

Augmentative and Alternative Communication Supports for Individuals with Autism



Janice Light, Ph.D.

The Hintz Family Endowed Chair in Children's Communicative
Competence

Professor of Communication Sciences and Disorders
Pennsylvania State University

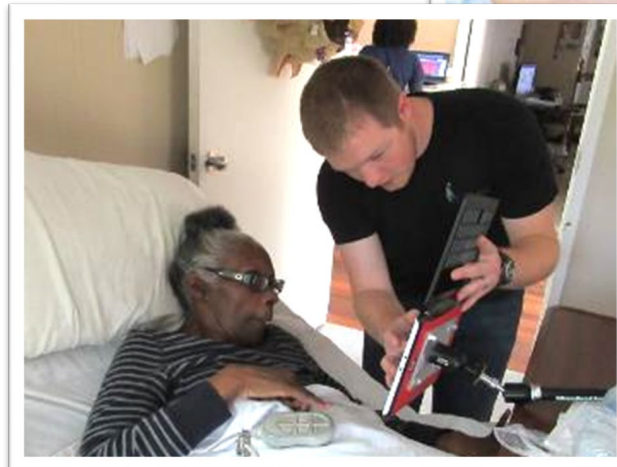
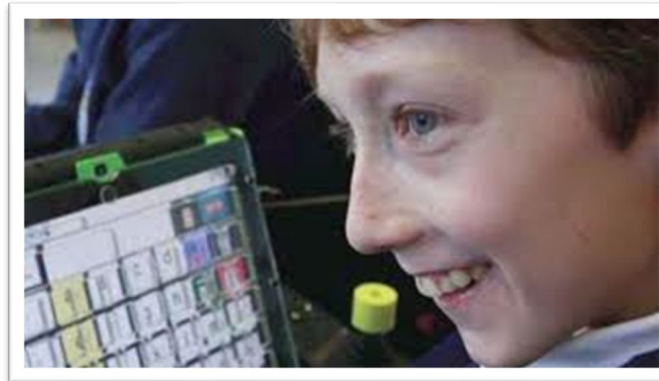
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Penn State University
Director, RERC on AAC
JCL4@psu.edu



The need

- More than 5 million Americans have complex communication needs such that they cannot rely on speech⁴
- More than 97 million individuals worldwide
 - Across the life span
 - With a wide range of needs & skills
 - Including individuals with autism



The challenge

- With limited access to speech, these individuals are severely restricted in their participation in society
 - Education
 - Employment
 - Health care
 - Family
 - Community living



Augmentative and Alternative Communication

- AAC offers the potential to
 - Enhance communication
 - Comprehension
 - Expression
 - Increase participation for individuals with complex needs
- AAC involves a wide array of tools, strategies, & techniques
 - Unaided AAC
 - Aided AAC
 - Low tech
 - High tech



Rehabilitation Engineering Research Center on AAC



- Our NIDILRR-funded RERC on AAC conducts
 - Research to advance knowledge & improve outcomes
 - Development to improve AAC technology solutions
 - Training to build capacity with service providers & technology developers
 - Dissemination to reach all stakeholder groups
 - To expand “what is possible”
 - To ensure “what is possible” becomes “what is probable”

Our vision

- Ensure that all individuals, including those with the most complex needs, have access to effective AAC technologies & interventions to realize
 - the basic human need,
 - the basic human right, and
 - the basic human power of communication



Effects of AAC for individuals with autism

- Research demonstrates that AAC intervention
 - Enhances communication
 - Increases participation
 - Enhances language development
 - Decreases challenging behavior
 - At no risk to speech development
 - AAC enhances speech production^{11, 12, 13, 16, 18, 26, 31, 34, 35, 39}



Ensure equal access to AAC

- Positive effects of AAC predicated on equal access to AAC
 - Sufficient intensity to attain meaningful gains
- Black children with complex communication needs receive less AAC intervention than their white peers³³
 - 35% of white children received <60 min of AAC intervention per week
 - 65% of Black children received <60 minutes
 - Insufficient to attain meaningful gains



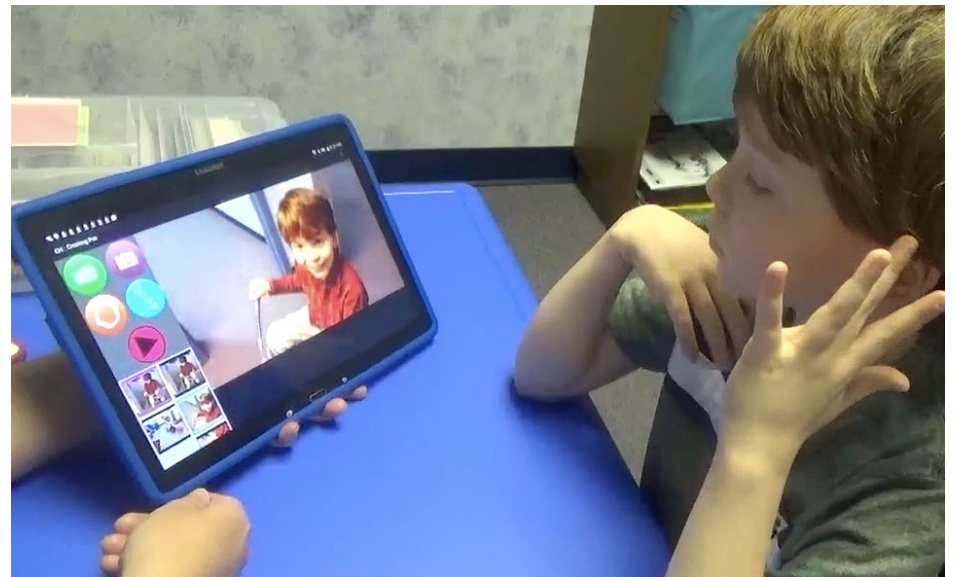
Provide AAC intervention as soon as possible

- Provide AAC intervention as early as possible
 - AAC should not be considered a “last resort”
 - Prevent children with autism from falling further and further behind their peers
- But it is never too late to provide AAC intervention
 - Many autistic adolescents and adults never had access to AAC



Leverage AAC to build communicative competence

- Too often AAC interventions focus solely on requesting ^{11, 16}
- Focus on building independent communication to
 - Express needs and wants
 - **Interact socially** ^{3, 9, 36}
 - **Share information and experiences** ^{6, 24}



Personalize AAC technologies

- Most AAC technologies developed by neurotypical adults
 - Do not reflect the ways children & adults with autism think about the world
- AAC technologies should
 - Be driven by the needs & skills of individuals with complex communication needs
 - Reflect what we know about motor, vision, hearing, cognition, & language development
 - Be appealing, easy to learn & use, powerful²³

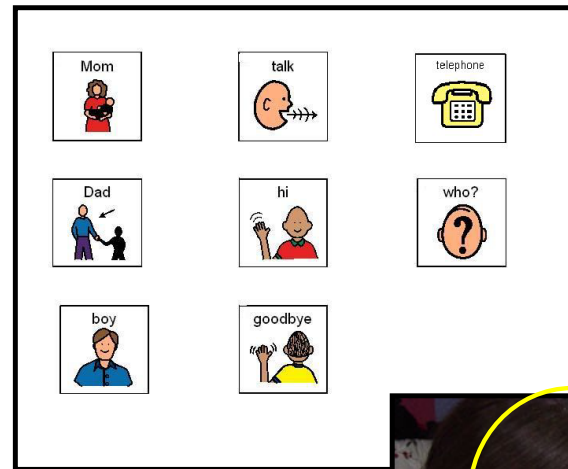


Personalize AAC technologies

- Too often individuals are forced to use AAC systems that are not a good fit²¹
 - One size does not fit all
- Should be personalized to meet the individual's needs, skills, & preferences⁴
 - Vocabulary
 - Representation
 - Organization and layout
- Even relatively small changes to AAC display variables impact accuracy, efficiency, & communicative use significantly²⁵
- **Which AAC technologies work best for whom under which conditions?**

Visual scene display AAC technologies

- Many AAC systems use grid displays
 - Represent language with symbols
 - Taken out of context in which language is learned³⁸
- Visual scene displays (VSDs) & video VSDs
 - Photos or videos of meaningful events within person's life
 - Embed language concepts as “hotspots” within the VSD & video VSD⁴



VSDs and video VSDs for beginning communicators

- Offer significant advantages
 - Processed visually very rapidly ^{32, 41}
 - Drive visual attention to key language concepts in the event ⁴⁰
 - People, actions, shared activity
 - Allow just-in-time programming of vocabulary as needed ^{15, 17}
 - Support increased communication & vocabulary acquisition and expression ^{10,14}



Use VSDs & video VSDs to support **social interaction**

- VSDs & video VSDs support increased communication & social interaction ²⁴
 - Shared book activities between young children with autism & peers ^{36, 37}
 - Shared preferred videos with young children with autism & adults in preschool ⁹
 - Play between school-aged children with autism & peers ^{20, 22}



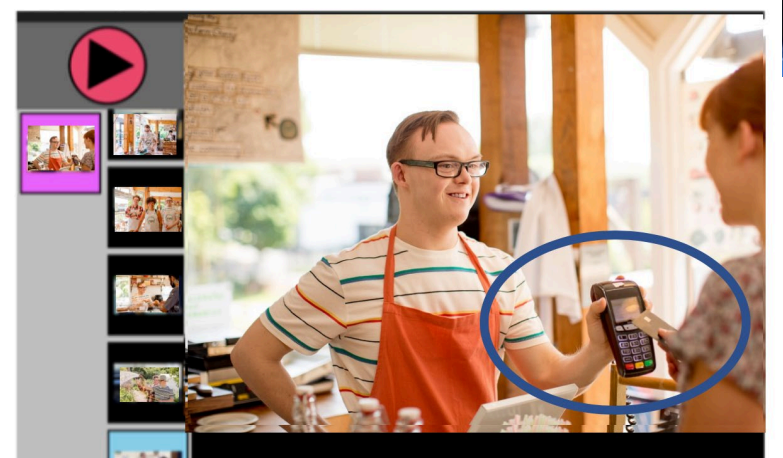
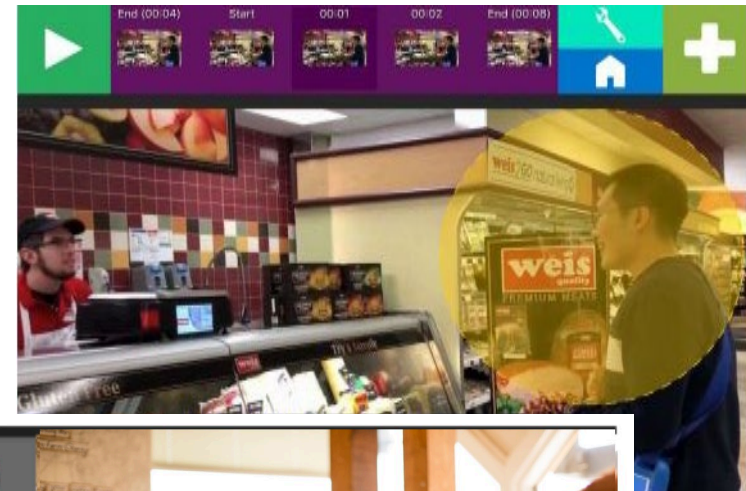
Use VSDs & video VSDs to support peer interactions

- Adolescents with autism & their peers in high school
 - Video VSDs with preferred videos
 - Brief mobile training for dyad
 - Pause video, add hotspots & record vocabulary
- Results
 - Significant increases in social interaction
 - High levels of consumer satisfaction³



Use video VSD technology to increase participation

- 90% of adults with limited speech do not have access to effective AAC to support participation
- AAC video VSD technology provides
 - Video models of steps in task
 - AAC supports for communication
 - Embedded into videos at key junctures
- Substantial increases in successful independent participation in community & vocational activities^{1,2, 30}



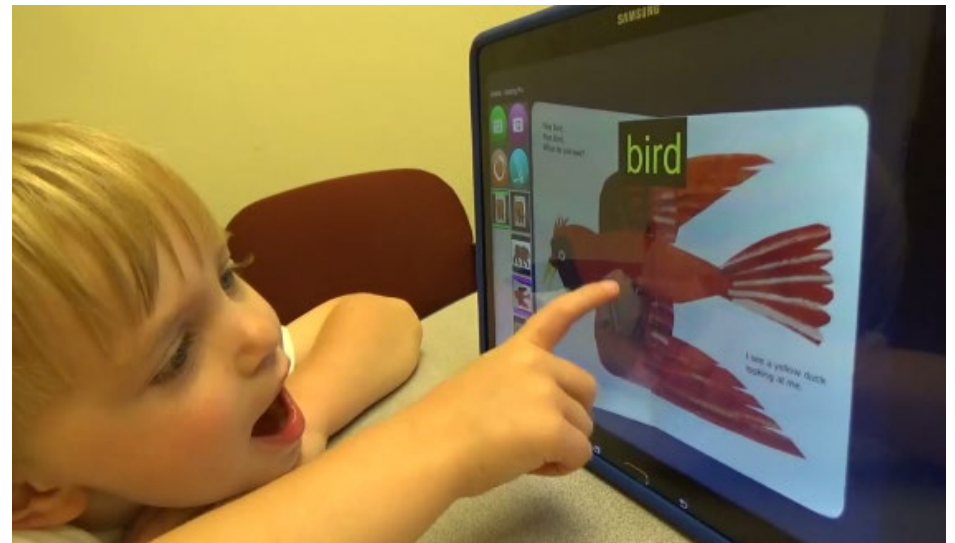
AAC technologies to support literacy learning

- Literacy skills are essential to participation in society
- More than 90% of individuals with complex communication needs enter adulthood without literacy skills
- Current AAC technologies do not support the transition from picture symbols to literacy



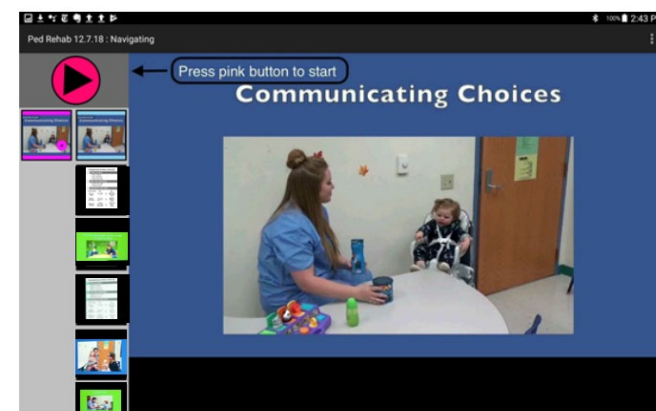
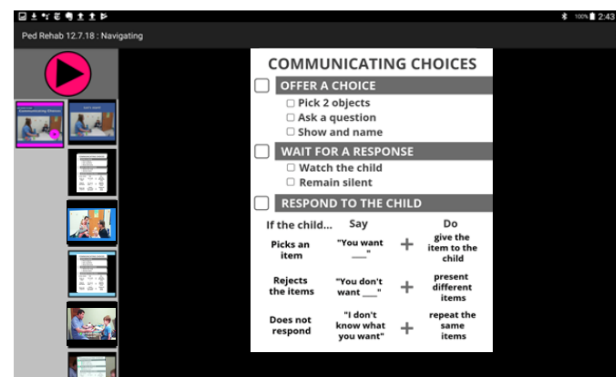
Use AAC technologies to support literacy learning

- **AAC transition to literacy (T2L) technologies**
 - Select a picture symbol from an AAC grid or VSD
 - Written word appears dynamically
 - Drives visual attention to text
 - Word is spoken out
 - Supports phonological processing
- 89% of participants increased literacy skills with AAC apps with T2L feature ^{5, 7, 8, 28}



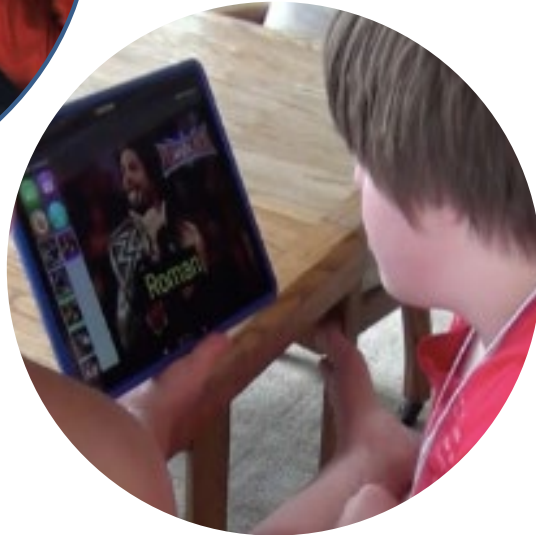
Provide training for communication partners to reduce societal barriers

- Communication partners may not be trained in AAC
 - Pre-empt opportunities for communication & participation
- Need to support family & communication partners^{19, 27}
 - User-friendly app to create mobile trainings that can be deployed “just in time” to train partners
 - Step by step instructions/ Checklist
 - Video demonstrations of each step

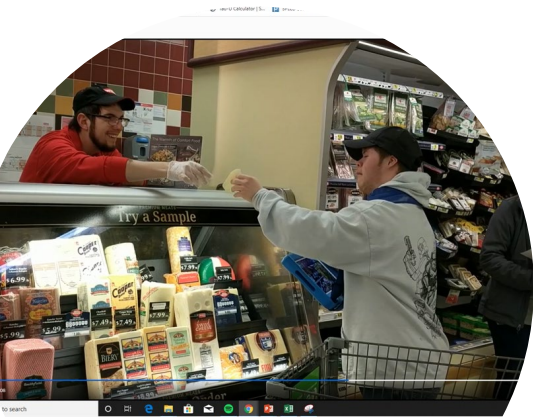




The success of AAC technologies and intervention is best evaluated



by the extent to which they **enhance communication and participation** in valued activities and experiences of everyday life.



For more information...

- For more information, please visit the AAC Learning Center at
 - <https://aac-learning-center.psu.edu/>
- Please also visit our websites at
 - <https://rerc-aac.org>
 - <https://aackids.psu.edu>
 - <https://aacliteracy.psu.edu>
 - <https://aac.psu.edu>



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