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Video based intervention for children with ASD using iPads™ and mobile technology

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Learning Objectives

After this course, participants will be able to:

1. List the scope of video based interventions.
2. Describe the perceptual phenomena reported in children with ASD.
3. Describe at least 3 ways to use mobile technology for video-based interventions.
4. Describe a dynamic concept and demonstrate a way that video technology can support the teaching of that concept.

Video based intervention

- The use of video based intervention is a broad term that includes: video modeling, video prompting, video self-monitoring, computer-based video instruction and video priming. (Rayner, C., et al. (2009))
- Video recordings are used to illustrate a desired target behavior as an independent variable.
- These videos can be viewed and reviewed.

Now it's just easier for the everyday clinician…

Visual Processing in ASD

Dakin and Frith explore the three classes of perceptual phenomena have repeatedly been associated with autism spectrum disorder (ASD):

- Superior processing of fine detail (local structure), has been robustly demonstrated.

Dakin, S. and Frith, U., (2005).

Three classes of perceptual phenomena have repeatedly been associated with autism spectrum disorder (ASD):

- Inferior processing of overall/global structure and/or an ability to ignore disruptive global/contextual information research is not consistent.
- No studies examine the abilities of global grouping performance that use stimuli that entirely prevent the observers using local grouping on spatial frequencies to perform the task.

Three classes of perceptual phenomena have repeatedly been associated with autism spectrum disorder (ASD):

- Impaired motion perception is well documented but the magnoscellular / dorsal deficits are not sufficient explanations. Abnormalities in the superior temporal sulcus (STS) may provide a neural basis for the range of motion-processing deficits observed in ASD, including biological motion perception.
- Such an explanation may also provide a link between perceptual abnormalities and specific deficits in social cognition associated with autism.

Guidelines for making behavioral videos

In building a personal library of video modeling supports on a person's handheld device, it is important to pay attention to basic production values.

- **Brevity**: Videos should be short and address just one behavior. Strive for one minute or less, when possible. It is easier for a user to tap on a new task video than it is to scroll through a longer video for the next cue.
- **Close-ups**: Remember that the device playing back the video may be palm-sized, so it is a good idea to use close-ups.
- **Lighting**: Make sure that good lighting is available.
- **Steady hands**: When possible, prop the video recording device on a table or at least try to hold it as steady as you can while recording; no one likes to watch a video that seems to have been shot on a boat in a pitching sea.
- **Audio Prompts**: Consider are you using verbal step-by-step task or directional cues.
- **Storing the video**: Be sure to give the video an appropriate title, such as "make lunch", so the user can readily scroll to it on the device when needed and consider HIPPA compliance.
- **Partnering**: Where possible it is good to collaborate with the end user in making the video. See if he/she can act in the video or help with shooting or editing. This can improve user buy-in for independently accessing the video when needed.

Video modeling

- Video Modeling is supported as an established treatment intervention to develop communication, higher cognitive function, interpersonal skills, personal responsibly and play for learners 3-18 by National Standards Project, (2009) from National Autism Center.
- National Professional Development Center on ASD, 2008.
- Peer-video modeling is an effective method in teaching:
  - Social behaviors/ social skills, play skills and social language
  - Functional Skills / Activities of daily living such as: toilet training, bathing
  - Instrumental activities of daily living (IADLs)
  - Increasing consistency of compliant / appropriate behaviors

Video Modeling EBP

- Video modeling has been found to be an effective intervention for teaching children with autism to make play comments toward their siblings. (Taylor, B., et al (1999).
- Video modeling is a promising method for promoting social skills. (LeBlanc, L., (2003)
- Video modeling develops perspective taking. (Charlop-Christy, M. (2003)
- VSM was used to encourage prosocial behaviors and to reduce problematic behaviors displayed by an adult with ASD. Results reveal a decrease in the tendency to invade others' personal space and make inappropriate loud noises. (Tsui and Rutherford 2014)

Who can model?

- Peers, siblings, parents, clinicians or the child can be featured on video performing the target behavior.
- Segments for movies or TV shows.
- Point-of-view or first person videos.
- No significant differences have been found comparing 'self' vs 'other' as a model.
- Pre-made videos, e.g. Model me going places, Social skills builder

- Consider written permission when using students and peers.

Video prompting

- Video prompting is a form of video modeling in which the participant is shown a video clip of one step of the task and then given the opportunity to complete that step before the next step is shown.
- The video prompts are often filmed from the perspective of the participant and thus have a subjective viewpoint.
- The supporters of video prompting claim that it has been used to teach a wide variety of social and functional skills, such as how to interact with other people or how to buy things.
- Video prompting can be used to teach an individual how to apply previously learnt behaviors and skills in new settings.

Video prompting

An iPad™ based picture and video activity schedule was used to teach shopping skills across community locations.

- Visual cues and video prompting substantially increased the participant's shopping skills.
- Skill increases maintained after the intervention was withdrawn.
- Shopping skills generalized to two untaught shopping items.
- Social validity surveys suggested that the participant's parent and staff favorably viewed the goals, procedures, and outcomes of intervention.

Burckley E., Tincani M. and Guld Fisher A. (2014)

Video prompting

Apps that can utilize video prompting as a feature:

- Look2learn 'Video Scheduler'
- First Then Visual Schedule HD
- Visual Planner
- AutisMate365 / TeachMate365
- Book Creator
- Aurasma

Video self-modeling

- Feature the child in the video – this has innate challenges as you are attempting to get the child to do a behavior that is not yet in their repertoire but can be achievable when providing them with specific directions and strong reinforcers.

Video priming

- Priming: to prepare an object so that we can do something specific with it.
- In education, it means preparing a person for an event that will happen in the future. This is done by making the upcoming event or activity more familiar and predictable, hopefully reducing stress and anxiety about the upcoming event. It aims to ease stress of transitions and unfamiliar activities.

- Show a video of the upcoming activity.
- Understand that priming is not considered teaching, so a child does not need to master the activity. You just want the child to become familiar with some aspects of the activity in a relaxed, no-pressure situation.
- Often use point-of-view of a person going through the transition situations. The camera filmed the transition situation at the child's eye level. (No people were shown in the videos). (Schreibman et al.)

Computer Based Video Instruction

- Also called 'Computer Assisted Intervention' or 'Multimedia Teaching' involves interactive presentation via a variety of media, text, music, pictures and video.

Computer-based activity programs have been used to improve:

- fitness levels
- problem solving skills
- social skills
- social language

Apps for computer assisted intervention that use video

- Social Express
- Between the lines 1, 2 and 3
- Puddingstone

Use of video to explain and explore dynamic principles

- Verbs
- Prepositions
- First, next and last

Teaching prepositions

- A class of words that express relationship. Locative or directional.
- Understanding prepositions is important to students as these concepts are needed for many skills:
  - ➢Following directions
  - ➢Requesting
  - ➢Expanding commenting skills

Developmental Acquisition:

- up-down
- on-off
- in-out
- over-under

Tomasello

- in, on
- under
- off-out of
- away from

Wiig and Semel

Children need to learn how prepositions function as part of language that relates to their experiences.

Children with autism have difficulty with prepositions due to the whole part focusing issues. These relationships are challenging for children with Autism Spectrum Disorders.

Teaching prepositions

Teaching prepositions

- I preposition builder app - static cartoon image
- YouTube - dynamic live video
- You need to teach prepositions in at least 12 different ways to support generalization of concepts.
- Where clients have more language use specific explanation about the parts of the preposition to draw attention to the whole picture.

Using a VSD app for prepositions

Teaching reading

- Hyperlexia: is characterized by advanced word-recognition skills in individuals who otherwise have pronounced cognitive, social, and linguistic handicaps. A degree of this should be viewed as part of the normal variation in reading skills.
- Children with Autism who have literacy skills may develop Hyperlexia.

Increasing iconicity in AAC

The correspondence between form and meaning.

- Add environmental sounds to animated symbols. (Harmon et al 2014)
- Use video connected to the icon for teaching then fade the video.

Conclusion

- Offer social validity. Typical kids watch videos for leisure.
- Video as a medium improves stimulus control and attention.
- Non-invasive approach to treatment.
- Less staff time therefore decrease long term costs.
- Easier to ensure instructional consistency.

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