

## Perspective: Potential Effects of Young Children’s Virtual Experiences on their Brain Development and Other Areas of Development

**Doris Bergen\***

*Distinguished Professor Emerita, Miami University, Ohio, USA*

**\*Corresponding Author:** Doris Bergen, Distinguished Professor Emerita, Miami University, Ohio, USA.

**Received:** February 22, 2018; **Published:** March 26, 2018

As a patron in an upscale hotel restaurant, I was sorry when a couple with a screaming baby sat down in the booth next to us. The screaming lasted only 5 minutes though and miraculously there was no sound from the infant for the rest of our mealtime. As we were leaving the restaurant I looked at the booth to see whether the infant was asleep or just happy and engaged, but what I saw made me wish the child had screamed throughout my dinner. The baby was slumped forward in a zombie-like fashion with his eyes focused on a small electronic screen! Apparently, the parents had used their phone’s virtual screen to keep the child quiet during the entire mealtime! This is not the first time I have observed parents using the addictive quality of electronic devices to keep their children quiet. I have observed a year-old child, mouthing a pacifier, as he fingered objects on a virtual screen for 45 minutes while sitting next to his mother in a doctor’s waiting room; a three-year-old watching a Disney movie on an electronic screen for almost an entire airplane flight; a whining, tired child being silenced by a phone video; and an infant watching images on the parent’s phone while he was being diapered!

As a specialist in early childhood development and play and an author of recent books on brain development and potential effects of electronic devices on young children [1,2], I am especially concerned about the ways that many parents now are using such virtual materials to “manage” their very young children. It appears that the environments of such young children are now beginning to include increasing amounts of exposure to virtual media experiences, and, unfortunately, these may be replacing many important real world active and socially relevant interactions. For example, diapering is usually a time when adults talk or sing to their babies; waiting room time often includes parent talk about various activities or book reading with a child; tired, fussy children can be hugged and talked to instead of being consoled by phone images; and long airplane trips can be a time for children to learn about the experiences of such adventures as flying. Perhaps the parents I observed earlier also provide their children with many face-to-face playful experiences, including some in the natural world. However, in many families the virtual world seems to be taking over much of the time that young children used to spend in interactive play experiences.

Presently we do not know what the long-term developmental effects of pervasive exposure to virtual media will be. However, what we do know is how important early concrete experiences are for young children’s brain development and there is much theory and research describing the roles that positive playful adult/child early social interactions and how young children’s early manipulative and pretend play with interesting physical objects in their environment support such development [3]. There is also extensive information now available about how much important human brain development occurs during the first few years of life [4]. Because such extensive synaptic growth occurs during this age period, the physical, social, and play experiences of young children are important factors affecting how their brains will be configured.

According to Bruner [5], children’s earliest representations of knowledge are based on their physical experiences with the environment, which results in “enactive representation”. He states that later cognition, involving iconic representation (symbols, pictures) and symbolic representation (language), have their basis in this embodied type of cognition that is typical during the infant years. Piaget [6]

also has discussed extensively how young children's play, including sensorimotor play with objects, early pretense, and early games with rules are all vital for children's cognitive growth. More recent researchers and theorists have also spoken to the importance of such embodied cognition for infants and young children [7]. While little is presently known about how virtual devices interact with the process of synaptogenesis in young children, it seems reasonable to assume that these experiences would also affect this process and thus, that interaction with such devices will have an important effect on the cognitive, emotional, and social development of young children.

Those who see many exciting prospects for technological advances that enable humans to go beyond their physical capabilities may find young children's adaptation to a virtual world a positive human developmental trajectory. For example, Kurzweil [8] has predicted that nanobots inserted in human brains within the next 20 years will give humans much more brain power, resulting in more varied sensory experiences and greater knowledge, and Scott [9] has described how new forms of technology may result in super-intelligent robots that humans can use to advance medical practice, scientific exploration, and creative performance. However, for developmental researchers and theorists, as well as for many parents and educators, virtual electronic "progress" is raising human development questions. Already there are reported concerns regarding how some aspects of older children's social, emotional, and cognitive development may be affected negatively by present day technology-augmented experiences [10-12].

Developmental researchers, pediatricians, and early childhood educators must make young parents aware of the importance of maintaining human interaction and playful real-world experiences for their infants and young children. It is especially important that they make parents of young children aware of how their actions and uses of virtual media may affect their children's brain development. Because I am at the end stages of my career, I cannot conduct the needed longitudinal research or provide the educational leadership concerning these issues. It is my hope, however that serious study of the developmental effects of young children's extensive exposure to these virtual devices will be undertaken by the many professionals who are concerned about early child development. Education that addresses this important issue should be provided to all parents, because they must be made aware that the actions they take in exposing their infants and young children to virtual experiences may be creating differences (potentially both positive and negative) in the brain development of their young humans, and these changes in human brains will ultimately affect the future both of human society and human survival.

### Bibliography

1. Bergen D., *et al.* "Technology play and brain development: Infancy to adolescence and future implications". New York: Taylor & Francis (2016).
2. Bergen D., *et al.* "Brain research in education and the social sciences: Implications for research, parenting, and future society". New York: Routledge (2018).
3. Bergen D. "Does pretend play matter? Searching for evidence: comment on Lillard *et al.* (2013)". *Psychological Bulletin* 139.1 (2013): 45-48.
4. Bergen D and Woodin M. "Neuropsychological development of newborns, infants, and toddlers". In Davis AS, & D'Amato RC (Eds.). *Handbook of pediatric neuropsychology*, Springer (2011): 15-30.
5. Bruner JS. "The course of cognitive growth". *American Psychologist* 19.1 (1964): 1-15.
6. Piaget J. "Play, dreams, and imitation in childhood". London: Heinemann (1945).
7. Smith L and Gasser M. "The development of embodied cognition: Six lessons from babies". *Artificial Life* 11.1-2 (2005): 13-29.
8. Kurzweil R. "The singularity is near: When humans transcend biology". New York: Penguin (2005).

9. Scott G. "Visualizing the future". *The Futurist* 48.4 (2014): 20-23.
10. Bauerlein M. "The dumbest generation: How the digital age stupefies young Americans and jeopardizes our future (or, don't trust anyone under 30)". New York: Penguin (2008).
11. Goodman SE., *et al.* "Cyberspace as a medium for terrorists". *Technological Forecasting and Social Change* 74.2 (2007): 193-210.
12. Ybarra ML and Mitchell KJ. "Sexting and its relation to sexual activity and sexual risk behavior in a national survey of adolescents". *Journal of Adolescent Health* 55.6 (2014): 757-764.

**Volume 7 Issue 4 April 2018**

**©All rights reserved by Doris Bergen.**