Early Media Exposure: Implications for Learning

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From the beginnings of life, children in the United States grow and develop in a world of screen media. Nationally representative samples of media use patterns reveal that children 6 years and under spent a significant amount of time with screen media, mostly television and videos (Rideout & Hamel, 2006). In particular, the television set is turned on in U.S. homes for approximately 6 hours a day (Vandewater, Bickham, Lee, Cummings, Wartella, & Rideout, 2005). From 6 months to 6 years of age, children are exposed to an average of 2½ hours of media each day (Rideout & Hamel, 2006). Even infants are exposed to media 1 to 2 hours per day, a practice that violates the American Academy of Pediatrics recommendation of no screen time before age 2 (Calvert, 2006).

A high proportion of young children are also using newer media, including video games and computers (Calvert, Rideout, Woolard, Barr & Strouse, 2005; Rideout & Hamel, 2006). In one national sample of children who ranged in age from 6 months to 6 years of age, linear increases in computer usage occurred across this age range (Calvert, Rideout, et al., 2005). A shift occurred from using a computer on a parent's lap at around age 2½ to autonomous computer and mouse use at about age 3½ for children who had used computers.

There were almost no gender differences in early computer patterns. Families with higher incomes and higher education levels were more likely to own computers and to have Internet access from home. Parents perceived computers favorably for children's learning. No relationship was found between the frequency with which children played computer games and the likelihood that they could read, but increased non-game computer use was associated with increased likelihood of reading.

Effects of early television and computer exposure. Many U.S. parents believe media, particularly computers and television, are important educational tools (Rideout & Hamel, 2006). In the academic area, children's use of educational television with a cognitive curriculum was related to better reading scores, a stabilizing factor for children who were growing up in stressful home environments (Vandewater & Bickham, 2004).

While exposure to quality media content is associated with positive educational outcomes during early, middle, and late childhood (Calvert, 2008; Vandewater & Bickham, 2004), living in heavy-television households in which the television set is almost always on can be detrimental to early reading skills. Thirty-five percent of U.S. children lived in a home where the television is on "always" or "most of the time" (Vandewater, Bickham, et al., 2005). One-fifth of 0- to 2-year-olds and more than one-third of 3- to 6-year-olds had a television set in their bedroom (Vandewater, Rideout, Wartella, Huang, Lee, & Shim, 2007). Children from heavy-television households watched more television, read less, and spent less

time doing homework than other children, particularly when they had a television set in their bedroom (Vandewater, Bickham, et al., 2005). Moreover, children exposed to constant television programs were less likely to be able to read than other children (Vandewater, Bickham, et al, 2005). Overall, the data link heavy television usage, particularly in children's bedrooms, to adverse verbal literacy outcomes.

A major question of importance is if the use of interactive media, such as computers, influences children's learning more positively than exposure to television programs do. Our research on this topic has delved into the very meaning of what interactivity is. Interactivity involves a conversation, with qualities such as responsiveness, turn-taking, and contingent replies (Calvert et al., 2005).

Our research indicates that interaction with a computer program leads to engagement with, and attentional interest in, the content. For instance, preschool-age children who interacted with an educational computer story about *Blue's Clues* were more attentive over multiple exposures when the child rather than an adult had control of the mouse. Even though attentional interest was lost over repetitions when the adult controlled the mouse, there were no differences in story comprehension because the children viewed the content four times, thereby receiving adequate opportunities to rehearse the content. The major effect of interaction, then, was sustained engagement and attentional interest in the content when the child was in control of the mouse (Calvert, Strong & Gallagher, 2005).

Even though we have a good sense of what interactivity is, trying to define interactivity remains a difficulty task. For instance, young children may think they are in an interactive conversation with a media character, even though they are not. *Dora the Explorer* is a good example of what is known as a parasocial relationship, a perceived interaction with a media character which is actually one-sided. When Dora talks to children in the audience, she asks questions, pauses, listens, looks at the camera, and waits for a reply. Not only do children respond to Dora, the more they engage in actions with her, such as climbing a rope, the better they understand the story content. By contrast, children learn less story content when her questions to the audience are removed from the presentation. An interactive version of the same story, in which the child had to click on specific parts of the story to advance the program, also yielded beneficial effects for children. Overall, the results indicate that television is not necessarily a passive experience for young children. Indeed, the more they participate or interact with media characters, be they presented in a television story or a computerized one, the better they comprehend the content (Calvert, Strong, Jacobs & Conger, 2007).

Scholars from the Children's Digital Media Center are also studying when parasocial interactions emerge and begin to influence learning. In one study (Lauricella, Barr & Calvert, 2008), we manipulated a video so that the model looked directly at the audience as

she created a rattle or she looked at the rattle as she created it. With just two exposures, both treatments led to improved construction of the rattle by 18- and 24-month-old children. In fact, both of these treatments were just as good as three exposures to a live model, and all of these experiences were better than that of a control group. The results suggest that the video deficit, in which young children have difficulty in transferring what they see on a screen to real life, can be attenuated by what a video model looks at, including the child.

Conclusion. U.S. children are exposed to screen media from the beginnings of life, with media providing a backdrop for development. Although newer media are part of the experiences of early childhood, cognitive and motor limitations prevent much use of newer media until at least age 2½ . Thus, television and video exposure remains the dominant kind of media experience for very young U.S. children. During the preschool years, control of the computer has strong effects on children's engagement with the task. Exposure to both television and computer content can enhance learning of media content, either by participating with a character and acting on the content or by directly interacting with the educational content.

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