Beginning communicators' participation in conversation is limited; they are largely respondents and contribute mostly with the function of the expression of wants and needs (Light, Parsons, & Drager, 2002). Although intrinsic factors are at play (e.g., working memory), extrinsic factors such as AAC device availability and device vocabulary may have a larger impact on the lack of participation experienced by individuals who are beginning communicators (Beukelman, McGinnis, & Marrow, 1991; Beukelman & Mirenda, 1998; Light, Parsons, & Drager, 2002). Some AAC research has focused on informing and improving system design for individuals who use AAC, including beginning communicators (e.g., Drager, Light, Curran-Speltz, Fallon, & Jeffries, 2003). Visual Scene Displays (VSDs) – in which concepts are represented in a contextual scene such as a photograph in contrast to a grid display with isolated symbols – are one layout option that may benefit beginning communicators because of their lowered demands on motor, linguistic, cognitive, and perceptual processing (Light & Drager, 2007). "Just-in-time" (JIT) programming features allow facilitators or individuals who use AAC to program vocabulary during teachable moments or within conversations. JIT programming is contrasted by the traditional programming paradigm in which facilitators pre-program messages for individuals who use AAC to use during later conversations/within later contexts. JIT features – such as lessened steps and larger buttons that make programming vocabulary less cumbersome – are another potential option for enhancing the appropriateness of AAC devices for individuals who are beginning communicators. The goal of the current presentation is to orient viewers to the importance of developmentally appropriate AAC by presenting on two related studies – one that explored typically developing toddlers' performance with JIT and one that explored the effects of JIT technology on both communication and participation in programming for adolescents who are beginning communicators.

The first study utilized a within and between group design to explore the extent to which two groups of typically developing toddlers – 10-16 month olds and 18-24 month olds – participate effectively in programming on a communication tablet with a VSD display and JIT programming features. Descriptive data will be presented for each group on their accuracy with completing each of the steps involved in programming: selecting the photo icon, taking a picture, selecting the hotspot icon, drawing a hotspot, selecting the record icon, recording a message, selecting the draw icon, and drawing. An RMANOVA was conducted to compare overall performance between the two groups of toddlers. The second study utilized a single subject, across participants methodology (Kazdin, 2011). Five adolescents participated in the second study. The independent variable was the provision of a communication tablet with VSDs and JIT technology and programming. The primary dependent variable was the number of communication turns taken by the participants within a fifteen minute session. A collateral variable considered was the adolescents' participation in programming. Information relative to engagement was also considered. The results were graphed and visually analyzed (Kazdin, 2011). Percent Non-overlapping Data (PND) were calculated for each of the five participants (Scruggs, Mastropieri, & Casto, 1987).

For the first study – the study conducted with typically developing toddlers – 100% of the toddlers participated accurately in some aspect(s) of programming. There were some between-group differences as the older toddlers (18-24 months) demonstrated significantly higher success with programming turns than the younger toddlers (10-16 months). However, both groups participated with surprisingly high rates of success. More interestingly than between group differences were the differences between the different operational steps for each of the toddlers. Both groups demonstrated similar patterns in terms of the steps in which they were

highly successful and the steps with which they had less success. Steps allowing for the highest levels of success for both groups include taking a picture and drawing on the hotspot. For the second study – the single-subject study with adolescents who were beginning communicators – 100% of the adolescents had 100% PND from the baseline condition with the AAC systems currently available to them to the intervention condition with the provision of JIT programming. Additionally, three of the five adolescents participated independently and successfully in JIT programming. Echoing the findings from the toddler study, taking a picture was again the step of JIT programming with which the beginning communicators demonstrated the most participation and success.

Taken together, results from the two studies suggest that JIT technology is one step toward lowering the developmental demands of AAC devices for individuals who are beginning communicators. Based on the toddlers' high level of success with programming, JIT features place limited levels of demands on the AAC user in programming. This finding was echoed with the participation in JIT programming that occurred by the adolescents in the second study. Additionally, provision of JIT technology and programming can increase communication turns for adolescents who are beginning communicators. An increase in communication turns has important implications for participation in meaningful contexts such as the classroom, which in turn has important implications for learning (Cohen, 2004). An increase in participation in programming has important implications relative to supporting self-determination in beginning communicators and providing beginning communicators with control over the vocabulary available to them – a choice that is unfortunately rarely available.

Declaration of Interest: The authors disclose they have no financial or other interest in objects or entities mentioned in this paper.

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