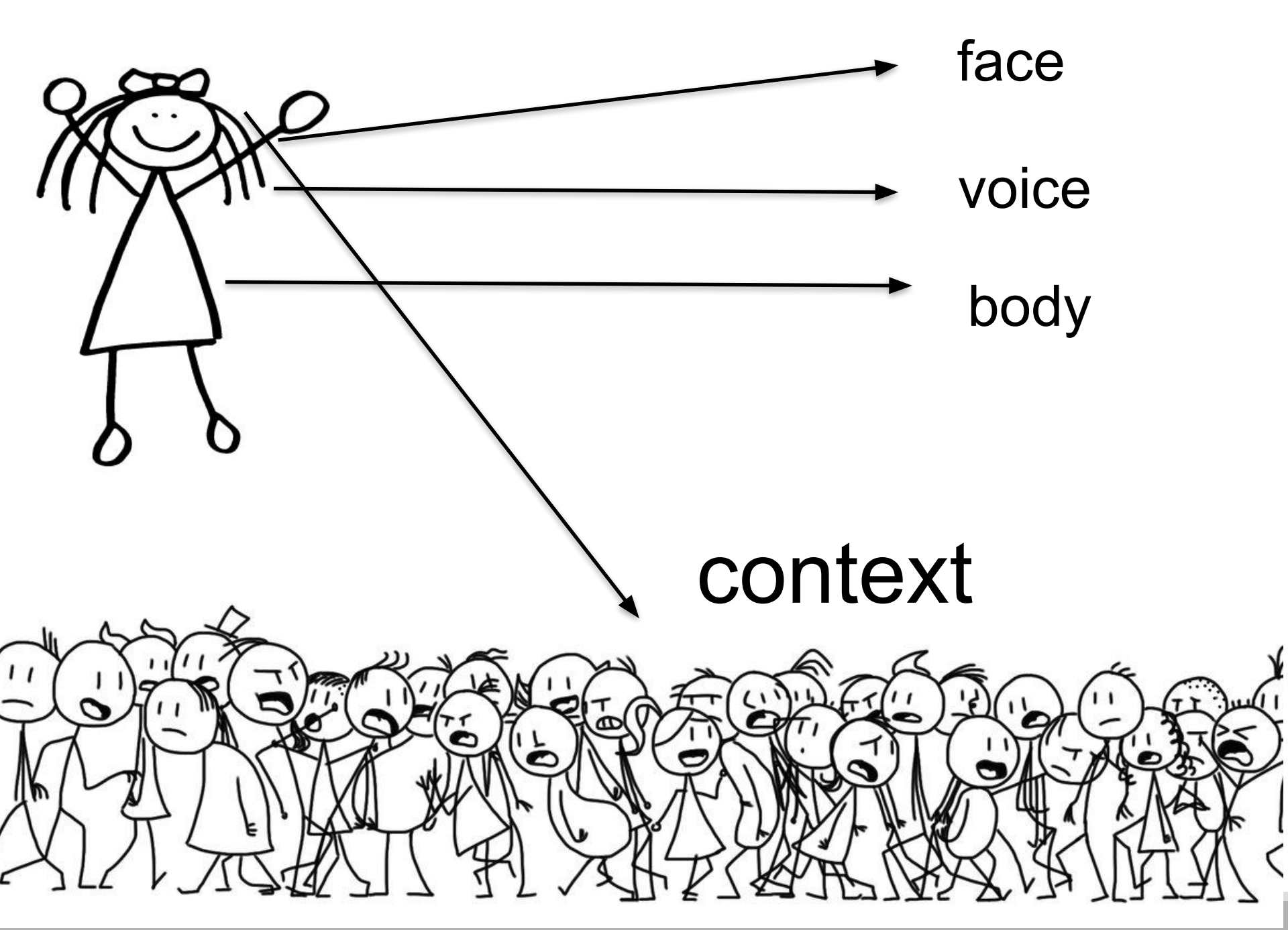
Emotion Recognition

- Importance in ASD
- Challenges due to many facets
  - Social understanding
  - Integrating senses
  - Sensory overload
  - Other
- Evidence from research, self-report, etc.
- Developmental and spectrum considerations
- Implications

(APA, 2013; Capps et al., 1992; Golan et al., 2006; Golan et al., 2008; Grandn, 1999; Jones & Klin, 2013; Kuusikko et al., 2009; Mahler, 2015; Uljarevic & Hamilton, 2012)

Emotion Recognition




face
voice
body
context

Teaching ER with Traditional Methods

- Direct instruction

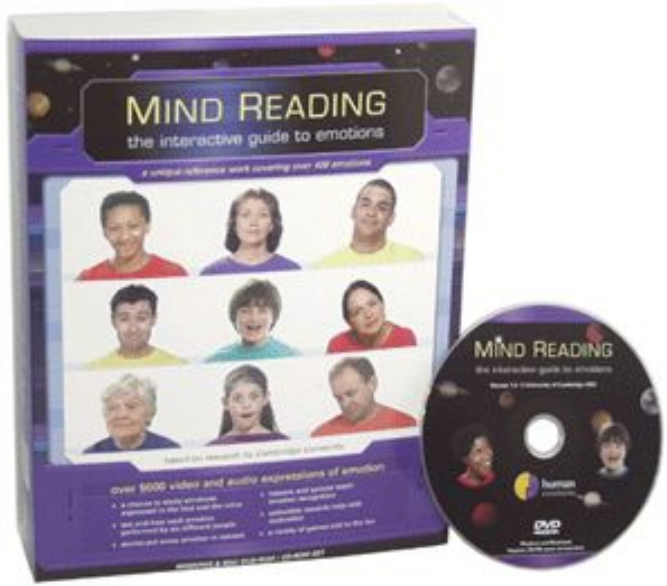
- Discrete trial
- Social skills groups
  - Good but…
    - Limited generalization
    - Motivation
    - Learning styles

Teaching ER with Technology

- computer programs/games
- commercial videos
- virtual reality
- video modeling
- video detective
- other

Mind Reading: The Interactive Guide to Emotions

Baron-Cohen, Golan, Wheelwright, & Hill, 2004



excited emotion

4 of 10

definition : very happy and enthusiastically looking forward to something good that is going to happen

simple definition : you want something to happen a lot

similar emotions : thrilled

images | stories | voices | info | notes



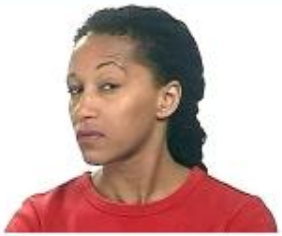



reward

Sally is feeling kind

1

2



3

watch the videos, who is feeling kind, 1,2 or 3?

hidden face

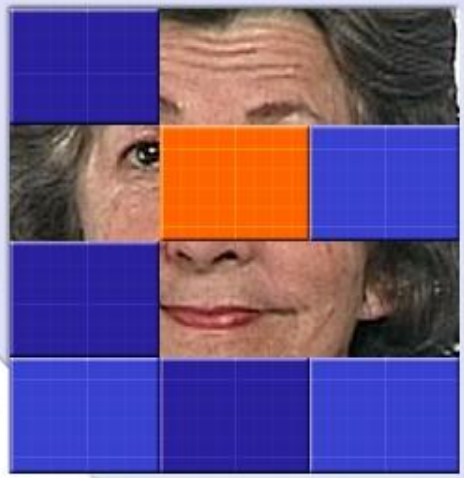
GAMES ZONE

YOUR SCORE

60

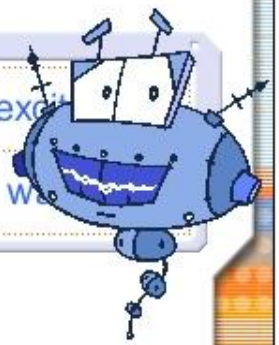
TOTAL SCORE

70



STOP

bothered	nervous	lonely	jealous	exc
wanting	moody	greedy	romantic	w



main

menu

Mind Reading - Research

- Initial British studies highlighted gains in ER in adults and children with ASD (Golan & Baron-Cohen, 2006; Golan et al., 2008)

- Findings from U.S. studies have shown ER gains with some anecdotal evidence of generalization (LaCava et al., 2007; LaCava et al., 2010; Thomeer et al., 2011; Weigner & Depue, 2011)

The Transporters

https://www.youtube.com/watch?v=8kU_CQGWBs

(Changing Media, 2006)

The Transporters

- DVD with 15 short videos and quizzes
- Addresses basic and more complex emotions
- British English and North American versions
- https://www.cambridgeautismlearning.com/ ~$25

The Transporters - Research

- 3 published foreign studies to date
  - Golan et al., 2009 - England
  - Young and Posselt, 2011 – Australia
  - Williams et al., 2012 – Australia
- Mixed findings

The Transporters - Research

- Golan et al., (2009) found that using the DVD significantly improved emotion recognition skills for young children with HFASD
- Young and Posselt (2011) replicated Golan's work with similar success
- Williams et al., (2012) only found improvements in ER of anger and their participants had more cognitive impairment

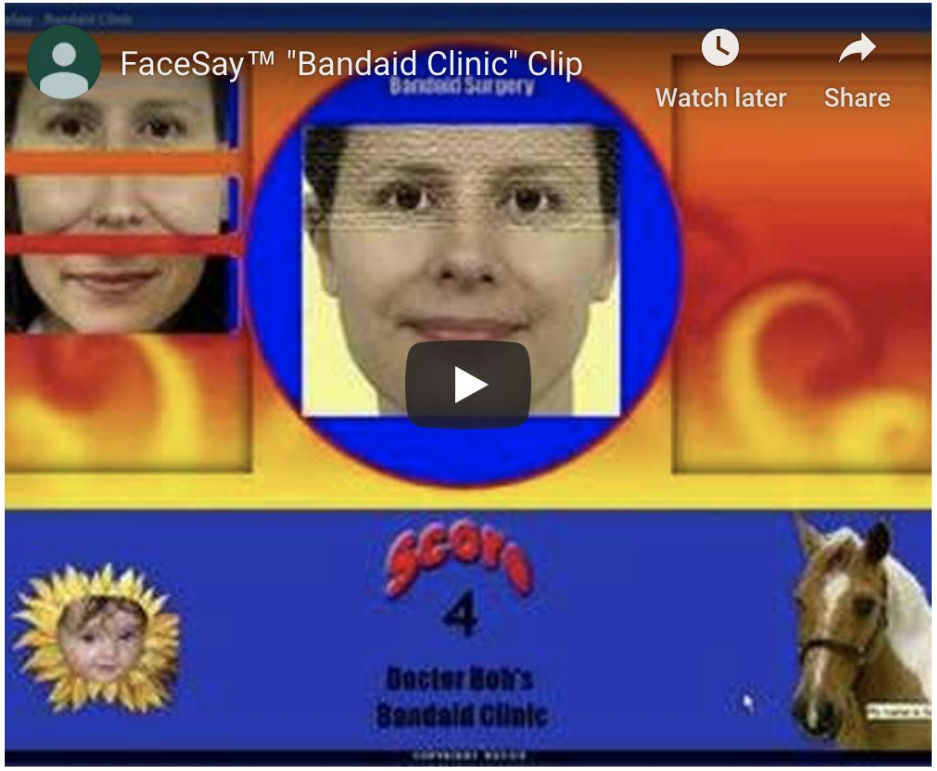
The Transporters - Research

- LaCava et al.'s (2016) pilot study found that using the DVD significantly improved emotion recognition skills for 12 children ages 4-10 with ASD
- Anecdotal reports from children, parents and teachers support the DVD as a motivating tool
- Several reported that children increased use of emotion vocabulary and began to pay more attention to faces and to situations that evoke emotional responses

Face Say™ computer software

https://www.youtube.com/watch?v=UX-_ri7QBzo

~$79



Face Say™ computer software

- http://www.facesay.com/index.html
- To teach where to look for social cues on faces by three different games…
  - Band Aid Clinic
  - Amazing Gazing
  - Follow the Face

Face Say™ - Research

- In randomized controlled trial, students who used Face Say had improved social initiations and eye contact and has less inappropriate behaviors. (Hopkins & Biasini, 2007)

- Claims to be first study of social skills software to show generalization to natural setting (the playground)

Emotiplay

An Interactive online emotion training program for children with autism.

promo video ~$10 per month

EmotiPlay
Emotion Games

Emotiplay - Research - Fridenson-Hayo et al., 2017

Cross cultural evaluation

6 - 9 year olds with ASC

8-12 weeks of intervention

improvements in face, voice, body, and integrative ER tasks teaching ER from faces, voices, body language, and their integration

Virtual Reality

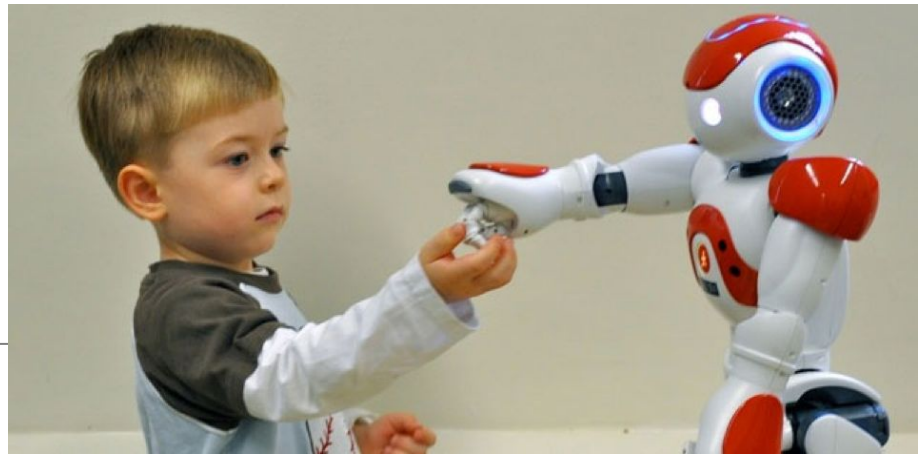
- Didehbani et al., 2017 - used Second Life™ with 30 children ages 7 – 16 with ASD
- Coach provided ongoing feedback
- Interacted with peer with ASD
- 5 week intervention – 2 hours per week

Virtual Reality

- Found improvements on ER, social attribution, and executive function
- Results are promising given that they did not specifically train for ER

(Didehbani et al., 2017)

Robots

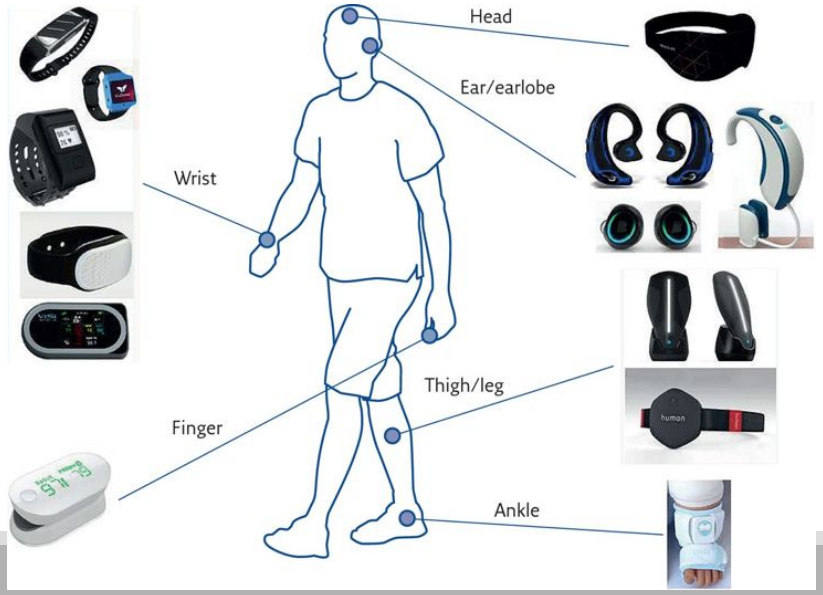


http://www.foxnews.com/tech/2017/12/03/south-carolina-children-with-autism-say-classroom-robot-is-too-cool.html

https://www.reuters.com/article/us-britain-autism-robots/british-robot-helping-autistic-children-with-their-social-skills-idUSKBN1721QL

Body Feedback – Wearables

- To increase awareness of heart rate
- help self-regulation
- Pulse Oximeter
- Fitbit
- Apps
- others



Video Modeling

- Make specific to student
  - Target skill
  - Consider length
  - Context
- Use whichever type fits – VM, VSM, POV, Prompting
- Can buy commercially
  - Corbett, 2003
    - case study of 8 y.o. with autism
    - acquired 4 basic emotions after VM intervention

Video Detective

- Use of tv shows, movies, etc.
  - 3rd Rock, Big Bang, etc.
- Fit for age/development
- Prime/point out cues
- Repetition
- Look for successes and challenges
- Make connections

(Myles & Aspy, 2016)

Combining Video-Based Approaches with Other Evidenced Based Practices

Use Video and Other Technology-Based Interventions with Students with Autism

Summary

- IDEA tech mandates
- use of EBP
- Importance of adult/peer supports, mediation, prompting, etc.
- Vet website/product claims

Summary

- Practice
- Motivation
- data-based decision making
- social validity
- Individualize!

Thank you!

Contact:

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