

Moore, J.R., Harris, O.H., Payne, K.T., Wright-Harp, W., & Woods, D. (2007, September). *Syntactically Salient Storybook Intervention Model and Language Development of Children who use AAC*. Paper presented at the 2007 Clinical AAC Research Conference, Lexington, KY.

---

## **Syntactically Salient Storybook Intervention Model and Language Development of Children who use AAC**

Jacquelyn R. Moore<sup>1</sup>, Ovetta Harrison Harris<sup>2</sup>, Kay T. Payne<sup>2</sup>,  
Wilhelmina Wright-Harp<sup>2</sup>, David Woods<sup>2</sup>  
<sup>1</sup>Montgomery County Public Schools; <sup>2</sup>Howard University;

### **Abstract**

The aim of the study was to determine the effectiveness of the Syntactically Salient Storybook Intervention Model (SS-SIM) to advance two syntactical productions of four participants, 6;0 to 11;5 years, who evidenced deficits in language skills when using augmentative and alternative communication (AAC). SS-SIM used Syntactically Salient Storybooks (SS-Storybooks) designed by the investigator to emphasize targeted syntactic structures at the subjects' instructional level identified as the Zone of Proximal Development (ZPD). These storybooks were used in interactive reading with scaffolding strategies that included print referencing, cloze technique, and aided language stimulation.

This study used the multiple-baseline with multiple probes, single-subject research design. Periodic language samples were collected to monitor changes in syntactic productions. Brown's Linguistic Development Matrix (1973) was used to analyze the language samples. The results revealed that SS-SIM was an effective intervention for the development of syntactic skills for individuals who used AAC, with similar profiles.

### **Introduction/Background Information**

Research has shown that many users of Augmentative and Alternative Communication (AAC) systems evidence significant difficulties specifically in the area of syntactical structures (1992; Iacono, 1992; Sutton, Soto, & Blockberger, 2002). "Incomplete syntax, improper word order, omission of functor words (e.g., articles and prepositions), and omission of morphological markers (e.g., plural markers, verb tenses) can cloud a speaker's message and contribute to communication breakdowns" (Lund & Light, 2003, p. 1110). The development of language skills is critical to the AAC user as it serves as the foundation for all communication: manual, gestural, written, and spoken (natural or augmented speech). This study has explored the effectiveness of a technique to advance syntactic development of children who have complex communication needs and use AAC to communicate.

## Statement of Purpose

The lack of knowledge about the development of augmented language sets the backdrop for this investigation. The purpose of this investigator was to develop an intervention protocol that could be used to enhance the language acquisition process of limited speaking children who use AAC devices to communicate. Research on the language development of children with complex communication needs has been impacted by multiple variables which include: (a) extremely limited verbal output, making it difficult to ascertain language levels, (b) restrictions of the AAC system, and (c) the asymmetry that exists between the channels of language input and language output (Smith & Grove, 1986 as cited in Sturm & Clendon, 2004 ).

## Method

To examine the functional relationship between the independent and dependent variables, this study was implemented using a single-subject multiple baseline with multiple probe design across two behaviors and four participants. The use of the single-subject research design allowed for the establishment of experimental control and for the evaluation of the efficacy of the intervention protocol.

The use of the multiple probe design was deemed appropriate for this study as it allowed for periodic versus continuous probes of the behavioral responses. The probes (repeated measurements) allowed for tracking of participants' performance and behavioral changes throughout the intervention.

## Participant Demographics

<b>Participant Age Gender</b>	<b>Primary Disability</b>	<b>Communication Mode/years experience</b>	<b>Augmented Output<sup>1</sup></b>
Allegro 10;6 Male	Athetoid quadriplegia Cerebral Palsy	DynaVox with Picture WordPower 5 years usage	Eye gaze; 1-3 word utterances– augmented speech
Arial 7;5 Female	Spastic Cerebral Palsy	DynaVox with Picture WordPower 3 years usage	Gestures, 1-3 word utterances – augmented speech
Chaucer 8;3 Male	Developmental delay and verbal apraxia	DynaMyte with Picture WordPower	A few signs; 2-5 word utterances; natural

		4 years usage	(unintelligible) & augmented
French Vogue 11;3 Female	Cerebral Palsy	DynaVox with Picture WordPower 6 years usage	Gesture; 1-3 word utterances – augmented; 15-20 word-natural speech
Verdana 10;0 Female	Diplegia cerebral palsy	DynaMyte w/ Picture WordPower 4 years usage	A few signs, 2-4 word utterances – augmented speech; 1-3 word utterances – natural speech

This design allowed the investigator to answer questions about the nature and rate of student progress, the effectiveness of the instructional method, and whether student progress could be attributed to identifiable instructional strategies. The independent variable for the investigation was the Syntactically Salient-Storybooks (SS-Storybooks) developed for this investigation and applied in an interactive reading intervention model. The dependent variable was the spontaneous production of syntactic structures when participants used AAC devices during conversation, picture description, and question-formulation tasks.

The procedures were used consistently across all phases of this study. The participants had access to their AAC device during all reciprocal storybook reading interactions and probes. The participant responses and nonlinguistic behaviors during the SS-SIM protocol were recorded in field notes and later transcribed onto data sheets. The investigator naturally reinforced the participants' responses with expressions such as "Good job!" "That's right!" and "Great!"

The participants received two to three sessions a week of 30-45 minutes in length. One SS-Storybook was read over three sessions. This therapy schedule corresponded to the number of therapeutic sessions many children at the primary level with severe speech and language and AAC needs receive from the school based speech-language pathologist. Once the participant completed three contacts with the SS-Storybook, an intervention probe was conducted.

## Results

One research question was the main focus of this investigation. The experimental question addressed the degree to which the use of the Syntactically Salient-Storybook Intervention Model improved the spontaneous production of two syntactic structures. For each of the four participants, the target structures were selected based on the determination of the level

of syntactic development after analysis of their spontaneous language samples, while using a speech-generating device. The research question for this investigation was:

Do children who use AAC to communicate increase their spontaneous production of advanced syntactical structures as a result of systematic intervention with the Syntactically Salient-Storybook Intervention Model?

The investigation focused on participants' production of two target syntactic structures (TSS) identified as absent from the spontaneous language sample elicited prior to the intervention. The SS-SIM had a positive effect on the acquisition of all target structures: Subject + Verb + Object, Be + *ing*, and Wh-Question Formulation for all participants. Three participants received 25 therapeutic intervention sessions, while one participant had 20 sessions. Figures 1-3 depict the results of language sample probes from baseline through the SS-SIM Intervention Phase.

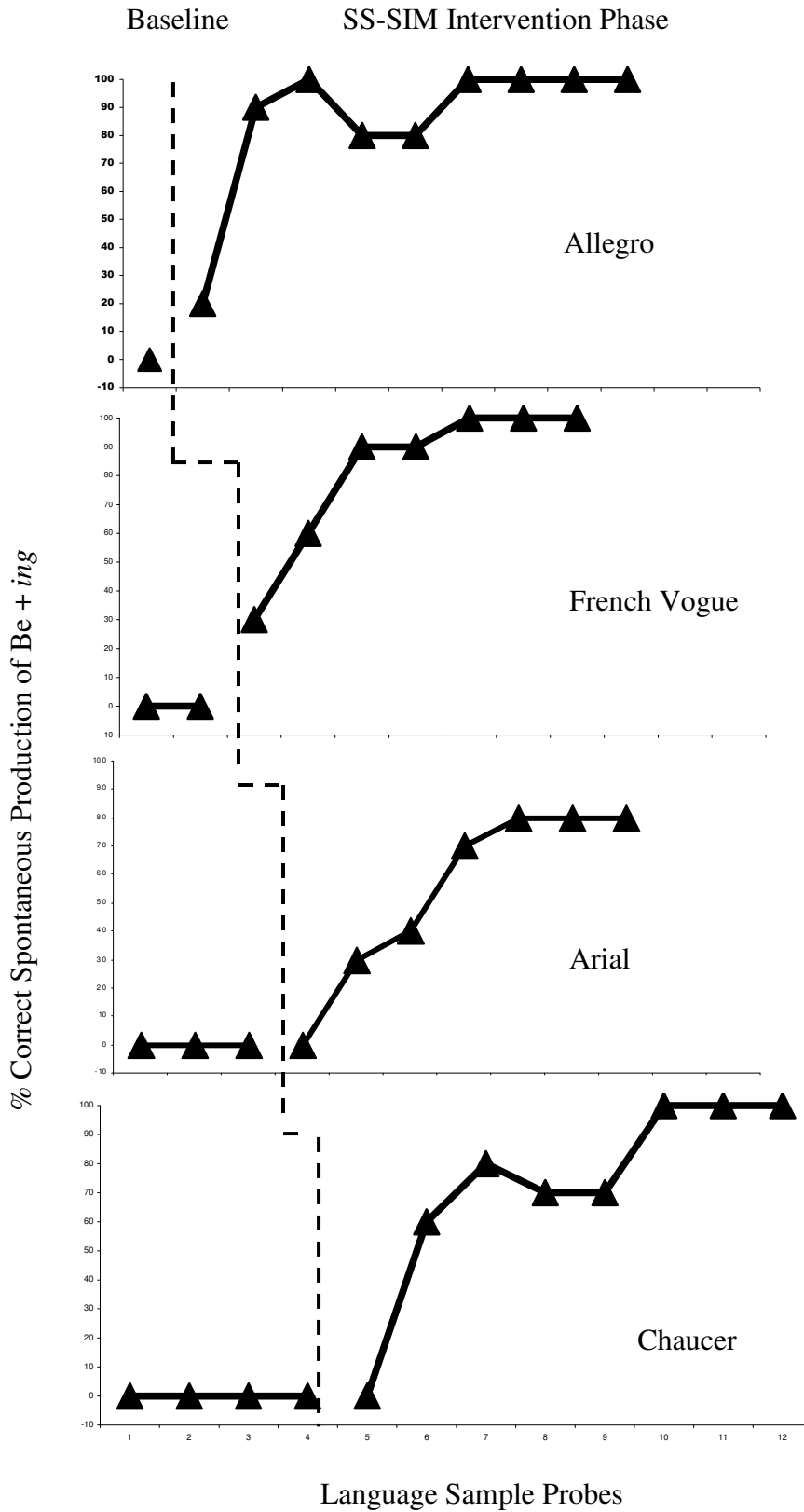


Figure 1. Acquisition of Be + *ing* across all participants.

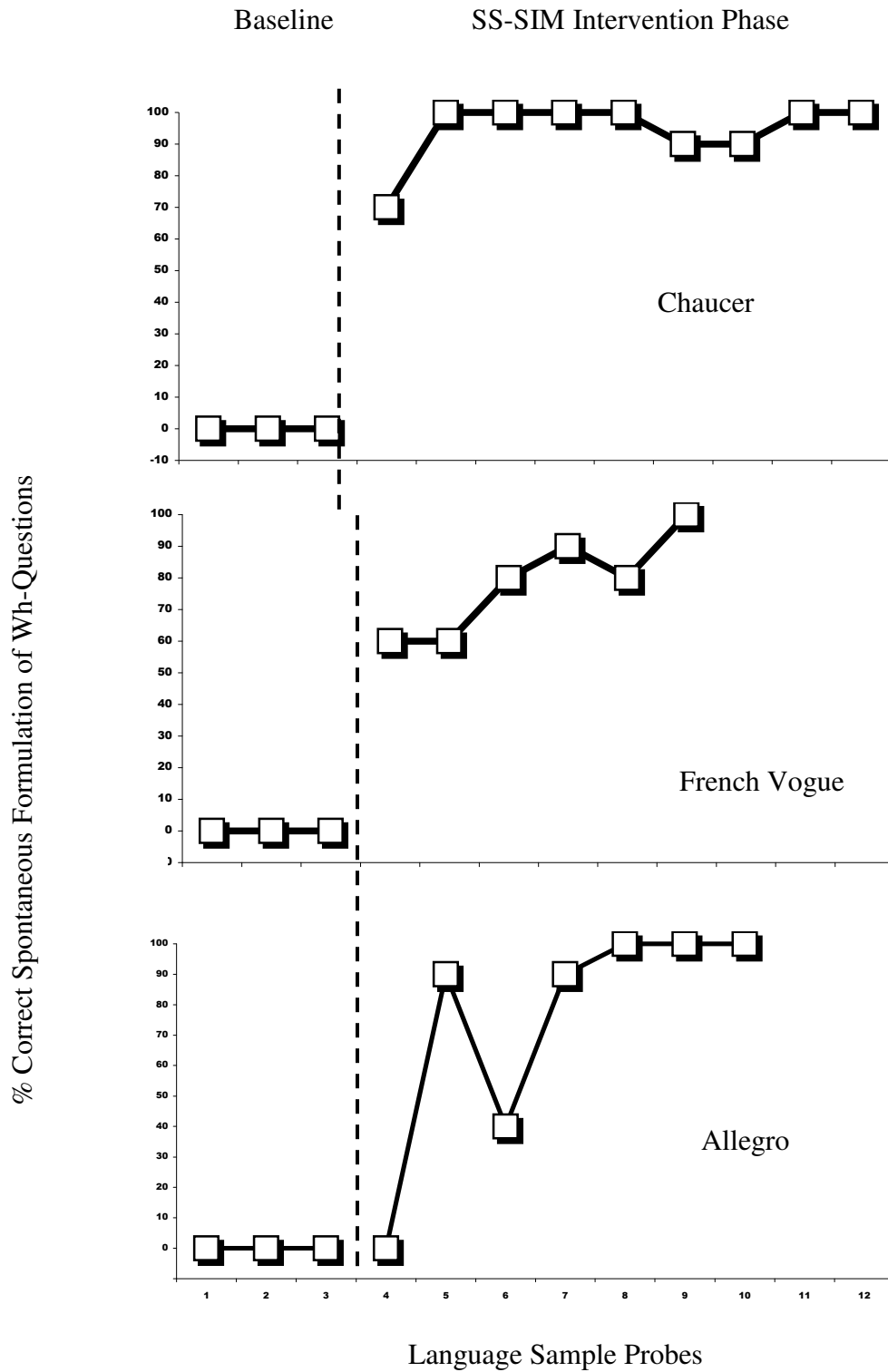


Figure 2. Acquisition of Wh-question formulation across three participants.

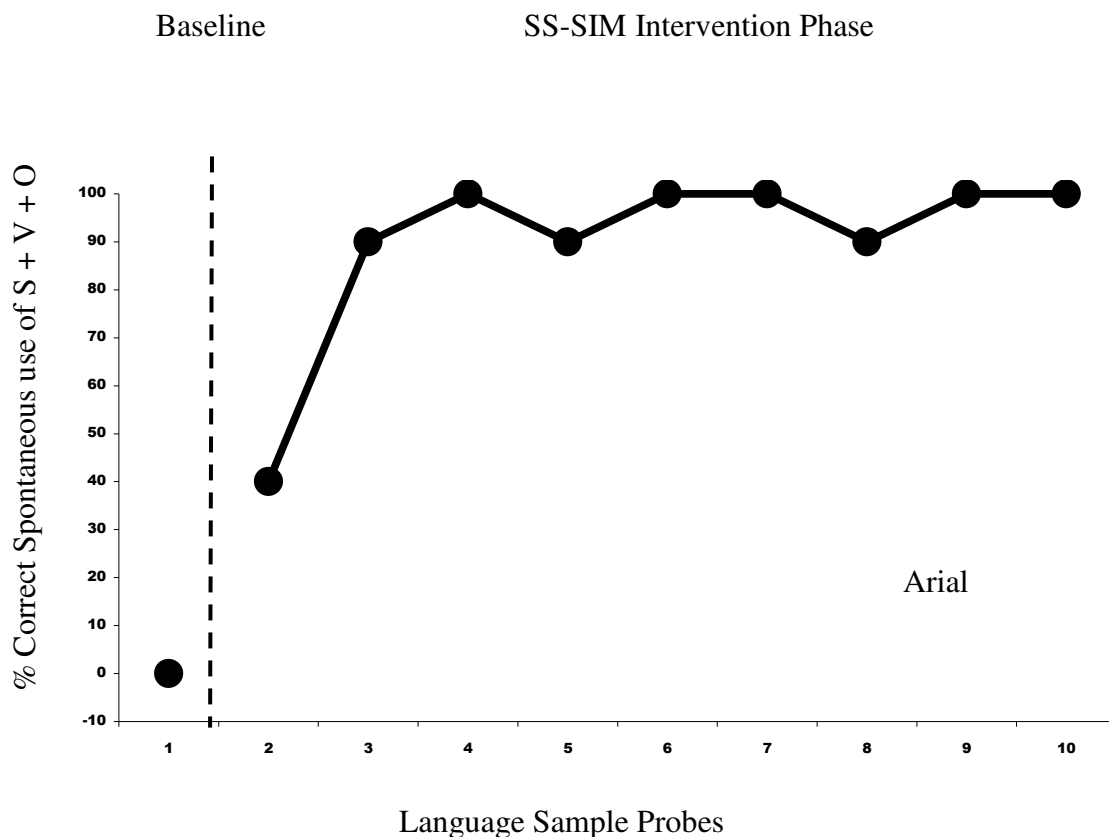


Figure 3. Acquisition of subject + verb + object for Arial.

### Conclusion

This current investigation resulted in notable changes in the spontaneous augmented productions of the four participants, ranging from an 80-100 percent increase in syntactic structural usage. In addition, noteworthy information was gathered from the results of the direct replication component of this investigation. It was demonstrated that a student who was simultaneously receiving didactic speech therapy only changed in her spontaneous language production of the syntactic structure targeted in SS-SIM (not the school therapy structure). The participants also evidenced incidental learning subsequent to the exposure to SS-SIM that included increased use of pronouns, verbs, and self-monitoring/self-correction skills. All of these results suggest the effectiveness of the intervention strategies utilized in SS-SIM.

### Clinical Implications

A clinical implication as a result of this intervention is the use of alternative assessment protocols to accurately determine the child's spontaneous skills so that the therapeutic intervention would be within the child's ZPD. This investigator suggests that the use of language samples and interviews of individuals in the home, school, and community setting as an

alternative to the adaptation of standardized tests to gain a picture of functional communication strategies and language behaviors of speakers who use AAC.

The context of SS-SIM also supported the importance of not teaching a concept in isolation. Research conducted by Whitehurst et al., (1988) suggested that “picture book story time offered a rich opportunity for young children to learn language” (p. 552). The use of storybooks in the SS-SIM protocol capitalized on content, form, and use as it related to language development and competency. The storyline allowed the participants to focus on their “knowledge of objects, relations between and among objects, and relations between and among events” (Lahey, 1988, p. 23).

The concerted teaching of verbs rather than the concentration on “I Phrases” was also clinically implicated. The context of the SS-Storybooks contained a wide variety of verbs, all of which were easily accessible in the vocabulary set of the Dyna, but were rarely spontaneously utilized by the participants in conversations or academic tasks prior to this investigation. The repeated exposure to a wide array of verbs through creating the sentences as well as the interactive reading process of SS-SIM, served to not only support the complexity of morphosyntactic structure, but also supported semantic growth.

Upon observation in environments beyond speech therapy, it was noted the general communication context in both school and home had not adjusted to allow for the use of the new structures. The communication partners continued to co-construct the messages or required messages structured at an expected higher language level rather than at the participant’s actual language level. A subsequent implication is the development of training modules that would support the generalization of newly acquired language structures by training the communication partners to appreciate the linguistic progress children make in therapy. This would expand the communication partner’s understanding and acceptance of the augmented speaker’s level of language competency and performance.

## Bibliography

Brown, R. (1973). *A first language: The early stages*. Cambridge, Mass: Harvard University Press.

Gerber, S., & Kraat, A. (1992). Use of a developmental model of language acquisition: Applications to children using AAC systems. *AAC Augmentative and Alternative Communication*, 8(1), 19-32.

Iacono, T. A. (1992). Individual language learning styles and augmentative and alternative communication. *AAC Augmentative and Alternative Communication*, 8(1), 33-40.

Lahey, M. (1988). *Language disorders and language development*. New York: MacMillan.

Lund, S. K., & Light, J. (2003). The effectiveness of grammar instruction for individuals who use augmentative and alternative communication systems: A preliminary study. *Journal of Speech, Language, and Hearing Research*, 46, 1110-11123.

Smith, M. M., & Grove, N. (1986, August). *Input/output asymmetries - Implications for language development in AAC*. Paper presented at the Biennial conference of the International Society for Augmentative and Alternative Communication, Vancouver, Canada.

Sutton, A., Soto, G., & Blockberger, S. (2002). Grammatical issues in graphic symbol communication. *AAC Augmentative and Alternative Communication*, 18(3), 192-204.

Whitehurst, G. J., Falco, F. L., Lonigan, C. J., Fischel, J. E., DeBaryshe, B. D., Valdez-Menchaca, M. C., et al. (1988). Accelerating language development through picture book reading. *Developmental Psychology*, 24(4), 552-559.