

Preface

The New Blooming, Buzzing Confusion: Introduction to Media Exposure During Infancy and Early Childhood

The baby, assailed by eyes, ears, nose, skin, and entrails at once, feels it all as **one great blooming, buzzing confusion** (p. 488; William James, 1890)

William James's conception of the infant captured the prevailing view that the infant's world is dominated by sensations that lack order and assail themselves on the infant as if, as Locke argued in 1689, the infant is a "white paper [tabula rasa] void of all characters, without any ideas" (Book II, Chap. I, 2). This view has dominated developmental psychology even into the late twentieth century: infants were thought to be born knowing little of their larger world and, over time and with experience, must organize the buzzing confusion. This phrase, while not unique to the study of media and subsequent effects on infants (e.g., Anderson & Hanson, 2010), was the impetus for this book. Infants are not born into a world of confusion; instead, they are sophisticated learners with functional memory systems (for review see Rovee-Collier, Hayne, & Colombo, 2001; Saffran, Aslin, & Newport, 1996) who develop gradually and systematically across the first few years of life. As we sat in Rachel's garden creating a prospectus for this book, our goals were twofold. First, we wanted to encourage scholars who study media and young children to present complex and scientifically rich descriptions of their own research programs by focusing on how very young children might learn from media and the ways in which the content of said media and the context surrounding exposure interact to influence how and whether learning occurs. Second, we wanted leading industry experts, content creators, journalists, and policymakers to read these scholarly chapters and discuss the relevance and application of this research for their own practice. In all, we wanted the research and its translation into practice to present a more nuanced and balanced view of babies and screen media that reflects a rigorous application of developmental science to how, whether, and why infants learn from screen media.

Current Media Landscape

Since 1997, there has been an unprecedented surge in media content produced for young children coupled with the advent and rapid mass production of touchscreen tablets and mobile phones. In just the 2 years between 2011 and 2013, the use of mobile devices skyrocketed: use by children under 2 increased from 10 to 38 % whereas use by children 2–4 years old increased 39 to 80 %. But a more recent study conducted in France (Cristia & Seidl, 2015) estimated that 58 % of 5–24-month-olds had used a touchscreen device. Smartphones comprise the most frequently used touchscreen device (51 % of children have used this device at least once) although tablets are close behind (44 %; Rideout, 2013). Estimates of daily usage also vary. Recent studies one in the USA (Rideout, 2013) and one in France (Cristia & Seidl, 2015) indicate that about 20 % of infants and toddlers use a touchscreen-enabled device each day. Two studies with more racially and socioeconomically diverse samples, one in the USA (Kabali et al., 2015) and one in Northern Ireland (Ahearne, Dilworth, Rollings, Livingstone, & Murray, 2016), indicate a much higher estimate, approximately 70 %. While it is important to note that the way these data have been collected also varied over time (see Barr, Danziger, Hilliard, Andolina, & Ruskis, 2010; Certain & Kahn, 2002), it is quite clear that children's exposure to screen media is shifting across platforms. Unlike any other point in time, young children are exposed to media content via multiple devices in multiple locations and in multiple formats, potentially leading to a new blooming, buzzing confusion. This technology explosion is shifting the use of screen media from a centrally located television set in the family's living room to anywhere and everywhere a child might be. From the family car to the local restaurant, while visiting the doctor's office and when riding on public transportation, exposure to media content is inescapable. As researchers and industry leaders, it is challenging to keep pace with such rapid proliferation in order to generate basic evidence about its effects as well as guidance on just what families and educators can or should do.

Moral Panics About Children's Time Spent with Media

As each new wave of technology takes hold, different facets of the population express varying opinions about the role that such technology should play in young children's lives ranging from trepidation about the perils to extreme optimism about the promise of the technology (Chap. 1). McLuhan (1964) wrote that "each new technology creates an environment that is itself regarded as corrupt and degrading" (p. ix). The promise lies in the ability of media to widely and rapidly increase children's access to information and education (Mielke, 1994). At the same time, others have voiced concerns that early use places young children's developing attentional system at risk for concurrent and later developmental problems while simultaneously disrupting sleep and displacing important childhood experiences. Throughout

the book, how parents and early educators are responding to these profound changes to the media landscape is discussed. The context in which media exposure occurs is more relevant and important than ever before.

Historically, child media research has focused on relations between outcomes and the total amount of media exposure a child has (see Anderson, Huston, Schmitt, Linebarger, & Wright, 2001 for a discussion). This narrow focus on amount of exposure has constrained our ability to interpret both the short-term and long-term impact of media on early socio-cognitive development and slowed the accumulation of knowledge about which child when exposed to what content and under what circumstances experiences particular outcomes. As the field matured, there was a shift from total effects to an examination of the differential impact of media content. Multiple studies document that high-quality and well-designed educational media help young children learn the content featured in that media. For instance, in a longitudinal study following children from age 5 to age 15, researchers determined that young children who spent more hours viewing Sesame Street evidenced higher grades, more leisure book reading, and stronger academic self-concepts in adolescence whereas young children who spent more hours viewing Mr. Rogers had higher creativity scores and reported greater participation in creative extracurricular activities (e.g., drama, art; Anderson et al., 2001).

At present, there is a dizzying array of content options available for young children. The Apple app store contains well over 80,000 applications tagged as educational (Apple, 2015). Unlike the development of traditional television content (both educational and entertainment), the speed with which new technologies are created has led to an equally rapid explosion and deployment of content for these technologies. As a consequence of the academic research process, we know very little about how this new content delivered via new technologies is developed, whether it is developmentally appropriate, and, perhaps most importantly, whether and how it is effective for learning. To deal with the lag between technology and research, Zosh and colleagues (Chap. 17) have proposed ways to identify app-based content as truly educational by using basic learning science research.

Welcome to the New Blooming, Buzzing Confusion

This book was born from an invitation by Springer to consider submitting an edited volume that investigated the consequences of early media use; and so began our own blooming buzzing confusion. We met the challenge by inviting many of the top academics in the field to author chapters on the perils and promise of early media exposure firmly embedded within a developmental science perspective. As we considered their potential research topics, we simultaneously identified key industry leaders and child advocates who could comment on the implications of the research for their own practice. Consequently, this book moves the research debate from the early focus on cause/effect relations dominated by total exposure and even total exposure broken into content categories to models where multiple and interacting

factors of the child, the content, and context in which exposure occurs are considered (Barr & Linebarger, 2010; Guernsey, 2012). Through careful consideration of the potential interactions between and among the content and context of early media exposure, we will address under what conditions this new blooming buzzing confusion can be deciphered by young children including how they come to make sense of it. These issues are timely and relevant not only to academics but also to parents, early educators, and policymakers who are making key decisions about their children's access to, use of, and potential learning from media.

The book is structured to present information from different perspectives. Each research chapter provides state-of-the-art research about the content and context of media exposure during early childhood. Known leaders of industry and parenting advocacy groups and think tanks were then asked to write a commentary chapter to provide insight into how the research is or could be translated into practice. These research and practice chapters are designed to be read together. By highlighting both research and practice, we have been able to review and identify factors that might realize the promise of technology while simultaneously reducing or mitigating the potential risks for very young children.

We identified several crosscutting themes across the chapters and commentaries. These themes demonstrate how research that incorporates greater complexity and sophistication across questions, methods, and theories enhances our understanding via simultaneously considering the multiple and interacting effects of individual child characteristics, content type, and the context in which exposure occurs. These themes include:

1. *Cognitive constraints on the child.* Throughout the book we will closely consider how the age of the child influences learning. We consider attentional and cognitive constraints on processing information from screens during early childhood (Chaps. 3 and 5) and how these factors influence children's ability to learn in media settings. We discuss the relevance of developmental science principles in understanding not only how children learn from technology but in the design of media content and consideration of the context of learning as well.
2. *Importance of the delivery of content.* The delivery of media content will be discussed from multiple perspectives, with consideration of preschool television content (Chaps. 7 and 8), the development of characters (Chaps. 9 and 10), and the development of touchscreen apps (Chaps. 3, 4, 17, and 18). We discuss the importance of character development, the careful design of the educational and prosocial content, and the need to develop and implement age-appropriate curriculum and leveling. We also discuss how it may be possible to use features of new media to more effectively level content to capitalize on technology but we will also need to carefully consider how to focus the learning without overwhelming young learners with extraneous information.
3. *Importance of the context.* Co-viewing is now extended to co-using and joint media engagement. More than ever before it is important to consider how learning from media occurs in the context of other social partners. We focus on impacts of parental mediation and scaffolding during media exposure (Chaps. 11–15).

4. *Shift to newer media devices*—There has been a rapid adoption across socioeconomic status of touchscreen-enabled phones and tablets and a vast array of software in the form of applications (apps) has been developed to deliver content on these devices. These new devices are mobile making them available in multiple locations. These devices are interactive both due to the touchscreen-enabled functionality and the connectivity with other devices in order to engage in activities like videochat. These dramatic changes in technology have increased the contingency and interactivity of content available to young children. We will expand upon the recent dramatic shift to mobile and interactive technology (Chaps. 1, 2, 13, 17, and 18). We integrate the extensive findings obtained from the study of children's exposure to television to the more recent findings with this new digital media. We also discuss the challenges of the new media.
5. *Parenting and educational implications of early media exposure*. Throughout the book we consider the educational ramifications of new media content and devices and the role that parents and early educators will need to play in order to maximize child outcomes. This will be considered from the Science of Learning perspective (Chap. 17), in the early education environment (Chaps. 1–4 and 6), and from the parenting perspective (Chaps. 11–16).

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