Writing Development and Instruction Across Preschool and Elementary School
Organizer: David Coker, University of Delaware, U.S. dcoker@udel.edu

This symposium brings together researchers who have been conducting empirical investigations of writing development and intervention with students in preschool through elementary school. In these five studies, the authors examine a complex model of early development, the stability of neuropsychological abilities, the impact of linguistic and cognitive factors on early composing, the importance of feedback during early handwriting instruction, and the feasibility of an informational writing intervention. A common strand across these presentations is a theoretically grounded analysis of student writing related to development and instruction.

Paper 1: A direct and indirect effects model of developmental writing (DIEW) II
Author: Young-Suk Grace Kim, Florida State University

The direct and indirect effects model of developmental writing (DIEW) hypothesizes that multiple language and cognitive component skills of writing have direct and indirect effects on writing. This model is an expansion of developmental models of writing such as the simple view of writing as well as the not-so-simple view of writing. The DIEW model was tested using data from children in primary grades in the United States. Results from structural equation modeling supported the DIEW model and showed that discourse-level oral language and transcription skills (spelling and handwriting) completely mediated the relations of higher-order cognitive skills, foundational oral language skills (vocabulary) and foundational cognitive skills (working memory and attention). Total effects incorporating direct and indirect effects of the language and cognitive component skills of writing varied from small to relatively large.

Paper 2: Measurement Invariance of Neuropsychological Functions to Written Language in Elementary School Students in Grades 1 Through 4

This presentation examined the measurement stability of key neurocognitive abilities to the evolution of written language in grades 1 through 4: fine-motor, language, and executive functions. At study entry, the sample included 205 first-grade students from 6.0 to 7.33 years.

Results of structural equation models (SEM) indicated that the neuropsychological model demonstrated stability and good fit at all grades, suggesting that executive function, language, and fine-motor were replicable across the four grades. In the test of the relative contributions of the neurocognitive components to changes in spelling and writing, the model with freed covariances fit the data moderately well. To test whether the correlations change over time, a second multi-group SEM yielded similar fit to the free model, and the contributions of each factor remained relatively stable from first to fourth grades.
Findings suggest the relative stability of underlying neurocognitive abilities in the development of written language. Targeted neurocognitive measures can shed light on the development of written language abilities, and can provide clues for early predictors and cognitive factors that can affect writing development.

**Paper 3: Early Writing Development: The Role of Linguistic and Cognitive Predictors on Writing**

Authors: David Coker, Austin Jennings, Charles MacArthur, Elizabeth Farley-Ripple  
University of Delaware

This presentation examined the not-so-simple view of writing with first-grade students. Specifically, we investigated how measures of transcription (spelling and handwriting), oral language, reading, and executive function were related to students’ extended writing. Another goal is to expand on previous work by using a multi-dimensional measure of written composition. 230 first-grade students from 29 classrooms wrote two extended texts (narrative and description) and four factors that were common across the two genres were identified using confirmatory factor analysis (Quality/Length, Spelling, Syntax, Mechanics). Preliminary analyses using SEM suggest that relationships may vary depending on which factor is predicted, and in some models executive function may have an indirect effect on composition.

**Paper 4: Using Tablet Computers to Teach Preschool Children to Write Letters: Exploring the Impact of Extrinsic and Intrinsic Feedback**

Author: Cynthia S. Puranik, Georgia State University

Despite the increasing popularity of touchscreen devices, the research regarding their effectiveness in education is limited. Therefore, we explored two types of feedback afforded by tablet computers: concurrent, extrinsic feedback (i.e., feedback provided by an iPad as soon as an error was made) and intrinsic feedback (i.e., naturally occurring sensory information resulting from practicing writing with one’s finger). Fifty-four preschool children (ages 41-65 months) were recruited. Research staff taught children to write eight uppercase letters in small groups. In randomly assigned groups, children practiced writing the letters in one of three ways: paper and pencil, iPad and finger, or iPad and stylus. The number of correct letters written on a paper-and-pencil posttest depended on the condition. Those who practiced with a stylus on an iPad wrote a similar number of letters as those who used paper and pencil. This suggests that concurrent, extrinsic feedback did not provide an additional benefit. Interestingly, those who practiced with their finger on an iPad wrote more letters than those who used a stylus on an iPad.
This indicates that an enhanced tactile experience was more beneficial than increasing the similarity between the practice and transfer tasks, indicating the promise of using tablets to teach writing.

**Paper 5: Writing Informational Text: Feasibility and Pilot Testing of an Intervention**

Authors: Michael Hebert, Janet Bohaty, Ron Nelson, and Julia Roehling  
University of Nebraska—Lincoln

Students with reading difficulties struggle with informational text, and a recent meta-analysis indicates text structure instruction improves informational reading comprehension, especially when it includes writing instruction. However, writing informational text may be difficult because of the demands of topic knowledge. The *Structures* intervention is being developed to address this need.

Fourth and fifth graders in a summer program for students with reading difficulties (*n* = 42) participated. Twelve received the *Structures* writing intervention, and thirty received typical instruction. At pretest, all students were given norm-referenced, reading and writing assessments. Dependent measures included researcher-created *Structures Informational Writing* and *Structures Reading Comprehension* assessments. Treatment students were taught to write with information provided in note form, allowing instruction to focus on text structure. Results will be discussed in terms of feasibility and usability. Underpowered effect sizes will be shared to show promise for improving writing and reading skills.