

“Just in time” Technology and Visual Scene Displays: Adolescents with Severe Disabilities

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Maximizing communication for children with complex communication needs

- AAC technologies utilizing visual scene displays (VSDs) can significantly enhance the communication of young children with complex communication needs.
- VSDs
 - capture the daily experiences of young children with CCN
 - embed language concepts in the context of these familiar daily activities

The Problem

- Unfortunately, there are two major limitations to current AAC technologies and apps:
 - It is time consuming to program new VSDs and vocabulary
 - As a result, partners do not add vocabulary frequently.
 - It is not possible for partners to dynamically capture new experiences / vocabulary and add them to AAC technologies on the fly during interactions.
 - As a result, it is difficult for partners to respond to children's interests.
 - It is difficult to capitalize on “teachable moments”.

Potential Solution

- One potential solution to this problem is the implementation of AAC technologies that support “just in time” (JIT) programming.
- JIT programming
 - Allows the quick & easy import of photos as VSDs
 - Allows the quick & easy programming of vocabulary as hotspots within the VSDs
 - Allows partners to respond to their children's interests by adding new communicative contexts and vocabulary “on the fly” during daily interactions.

Adolescents

- A limited research base also exists with implementing AAC interventions with adolescents who have complex communication needs.

Research Questions

- What is the impact of appropriately designed aided AAC intervention using JIT technology on the frequency of turns produced by adolescents with severe developmental disabilities during shared context activities?
- What is the impact of appropriately designed aided AAC intervention using JIT technology on the number of different semantic concepts produced by adolescents with developmental disabilities during shared context activities?

Participants

- 9 adolescents participated
 - Aged 8-20 years
- Diagnoses:
 - Autism Spectrum Disorder (ASD)
 - Cerebral Palsy
 - Seizure Disorder
- Had complex communication needs
 - Speech inadequate to meet their communication needs

AAC technology with JIT programming

- Innovative JIT software called PlayTalk developed by InvoTek, Inc.
 - Allowed quick & easy import of photos as VSDs
 - Using cell phone with Bluetooth connection
- Allowed quick & easy addition of hotspots and programming of vocabulary
 - Drawing of hotspots with finger or stylus
 - Recording of digitized speech
- Provided drawing function to add text, numbers, or pictures to VSDs
- Provided a simple menu easily understood by the children
 - Options always visible; represented as thumbnails of VSDs

Procedures

- Single subject multiple baseline design across participants
- The contexts for social interaction included:
 - Music
 - VSDs for verses represented by simple actions
 - Books
 - Made from images with short captions
 - e.g., silly animals, baby faces, sports teams
 - Leisure activities
 - e.g., bean bag basketball, iPad activities, table bowling, musical instruments

Procedures

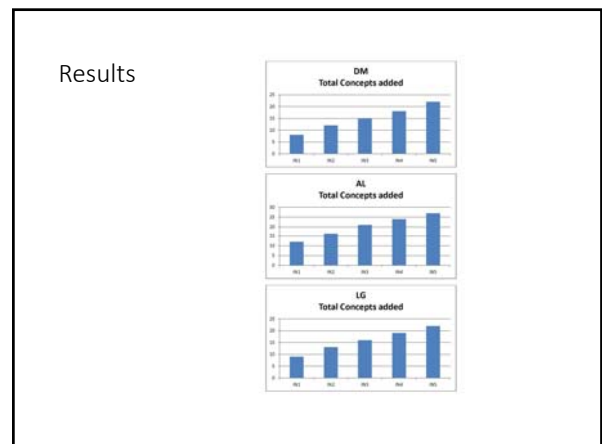
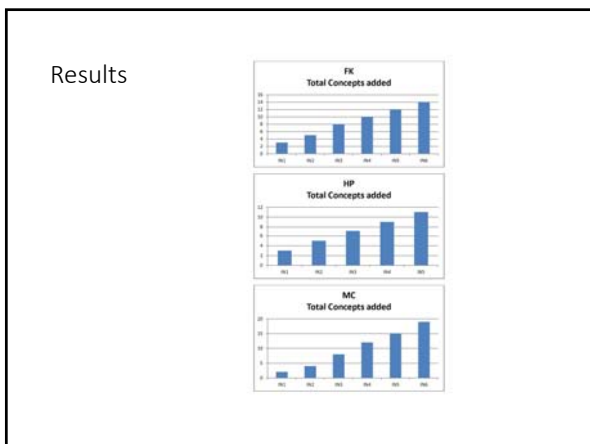
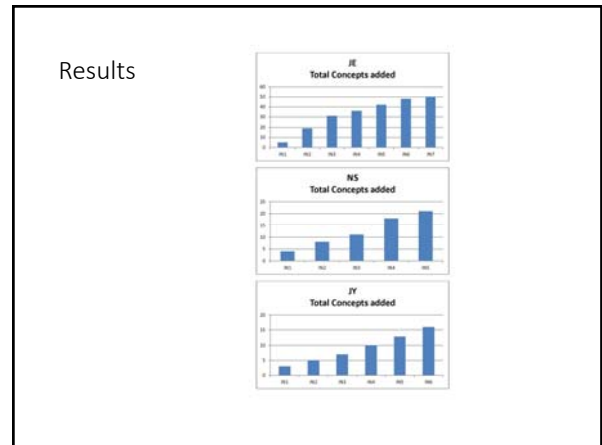
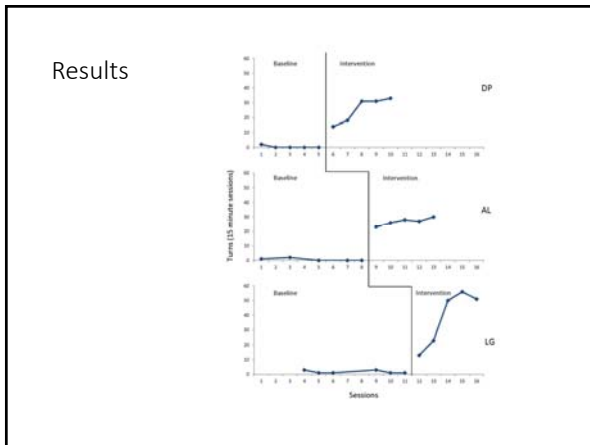
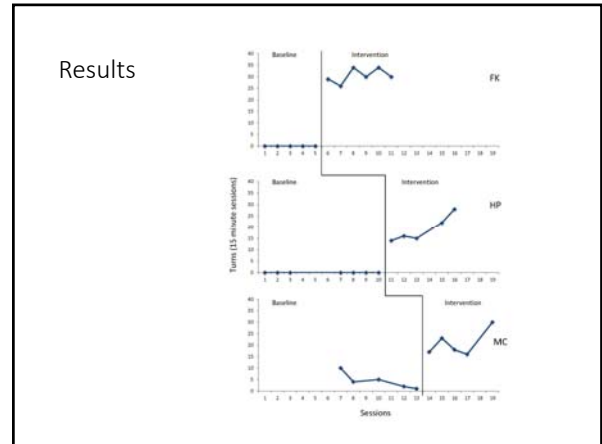
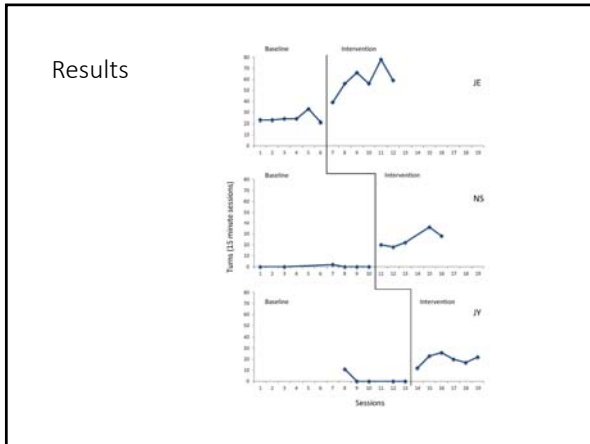
- Independent variable
 - JIT software on a Windows tablet computer
- Dependent variable
 - number of communication turns taken by the participants
 - number of different semantic concepts produced by the participants

Baseline

- The participants were encouraged to interact with the researcher using currently available communicative means (speech, vocalizations, signs, gestures).

Intervention

- Introduction of the aided AAC system (using JIT software)



Discussion

- All nine participants demonstrated significant increases in the number of communication turns taken.
- They also showed significant increases in the number of concepts they were able to express once provided access to these words and ideas during intervention.

Conclusion

- This study supports the use of JIT technology that allows partners to dynamically respond to ongoing activities and interests, and to take advantages of opportunities that present themselves, while reducing programming demands on clinicians and families.
- The current intervention has demonstrated the possibilities for adolescents with multiple severe disabilities to develop social communicative skills.
- This research also showed implementation of JIT technology using age-appropriate activities that are of interest to adolescents who have severe disabilities.

Conclusion

- These projects represent an exciting transition for the field to AAC systems that are truly dynamic
 - Capture interaction on the fly as it occurs
 - Support dynamic learning /language growth
 - Allow partners to respond to children's interests
 - Reduce programming demands on clinicians & families
 - Incredibly easy and time saving
- With access to JIT technologies, parents and clinicians will be better able to support the language and communication development of beginning communicators with CCN, at any age

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