

Background

Programming of many AAC technologies/ apps is so time consuming that it is difficult for parents and professionals to find time to add vocabulary for their children. Furthermore, programming is often so complicated that it has to be completed offline away from daily interactions. As a result, children who use AAC apps often do not have the vocabulary that they require within their daily interactions. Responsivity to children's interests plays a critical role in fostering language and communication development; yet current AAC apps do not allow partners to easily respond to their children's interests by adding new vocabulary. Just-in-time (JIT) programming ensures that parents and professionals can respond to their children's interests immediately as the need arises; it allows the quick and easy import of photos as VSDs as well as programming of vocabulary as hotspots during daily interactions. It provides a mechanism for young children to be more actively involved in the selection of vocabulary and the design of their AAC systems. JIT programming has the potential to reduce substantially the demands on parents and professionals and to support more effectively the language and communication development of young children

Research Methods and Results

This session will describe the concept and theoretical rationale for JIT programming and will report on the results of a series of three research studies designed to first establish the viability of JIT programming and then to investigate its benefits with children with CCN. The first study utilized a within subjects group design to investigate the time required to program new VSDs and vocabulary offline using three different AAC apps (that varied in the number of programming steps) in order to investigate the viability of JIT programming. Specifically, 10 naïve adults were provided with written, illustrated instructions for programming each app and were asked to complete three programming tasks. Results demonstrated that all of the professionals were able to successfully program all of the apps without prior training; they were fastest programming with EasyVSD, the app with the fewest programming steps, and they were slowest with AutisMate, the app with the most programming steps. Time to program decreased for all of the participants with practice (a mean of 56s to program a VSD with 2 hotspots for EasyVSD, 66s for GoTalk Now, and 72s for AutisMate). These times suggested that JIT programming should be viable within communicative interactions with children.

The second study utilized a within subjects group design to investigate the viability of JIT programming using two different AAC apps (GoTalk Now, EasyVSD) by professionals in interactions with young children. The professionals all worked with children with CCN, but they had no prior experience with the apps or JIT programming. In this study, they interacted with children with typical development to establish the viability of JIT programming prior to involving children with CCN. The results indicated that 100% of the professionals were able to successfully implement JIT programming during the interactions with the children with both apps, but they created more VSDs and added twice as many vocabulary concepts with the app with fewer programming steps (i.e., EasyVSD) than the app with more programming steps (i.e., GoTalk Now).

The children demonstrated high levels of engagement with both apps, but they were more engaged and participated in JIT programming more frequently with the app with fewer steps than the one with more steps. These results demonstrated that JIT programming is viable during interactions with children, and may provide a mechanism for young children to be more actively engaged in vocabulary selection and the design of AAC systems.

Study 3 investigated the effects of an app that supported JIT programming (EasyVSD) on the communication and vocabulary use of young children with CCN. This study utilized a single subject multiple baseline design across 5 children, ages 15-30 months, who had CCN and developmental disabilities. Data were collected weekly during free play sessions with the children and their parents in their homes across three phases: baseline, intervention, and maintenance. During baseline, the children used their typical modes of communication. During intervention, the AAC app with JIT programming was introduced. Once intervention was complete, maintenance data were collected to investigate long term effects. Each 15-min session at baseline, intervention, or maintenance was videotaped and coded with respect to the children's communicative turns and the range of concepts communicated. Data were also collected on the number of vocabulary concepts available to the children with the AAC app each week. Results showed that the children took significantly more communicative turns and expressed a greater number of concepts when they had access to the AAC app that supported JIT programming compared to baseline. Furthermore, the children continued to demonstrate gains in their communication using the JIT app with their families during maintenance. The app allowed the quick addition of vocabulary immediately as the need and interest arose. It ensured that the children had access to vocabulary that was more responsive to their needs and interests, allowing partners to capitalize on teachable moments throughout the day. The children showed significant interest in JIT programming; they were actively engaged and assisted in the adding VSDs and hotspots. Results of the study will be presented with video examples to illustrate the effects of JIT programming. Directions for future research will be considered.

Significance

Overall the results of these studies support a significant paradigm shift in the field from pre-programming vocabulary offline to programming just-in-time during interactions with individuals with CCN. JIT programming ensures that children have access to the vocabulary they require in their daily interactions and it allows partners to respond to the interests of young children with CCN thus maximizing language development.

Declaration of Interest: Janice Light, Jessica Gosnell Caron, Jessica Currall, Clark Knudtson, Merissa Eckman, Christine Holyfield, Beth Breakstone and Kathryn Drager have no financial or other interest in objects or entities mentioned in the paper.

This research was supported by a grant from the U.S. National Institutes of Health 2R44HD059231-02 SBIR Phase 2.



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Program Planner/Instructional Personnel’s Name: Janice Light

Course Title: Just-in-time programming of AAC apps for children with complex communication needs

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Date 10/29/2015