CELLreviews

Center for Early Literacy Learning

2013 ■ Volume 6 ■ Number 3

Influences of Different Types of Writing Activities on the Emergent Writing Abilities of Toddlers and Preschoolers

Carol M. Trivette
Carl J. Dunst
Deborah W. Hamby

Factors associated with variations in toddlers and preschoolers emergent writing and drawing skills were the focus of a research synthesis including 13 studies of 491 children between 24 and 67 months of age. Results showed that the use of magic markers, structured activities, and verbal prompts influenced the children's emergent writing skills and that when the interventions were conducted over multiple sessions, the interventions had value-added effects. The factors that were associated with the children's emergent writing skills differed from those in a research synthesis of infants and younger toddlers which suggested the need for careful attention to the intervention characteristics used to promote writing and drawing for children of different ages. Implications for practice are described.

The extent to which different characteristics of early writing activities influenced toddlers' and preschoolers' prewriting and emergent writing skills was the focus of the analyses described in this research synthesis. Various investigators have examined the use of different strategies for promoting the development of emergent writing and drawing skills in young children (e.g., Aram, 2006; Braswell & Rosengren, 2005). For example, investigators have evaluated the use of various types of writing tools (Readdick, 1994; Yamagata, 2001), parent-child letter writing activities (Burns & Casbergue, 1992), and different child-focused writing and reading activities (Aram, 2006) to promote the development of emergent writing and drawing skills in young children.

The purpose of this research synthesis was to identify the characteristics of emergent writing interventions that were related to variations in the development of drawing and emergent writing skills. The research synthesis was an extension of a *CELLreview* that focused on how different characteristics of different kinds of drawing activities influenced the early drawing abilities of infants and young toddlers (Dunst & Gorman, 2009). A secondary purpose of the research synthesis was to determine if the factors associated with emergent writing were similar or different for infants and young toddlers compared to older toddlers and preschoolers.

Search Strategy

Studies were located using *scribb** OR *draw** OR *print** OR *crayon** OR *pencil** OR *trace** OR *writ** OR *tracing* OR *draw** tool OR *writ** tool OR *draw** *instrument* OR *writ** *instrument* OR *doodle** AND *infant* OR *infancy* OR *toddler* OR *children* OR *preschool** OR *young child** as search terms. PsychInfo, ERIC, MEDLINE, and Academic Search Premiere were searched for studies. These were supplemented by Google Scholar, Scirus, Google, and Ingenta searches as well as a search of an EndNote Library maintained by our Institute. Hand searches of the reference sections of all journal articles, book chapters, books, dissertations, conference papers, and other retrieved papers were conducted to locate additional studies. Studies were included if the majority of the participants were between 36 and 60 months of age, if there was information about which intervention strategies were used, and if there was an assessment of children's writing or drawing skills or abilities.

Search Results

Eleven studies were located that included 13 samples of children. The majority of the studies (N = 9) were conducted in the United States, whereas one study was conducted in Israel, and one study was conducted in Japan. Appendix A includes selected characteristics of the study participants.

CELLreviews are a publication of the *Center for Early Literacy Learning (CELL)* funded by the U.S. Department of Education, Office of Special Education Programs (Grant #H326B060010). *CELL* is a collaboration among the Orelena Hawks Puckett Institute, the American Institutes for Research, and the PACER Center.

The 13 samples included 491 children. The children's ages ranged between 24 and 67 months. The average age of the children was 47 months. In the studies where the investigators reported child gender, 52% of the children were male, and 48% of the children were female. The large majority of the children were typically developing without any identified disabilities or delays (71%). Several of the studies included cognitively and physically delayed (14%), language impaired (7%), and economically disadvantaged (7%) children.

The families' socio-economic status (SES) ranged from low to high. Four of the samples included primarily low SES background families, seven samples included primarily middle SES background families, and one sample included primarily high SES background families. All of the samples except two were conducted in preschool settings or childcare programs.

Appendix B shows the characteristics of the writing interventions that were the focus of investigation in the 13 samples. The writing activities included structured activities where children were provided guidance or prompts about what to draw or write (e.g., asked to copy specific symbols or words or complete a human figure) and unstructured activities where there were no adult guidance or prompts (i.e., draw or write what the child wanted to draw or write). Whether or not visual and verbal prompts or only verbal prompts were related to differences in the children's abilities to write or draw was also examined as part of the research synthesis. We also investigated the effects of the type of writing instrument (magic marker vs. pencil or crayon) and the number of sessions (one vs. two or more) as factors that might have influenced the writing and drawing abilities of young children.

The child outcomes that were the focus of investigation included either writing or drawing. The writing-related outcomes included name writing, word writing, and the children's writing levels. The drawing-related outcomes included drawing complexity, symbolic representation, and geometric forms. The outcome measures included behavior ratings of the writing or drawing products produced by the children or the assessments of specific developmental skills (Golomb, 1977; Levin & Bus, 2003; Lieberman, 1985; Purcell-Gates, 1996; Thomas, Rinehart, & Wampler, 1992).

A series of between intervention characteristics (e.g., verbal prompts vs. verbal plus visual prompts) and comparisons of the children's writing or drawing abilities were used to evaluate whether or not the contrasting conditions were associated with differences in the children's writing and drawing abilities. The average weighted Cohen's *d* effect sizes for the between condition differences were used to estimate the size of effects for the differences in the comparative conditions. The 95% confidence intervals for the weighted average effect sizes were used for substantive interpretation of the results where a confidence interval not including zero indicates that the average effect size is statistically significant at the $p = .05$ level.

Synthesis Findings

Appendix C lists the study comparison used in the analyses, the type of outcome measure, the dependent measure, and the Cohen's *d* effect size for the between condition differences. Figure 1 shows the results for the different types of writing outcomes. The influence of the interventions were large for name writing [$d = 0.72$, 95 % CI = .44 - 1.01], writing complexity [$d = 1.28$, 95% CI = 1.13 - 1.43], and word writing [$d = 1.77$, 95% CI = 1.36 - 2.19]. These results indicate that emergent writing was enhanced through child participation in the various interventions. The interventions had no effect on the picture or symbol drawing [$d = .24$, 95% CI = - .02 - .51] as evidenced by the 95% confidence interval including zero.

Table 1 shows the effects of the different types of intervention characteristics on the emergent writing skills of the children for the between condition differences for each characteristic (e.g., structured and unstructured activity). All of the intervention characteristics regardless of between condition differences were associated with variations in the children's emergent writing skills as evidenced by medium [$d = .62$, 95% CI = .40-.85] to very large [$d = 1.35$, 95% CI = 1.20-1.50] effect sizes and by *Z*-test results with *p* values of .0000. The between conditions comparisons, however, indicated that certain intervention characteristics were more important than others in influencing the children's emergent writing abilities. Structured activities, verbal prompts, magic markers, and interventions including multiple sessions were more effective compared to unstructured activities, verbal and visual prompts, the use of pencils or crayons, and intervention sessions lasting only one session.

The extent to which the size of the effects between the interventions and the child outcomes were moderated by year of publication, country where study was conducted,

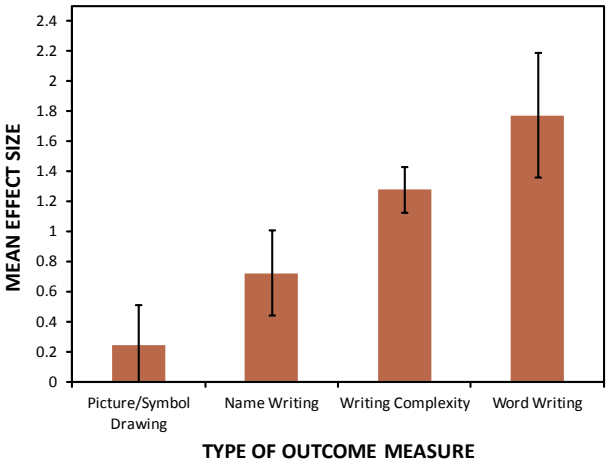

Figure 1. Average Cohen's *d* effect sizes and the 95% confidence intervals (error bars) for the influence of the writing interventions on the children's drawing and writing behavior.

type of comparison (intervention vs. no intervention or between condition comparisons), child age, child condition, and family socio-economic status are shown in Table 2. The effect sizes for the different intervention strategies and the emergent writing outcomes were all statistically significant regardless of the moderator variables as evidenced by *Z*-tests with *p*-values between 0.0018 and 0.0000. There were, however, differences between conditions for four of the six mod-

Table 1
Cohen's d Effect Sizes and 95% Confidence Intervals for Different Intervention-Related Variables

Characteristics	Number		Average Effect Size	95% Confidence Interval	*Z*-test	*p* value
	Studies	Effect Sizes				
Type of Activity						
Structured	11	21	1.07	.94 - 1.20	16.36	.0000
Free	3	6	.83	.61 - 1.06	7.19	.0000
Type of Prompt						
Verbal	5	9	1.14	.96 - 1.33	12.23	.0000
Verbal + Visual	10	17	.99	.84 - 1.14	12.70	.0000
Type of Writing Tool						
Magic Marker	5	13	1.35	1.20 - 1.50	17.58	.0000
Pencil or Crayon	5	9	.62	.40 - .85	5.41	.0000
Number of Sessions						
One	6	17	1.10	.97 - 1.24	15.90	.0000
Two +	5	8	1.26	.96 - 1.57	8.20	.0000

Table 2
Moderators of the Effects of the Writing Interventions on the Children's Writing Outcomes

Characteristics	Number		Average Effect Size	95% Confidence Interval	*Z*-test	*p* value
	Studies	Effect Sizes				
Year of Publication						
1977 - 1999	7	16	1.17	1.04 - 1.30	17.11	.0000
2001 - 2009	6	11	.66	.45 - .86	6.40	.0000
Country						
United States	10	22	1.01	.89 - 1.13	16.55	.0000
Other	3	5	.99	.70 - 1.29	6.53	.0000
Type of Comparison						
Intervention vs. no intervention	6	9	1.00	.77 - 1.23	8.49	.0000
Between conditions	7	18	1.01	.89 - 1.14	15.63	.0000
Mean Child Age						
41 to 43 months	6	14	.82	.67 - .96	11.06	.0000
44 to 56 months	6	11	1.28	1.11 - 1.45	14.41	.0000
Child Condition						
Typically developing	10	23	1.07	.95 - 1.19	17.77	.0000
Identified disability	3	4	.53	.20 - .86	3.12	.0018
Family SES						
Low	4	6	.98	.74 - 1.21	8.07	.0000
Low to high	7	16	.91	.77 - 1.04	13.33	.0000
Middle to high	1	3	1.92	1.54 - 2.31	9.76	.0000

erators. The sizes of the effect were larger for studies published between 1977 and 1999, older children, typically developing children, and families with a high socio-economic background.

Discussion

Findings showed that variations in toddlers and preschoolers writing skills were related to the types of activities provided the children and that certain characteristics of the activities were more likely to be associated with larger effect sizes. Results indicated that the use of magic markers, structured activities, and verbal prompts influenced the children's emergent writing skills, and that when the interventions were conducted over multiple sessions, the interventions had value-added effects.

It is of some interest to note that the results from the analyses reported in this *CELLreview* are somewhat different from what was found for similar analyses performed on emergent writing abilities of infants and younger toddlers (Dunst & Gorman, 2009). In the synthesis of studies of infants and younger toddlers, unstructured activities that included both verbal and visual prompts were associated with better emergent writing behavior. These findings together with those reported in this *CELLreview* indicate that what works with very young children may not work with older preschool children and vice versa.

Implication for Practice

A number of *CELL practice guides* have been developed which provide practitioners and parents different methods, strategies, and ideas for engaging infants, toddlers, and preschoolers in interest-based emergent writing activities (www.centerforearlyliteracylearning.org). The practice guides include evidence-based suggestions and guidelines for promoting children's emergent writing abilities and, in particular, name and word writing, and writing complexity. The interested reader is referred to Frisch (2006), Kaderavek, Cabell, and Justice (2009), Neuman, Copple, and Bredekamp (2000), Vukelich and Christies (2004) for additional methods and strategies for engaging young children in emergent writing activities.

References

Aram, D. (2006). Early literacy interventions: The relative roles of storybook reading, alphabetic activities, and their combination. *Reading and Writing, 19*, 489-515.

Braswell, G. S., & Rosengren, K. S. (2005). Children and mothers drawing together: Encountering graphic conventions during social interactions. *British Journal of Developmental Psychology, 23*, 299-315.

Burns, M. S., & Casbergue, R. (1992). Parent-child interaction in a letter-writing context. *Journal of Reading Behavior, 24*, 289-312.

Cabell, S. Q., Justice, L. M., Zucker, T. A., & McGinty, A. S. (2009). Emergent name-writing abilities of preschool-age children with language impairment. *Language, Speech and Hearing Services in Schools, 40*, 53-66.

Dunst, C. J., & Gorman, E. (2009). Development of infant and toddler mark making and scribbling. *CELLreviews, 2*(2), 1-16. Available at http://www.earlyliteracylearning.org/cellreviews/cellreviews_v2_n2.pdf.

Frisch, N. S. (2006). Drawing in preschools: A didactic experience. *International Journal of Art and Design Education, 25*, 74-85.

Golomb, C. (1977). Representational development of the human figure: A look at the neglected variables of SES, IQ, sex, and verbalization. *Journal of Genetic Psychology, 131*, 207-222.

Kaderavek, J. N., Cabell, S. Q., & Justice, L. M. (2009). Early writing and spelling development. In P. M. Rhyner (Ed.), *Emergent literacy and language development: Promoting learning in early childhood* (pp. 104-152). New York, NY: Guilford Press.

Levin, I., & Bus, A. G. (2003). How is emergent writing based on drawing? Analyses of children's products and their sorting by children and mothers. *Developmental Psychology, 39*, 891-905.

Lieberman, E. (1985). Name writing and the preschool child. *Dissertation Abstracts International: Section A: Humanities and Social Sciences, 46*(12), 3593.

Neuman, S. B. (1999). Books make a difference: A study of access to literacy. *Reading Research Quarterly, 34*, 286-311.

Neuman, S. B., Copple, C., & Bredekamp, S. (2000). *Learning to read and write: Developmentally appropriate practices for young children*. Washington, DC: National Association for the Education of Young Children (NAEYC).

Park, C., Weber, K. P., & McLaughlin, T. F. (2007). The effects of fading, modeling, prompting, and direct instruction on letter legibility for two preschool students with physical and developmental delays. *Child and Family Behavior Therapy, 29*(3), 13-21.

Pemberton, E. F., & Nelson, K. E. (1987). Using interactive graphic challenges to foster young children's drawing ability. *Visual Arts Research, 13*(2), 29-41.

Purcell-Gates, V. (1996). Stories, coupons, and the *TV Guide*: Relationships between home literacy experiences and emergent literacy knowledge. *Reading Research Quarterly, 31*, 406-428.

Readdick, C. A. (1994). Toddlers and preschoolers drawing with primary and standard markers, pencils, and crayons. *Journal of Research in Childhood Education, 9*, 68-74.

Standley, J. M., & Hughes, J. E. (1997). Evaluation of an early intervention music curriculum for enhancing prereading/writing skills. *Music Therapy Perspectives, 15*(2), 79-86.

Thomas, K. F., Rinehart, S. D., & Wampler, S. K. (1992). Oral language, literacy and schooling: Kindergarten years. *Reading Horizons, 33*, 149-166.

Trivette, C. M., Hamby, D. W., Dunst, C. J., & Gorman, E. (2013). Emergent writing among young children from twelve to sixty months of age. *CELLreviews, 6*(2), 1-18. Available at http://www.earlyliteracylearning.org/cellreviews_vol6_no2.pdf.

Vukelich, C., & Christies, J. (2004). *Building a foundation for preschool literacy: Effective instruction for children's reading and writing development* (Preschool Literacy Collection). Newark, DE: International Reading Association.

Yamagata, K. (2001). Emergence of representational activity during the early drawing stage: Process analysis. *Japanese Psychological Research, 43*(3), 130-140.

Appendix A

Background Characteristics of the Study Participants

Study	Number	Age (Months)		Gender		Participants	Family SES	Country	Intervention Type/Location
		Mean	Range	Male	Female				
Aram (2006) 3-4 year olds	39	42[a]	NR	20[a]	19[a]	Typically developing	Low	Israel	Public preschool
Aram (2006) 4-5 year olds	40	54[a]	NR	20[a]	20[a]	Typically developing	Low	Israel	Public preschool
Braswell & Rosengren (2005) (3 ½ year olds)	16	43	41-44	8	8	Typically developing	Middle	United States	Home
Burns & Casbergue (1992)	26	46	36-60	14	12	Typically developing	Middle to upper	United States	University nursery school
Cabell et al. (2009) (Study 1)	59	55	48-60	41	18	Language impairment	Low to upper	United States	Home
Golomb (1977) (3.3-4.2 year ods)	56	43	39-50	30	26	Typically developing	Low or upper	United States	Private nursery school or child care program
Golomb (1977) (4.3-5.7 year olds)	43	56	51-67	23	20	Typically developing	Low or upper	United States	Private nursery school or child care program
Neuman (1999) (Posttest only)	128 (71E, 57C)	42	36-48	58	70	Typically developing	Low	United States	Child care program
Park et al. (2007)	2	NR	NR	1	1	Cognitively & physically delayed	NR	United States	Special education preschool
Pemberton & Nelson (1987)	17 (9E, 8C)	44	33-57	8	9	Typically developing	Middle	United States	Preschool
Readdick (1994)	20	42	24-59	10	10	Typically developing	Middle	United States	One morning a week preschool
Standley & Hughes (1997)	24 (12E, 12C)	56	49-66	10	14	Speech impaired & typically developing	Low	United States	Pre-kindergarten early intervention program
Yamagata (2001)	21	41	36-47	10	11	Typically developing	Middle	Japan	Child care program

a Estimated from information provided in the research report.

Appendix B

Selected Characteristics of the Writing Interventions

Study	Intervention	Type of Prompt	Adult Behavior	Number of opportunities/ allotted time	Type of Activity	Type of Instrument
Aram (2006) (Alphabetic skills)	Alphabetic skills training	Verbal Visual	Not reported	50 sessions of 20-30 minutes each	Games, activities that encourage letter knowledge and basic writing	Pencils
Braswell & Rosengren (2005) (3½ year olds)	Specified set of pictures/symbols	Verbal Visual	Adult encourages child to draw	1 session of 10 minutes	Structured drawing	Crayons (structured) and colored markers (free draw)
Burns & Casbergue (1992)	Informative parental input to help child write a letter to someone	Verbal	Mother engages child in writing a letter to someone	1 session of 10 minutes	Writing a letter to someone	Primary color markers
Cabell et al. (2009) (Study 1)	Home literacy activities	Verbal	Not reported	Not reported	Home literacy activities	Not reported
Golomb (1977)	Figure drawing with visual prompt	Verbal prompt to draw a person	None	1 session	Structured drawing	Magic markers
	Figure completion with verbal prompt	Visual prompt – head couture Verbal prompt – Finish drawing a man	None	1 session	Structured drawing	Magic markers
	Figure drawing with dictation	Verbal prompt – "I am going to tell you how to draw a man"	None	1session	Structured drawing	Magic markers
Neuman (1999) (Posttest only)	Increase access to books and increase reading aloud of books	Not reported	Not reported	Not reported	Curriculum used throughout the year	Not reported
Park et al. (2007)	Use of "model, lead, and test procedure" to improve name writing	Verbal Visual	Model behavior and provided direct guidance	10 sessions of 3-10 minutes each	Structured name writing	Not reported
Pemberton & Nelson (1987)	Graphic narrative & joint drawing	Verbal Visual	Adult told a story and drew with the child	8 sessions of 15 minutes each	Structured drawing	Black or blue markers
Readdick (1994) Task 1	Home use of standard and primary markers	Verbal Visual	Adult told the child to draw shape just like the one the adult drew	1 session	Structured drawing	Standard and primary colored markers
Task 2	Home use of standard and primary markers	Verbal	Adult ask child to "Make a boy (girl)"	1 session	Structured drawing	Standard and primary colored markers
Task 3	Home use of standard and primary markers, standard and primary crayons	Verbal	Adult invited the child to draw	1 session	Free drawing	Standard and primary colored markers or crayons
Standley & Hughes (1997)	Music and writing combined	Verbal Visual	Adult embedded print awareness and writing skills instruction into music class	15 sessions of 30 minutes each	Drawing of activity done in class	Not reported
Yamagata (2001)	Complexity of figure to be completed	Verbal Visual	Asked to color or finish pictures	1 session	Structured drawing	Crayons

Appendix C

Cohen's d Effect Sizes for the Different Types of Comparative Conditions

Study	Comparison	Type of measure	Dependent Measure	Effect Size
Aram (2006)	Alphabetic skills vs. comparison group	Discrepancy score	Name writing	
			3-4 year olds	1.35
			4-5 year olds	1.16
			Word writing	
			3-4 year olds	1.38
			4-5 year olds	1.24
Braswell & Rosengren (2005) 3 ½ years old	Specified pictures/symbols vs. free drawing	Mean proportions of child behaviors	Mimicking adult's drawing	1.05
			Drawing what adult requested	.41
			Independent drawing	-0.47
Burns & Casbergue (1992)	Low vs. high informative input	Rating scale score	Child written language	3.53
			Child's directional principles	1.39
			Child's emergent writing level	1.81
Cabell et al. (2009) Study 1	High vs low frequency of home literacy activities	Rating scale score	Name writing	0.39
Golomb (1977)	Completion of a person figure vs. free drawing of a person figure	Rating scale score	Complexity of drawing	
			3.3 – 4.2 yrs	1.03
			4.3 – 5.7 yrs	0.56
	Dictation of how to draw a person figure vs. free drawing of a person figure	Rating scale score	Complexity of drawing	
			3.3 – 4.2 yrs	2.07
			4.3 – 5.7 yrs	2.54
	Dictation of how to draw person figure vs. completion of person figure	Rating scale score	Complexity of drawing	
			3.3 – 4.2 yrs	1.71
			4.3 – 5.7 yrs	2.14
Neuman (1999)	Books Aloud Program (increased access to books in classroom) vs. control group	Rating scale score	Writing level (post-test)	.63
Park et al. (2007)	Baseline vs. intervention	Number of legible letters	Name writing (P1)	2.22
			Name writing (P2)	2.68
Pemberton & Nelson (1987)	Graphic narrative/joint drawing of person vs. free drawing of person (control)	Gain score	Complexity of drawing	1.18
Readdick (1994)	Standard marker vs. primary marker	Rating scale score	Geometric forms (Task 1)	0.05
			Person drawing (Task 2)	0.09
			Symbolic representation (Task 3)	0.40
	Standard vs. primary crayon	Rating scale score	Symbolic representation (Task 3)	-0.28
Standley & Hughes (1997)	Music vs. no music	Rating scale score	Writing level	1.09
Yamagata (2001)	Circle vs. human face background	Rating scale score	Drawing complexity	0.10