Article

Finding Orchids in a Field of Dandelions: Understanding Children's Differential Susceptibility to Media Effects

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Jessica Taylor Piotrowski[1] and Patti M. Valkenburg[1]

Abstract

Most youth and media researchers do not believe that media affect all youth in the same manner or to the same degree. While most media effects theories reflect this belief, empirical efforts often do not. Rather than conceptualizing individual differences as noise or nuisance variables, we argue that the future of media effects research lies within understanding these differences. To that end, the aim of this article is to help youth and media researchers identify appropriate moderators for study inclusion. We discuss the concept of differential susceptibility, with a particular focus on the differences between orchid and dandelion children, highlighting theoretical and empirical applications of this susceptibility paradigm to media effects research. We believe that a more integrative approach to youth and media research, built on a differential susceptibility paradigm in which moderators are thoughtfully integrated a priori, can provide us with nuanced answers to the complex questions associated with youth and media effects.

Keywords

adolescents, children, differential susceptibility, moderators, youth

> For some children under some conditions, some television is harmful. For other children under the same conditions or for the same children under other conditions it may be beneficial. For most children under most conditions, most television is probably neither particularly harmful nor particularly beneficial. This may seem unduly cautious, or full of weasel words, or, perhaps, academic gobbledygook to cover up something inherently simple (. . .). We wish it were. Effects are not that simple.
>
> —Schramm, Lyle, and Parker (1961, p. 3).

[1]University of Amsterdam, Amsterdam, Netherlands

Corresponding Author:
Jessica Taylor Piotrowski, Amsterdam School of Communication Research, University of Amsterdam, PO Box 15793, 1001 NG Amsterdam, Netherlands.
Email: j.piotrowski@uva.nl

Most youth and media researchers do not believe that media affect all youth in the same manner. In fact, as demonstrated in the quote above, even the earliest researchers who investigated the role of media in children's lives made the clear point that media effects do not equally hold for all children. And while most media effects theories reflect this belief, our empirical efforts often do not (Valkenburg & Peter, 2013a). Instead, in many media effects studies, individual differences are conceptualized as either noise or nuisance variables (Nabi & Oliver, 2009). For example, studies that employ experimental designs often do not consider individual differences because random assignment is argued to cancel out these differences (Nabi & Oliver, 2009). Similarly, in cross-sectional and longitudinal studies, we see that individual-difference variables are often statistically controlled for rather than formally investigated as potential moderators of the relationship between independent and dependent variables. While these approaches are analytically sound, they indicate a mismatch between media effects *theories* and media effects *research* (Valkenburg & Peter, 2013a).

If we, as scholars, agree that the media's influence on youth is not monolithic, then our empirical approaches should reflect this. By ignoring conditional media effects, not only are we disregarding key theoretical propositions that are central to many media effects theories (e.g., general aggression model, Anderson & Bushman, 2002; reinforcing spiral model, Slater, 2007) but we are also putting ourselves at increased risk for drawing invalid conclusions about the magnitude of media effects (Valkenburg & Peter, 2013a). After all, as Valkenburg and Peter (2013a) note, the consistent pattern of small effects sizes that is found in most youth and media research may be small because the true effects are diluted across too many individual differences. As a result, we may be (unintentionally) ignoring a sizeable minority of youth for which the effects of media are much more pronounced (Valkenburg & Peter, 2013a). Rather than conceptualizing individual differences as noise or nuisance variables, we argue that it is imperative for our hypotheses to reflect a priori *for whom* media effects should occur or particularly occur. In other words, our hypotheses should identify which children are particularly susceptible to the influence of media and which are not. To that end, the aim of this article is to help youth and media researchers identify appropriate moderators for study inclusion. By introducing the concept of differential susceptibility, as well as theoretical and empirical applications of differential susceptibility (e.g., Cantor & Wilson, 1988; Fikkers, Piotrowski, Weeda, Vossen, & Valkenburg, 2013; Nikkelen et al., 2014; Valkenburg & Peter, 2013b), we hope to encourage researchers to take a more nuanced approach to their youth and media investigations.

Differential Susceptibility: Dandelion and Orchid Children

For several decades, students and researchers across a range of academic disciplines (e.g., child development, family studies, psychology) have argued that select individual characteristics of children make them particularly *vulnerable* to adverse experiences which subsequently place them at risk for poor development (Belsky,

Bakermans-Kranenburg, & van IJzendoorn, 2007). There is a large body of empirical literature across these disciplines to support this argument. For example, babies who scored high on negative emotionality at 12 months of age and who experienced unsupportive parenting during their second and third year of life scored highest on externalizing problems such as disruptive and aggressive behaviors at 36 months of age (Belsky, Hsieh, & Crnic, 1998). Similarly, children who were negatively reactive as infants and received harsh parental discipline prior to school entry demonstrated the most externalizing problems during the early school years (Deater-Deckard & Dodge, 1997). Despite this evidence, in more recent years, Belsky et al. (2007) have questioned whether this largely disproportionate focus on vulnerable children, adverse environments, and problematic outcomes is the best approach. Instead of looking for characteristics which increase a child's *vulnerability* to a specific situation, Belsky et al. (2007) have proposed that researchers should investigate characteristics which affect a child's *differential susceptibility* to specific situations (see also Pluess & Belsky, 2013).

Although the terms of vulnerability and susceptibility are often used interchangeably, Belsky and colleagues argue that these are in fact different, although related, concepts. Vulnerability (also known as dual risk) is thought to occur when the most vulnerable children (i.e., children with a particular "risk" characteristic) are disproportionately affected in an adverse manner by a negative environment but do not *also* benefit disproportionately from a positive environment (Belsky et al., 2007). And while this perspective is reasonable and accurate for many situations, it is also possible that these characteristics—rather than acting as a unidimensional risk factor—may operate in a bivalent manner (Boyce & Ellis, 2005). In other words, certain characteristics may lead to disproportionately adverse consequences in negative environments but *also* disproportionately beneficial consequences in positive environments. This situation—when a specific organismic characteristic (e.g., genetics, temperament) leads to adverse or beneficial consequences depending on the environment—has been coined differential susceptibility (Belsky, 1997; Belsky et al., 2007).

To illustrate the concept of differential susceptibility, consider research on infants' negative emotionality and parenting. Initially, researchers found that the combination of negative emotionality and unsupportive parenting led to the greatest externalizing problems—thus supporting a vulnerability (dual-risk) perspective (Belsky et al., 1998). Follow-up work, however, has revealed a more complex relationship. Not only does the combination of negative emotionality and unsupportive parenting result in the *greatest* externalizing problems, but the combination of negative emotionality and supportive parenting results in the *least* externalizing problems. In other words, infants with high negative emotionality also benefitted disproportionately from supportive environments (Belsky et al., 2007; Boyce & Ellis, 2005).

Researchers have suggested that this evidence for differential susceptibility (also referred to as reactivity) may reflect one's heightened biological sensitivity to both harmful and protective contextual effects (Boyce et al., 1995). There exist numerous examples of highly reactive children who, in adverse situations, experience the greatest negative psychiatric and biomedical outcomes when compared with their more

normatively reactive peers (e.g., Belsky et al., 1998; Deater-Deckard & Dodge, 1997). Likewise, there are many examples of highly reactive children who, in beneficial situations, experience substantially lower problems than their more normatively reactive peers (e.g., Blair, 2002; Kochanska, 1997). Boyce and colleagues argue that these findings indicate there is a subset of children who are uniquely sensitive to the influence of environmental conditions (Boyce & Ellis, 2005; Boyce et al., 1995). To describe these sensitive children, Boyce and Ellis (2005) use the well-chosen metaphor "orchid children"—just the like flower, these children are able to develop beautifully in conditions of support and nurture but promptly decline in conditions of neglect. In contrast to these orchid children, the majority of children are conceptualized as dandelions—relatively hardy and able to survive and thrive across a range of environments (Boyce & Ellis, 2005; Ellis, Boyce, Belsky, & Bakermans-Kranenburg, 2011; Kennedy, 2013).

As new research on differential susceptibility emerges, it is likely that the binary distinction between orchid and dandelion children will evolve to better reflect a continuum of susceptibility. However, as Kennedy (2013, p. 320) argues, this metaphor is a powerful one that reminds us not only of the complex process of human development but also of the fact that we, as researchers, can easily "lose sight of the upside—the potential for those considered at risk to do best and benefit most when offered optimal care." Identifying dandelions and orchids, we believe, is a worthwhile direction for youth and media research. The question is: How do we find the dandelions and how do we find the orchids? The answer may lie in obtaining a better conceptualization of children's susceptibility to media.

Children's Susceptibility to Media

There is not one characteristic that is likely to make a child fall into the category of orchid or dandelion when it comes to media effects. Rather, there are many different individual differences that may reflect susceptibility to media effects. In the psychological literature, where the concept of differential susceptibility first emerged, these individual differences have been broken down into three categories: genotypic (e.g., dopamine receptor DF-74 gene, Bakermans-Kranenburg & van IJzendoorn, 2006), endophenotypic (e.g., cortisol reactivity, Obradovi, Bush, Stamperdahl, Adler, & Boyce, 2010), and phenotypic (e.g., temperament, Pluess & Belsky, 2009). Valkenburg and Peter (2013b) have used and extended the differential susceptibility paradigm to focus specifically on susceptibility to media effects. They suggest that, when considering media effects, individual differences can be grouped into three types of susceptibility: dispositional, developmental, and social susceptibility.

Dispositional susceptibility is defined as "all person dimensions that predispose the selection of and responsiveness to media" including genetics, gender, temperament, personality, cognitions, values, attitudes, beliefs, motivations, and moods (Valkenburg & Peter, 2013b, p. 226). While some of these dimensions are more stable across time (e.g., temperament), others reflect more transient dimensions (e.g., mood). Developmental susceptibility is defined as the "use of and responsiveness to media

due to cognitive, emotional, and social development" (Valkenburg & Peter, 2013b, p. 227). Lastly, social susceptibility is defined as all social-context factors that can influence children's use of and responsiveness to media including micro-level contexts such as friends and peers, institutional contexts such as school or work, and societal contexts such as cultural norms and values (Valkenburg & Peter, 2013b). To help researchers conceptualize the role of these variables in the media effects process, Valkenburg & Peter (2013b) have posited an integrated model of media effects known as the differential susceptibility to media effects model (DSMM).

The Differential Susceptibility to Media Effects Model

Building off many of the propositions of earlier media effects theories (e.g., social cognitive theory, Bandura, 1986; the (limited) capacity model, Fisch, 2000; Lang, 2000; reinforcing spiral model, Slater, 2007), the DSMM was designed to explain theoretically why some individuals are more susceptible to media effects than others. The DSMM has several propositions. We will discuss three of them here: (a) media effects are conditional and depend on the three types of susceptibility variables; (b) media effects are indirect, in the sense that they are moderated by three types of response states (cognitive, emotional, and excitative); and (c) the differential susceptibility variables have two different roles in the media effects process, they act as predictor of media use, and as a moderator of its effects.

Proposition 1: Media Effects Are Conditional

The DSMM posits that media effects are conditional and are dependent on three types of differential susceptibility variables (i.e., the dispositional, developmental, and social susceptibility variables). These three variables can exert a unique moderating influence, but they can also exert an interactive moderating function. For example, sensation seeking (i.e., dispositional variable) may only or particularly be influential in the media violence-aggression relationship during adolescence and not during childhood and adulthood (i.e., a developmental variable). Likewise, certain restrictive parental mediation strategies may only be effective in childhood and no longer in adolescence (Nathanson, 2001).

Proposition 2: Media Effects Are Indirect

The DSMM states that all media effects are indirect and mediated by the cognitive, emotional, and excitative response states of the media user. The media response states of users originate from media use. In the DSMM and other media effects theories, these response states are conceptualized as the route to media effects. The cognitive response state refers to the "extent to which media users selectively attend to and invest cognitive effort to comprehend media content" (Valkenburg & Peter, 2013b, p. 228). This state includes the processing, attention, retention, and absorption of media content. The emotional response state reflects all affectively valenced reactions to media messages and

characters (e.g., sadness, fear, happiness). The excitative response state reflects the degree of physiological arousal in response to media content. Each of these three response states is expected to vary in response to different media.

Most earlier media effects theories assume that the way in which we react to media content and technologies predicts the nature of media effects. For example, the effects of an educational program on comprehension and learning occurs via the cognitive effort invested in the program (cognitive response state), and, depending on the type of the educational program, possibly also via the child's affective reactions (emotional response state) to the characters or the program. Likewise, the effect of a violent computer game on aggression may occur via the child's attention to the violent acts, his or her affection for the violent characters, and/or the arousal elicited by the program. In the DSMM, these three response states are conceptualized as mutually exclusive states that can occur simultaneously. It is thus possible that a particular stimulus may elicit high cognitive, emotional, and excitative responses. However, it is equally possible that a particular stimulus, such as pornography, may invoke an excitative state with less cognitive or emotional responses. This proposition highlights the criticality of media processing in understanding media effects. An adolescent who experiences an excitative response to sexual content, for example, is expected to be affected differently when compared with an adolescent who does not experience a similar response.

Proposition 3: The Differential Susceptibility Variables Have Multiple Roles

The three types of differential susceptibility (dispositional, developmental, and social) variables are posited to have two conceptual roles. First, they predict selection of and exposure to media. Second, they stimulate or reduce the influence of media by influencing how an individual responds to the media. In other words, they moderate the effect of media use on the response states mentioned in Proposition 2. The simultaneous roles of *dispositional* susceptibility variables as both predictors of media use and moderators of response states is known in the DSMM as the disposition-content congruency hypothesis (Valkenburg & Peter, 2013b). The hypothesis states that media which are congruent with one's disposition is more likely to induce media effects when compared with incongruent media. Research has shown that children are most likely to seek out media that matches their dispositions (Oliver, Kim, & Sanders, 2006). For example, children who are high in trait aggression are more likely to seek out violent media (Valkenburg & Peter, 2013b). However, dispositionally congruent media also influence how a child responds to media content. Media content that is congruent with one's disposition creates a sense of familiarity (Valkenburg & Peter, 2013b). Because of this sense of familiarity, dispositionally congruent content can be processed with less cognitive effort (Fisch, 2000). And, as a result of the (illusion of) familiarity associated with congruent media content, such content is often emotionally processed as more pleasurable, eliciting more positive affective reactions (Reber, Schwarz, & Winkielman, 2004).

Developmental susceptibility can also act as both a predictor of media use and a moderator of the response states. This simultaneous role is explained via the moderate-discrepancy hypothesis, which states that individuals prefer content that is only moderately discrepant from their age-related schemata and emotional experiences (Valkenburg & Peter, 2013b; see also Valkenburg & Cantor, 2000). The DSMM posits that moderately discrepant content will moderate response states because, by virtue of its familiarity, it is processed more fluently. As a result, cognitive processing will be decreased. Moreover, since moderately discrepant content may activate a semantic network of connections, cognitive, and excitative states may be influenced as well.

Lastly, *social* susceptibility factors may also predict the media children use and how they respond to these media. In addition to normative culture influencing the type of media that children use (Thompson, Pingree, Hawkins, & Draves, 1991), there are specific contexts that may restrict or regulate media use (e.g., parents, siblings, institutions, Jordan, 2004; Nathanson, 2001). Furthermore, explained via the context-content convergence hypothesis in the DSMM (Valkenburg & Peter, 2013b), media responses are likely to be amplified when the messages converge with user's social environment (via resonance, Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002) or weakened when the messages contradict the user's social environment (via dissonance, Festinger, 1957). It is also possible that that contradictory information may amplify media's influence when the social environment is perceived as less credible.

Empirical Investigations of Differential Susceptibility to Media Effects

Given the relative recency of the concept of differential susceptibility, it is unsurprising that there are few exemplars of this approach in the media effects literature. In fact, there exist no empirical investigations on how dispositional, developmental, or social susceptibility variables may enhance both the negative and positive potential of the media on children. Instead, the literature is punctuated with examples of research investigating only one side of this equation with most media effects studies taking a vulnerability (dual-risk) perspective as opposed to susceptibility perspective. Since vulnerability is half of the susceptibility paradigm, these studies provide initial evidence to support a susceptibility approach to the study of media effects.

Dispositional Susceptibility Evidence

Although there is some evidence that dispositional variables, such as temperament, mood, existing values, and genetic factors, predict media use (Oliver et al., 2006), there is less evidence of the moderating role of disposition in media effects research. The most comprehensive test to date of children's dispositional susceptibility to media investigated the relationship between genetic disposition, violent media use, and attention deficit hyperactivity disorder (ADHD)-related behaviors. Nikkelen et al. (2014) hypothesized that children with a genetic susceptibility to ADHD-related behaviors would be more likely to use violent media content. They argued that children with this

genetic susceptibility are more likely to show low levels of arousal, and as a result, to seek out arousal-enhancing activities such as violent media to reduce this unpleasant state. They also hypothesized that children with a genetic disposition to ADHD-related behaviors would be more susceptible to the influences of media violence compared with children with a different genetic disposition. Results indicated that children with a genetic susceptibility to ADHD (i.e., who possessed the long variant of the 5-HTTLPR-gene) were more likely to use violent media. However, the strength of the relationship between violent media use and ADHD-related behaviors did not vary by genotype. Nikkelen et al. (2014) suggest that this may indicate that the individual genes that predict behavior, such as media violent use, are not necessarily the same genes that moderate the effects of that behavior.

Developmental Susceptibility Evidence

Most of the research on the role of development as a predictor of media use and moderator of media responses has focused on children. This research has shown that development is one of the strongest predictors of media use, both in childhood and in adolescence (Valkenburg & Cantor, 2000; Valkenburg & Peter, 2013b). The moderating role of development has also been convincingly demonstrated. Developmentally speaking, we know that children in early childhood have difficulty with the distinction between reality and fantasy in the media, focus their attention on perceptually salient content, have less domain-specific knowledge to which they can relate new media content, and struggle with perspective taking (Piotrowski, Vossen, & Valkenburg, 2015; Valkenburg & Cantor, 2000). Around age 7, children are able to differentiate reality from fantasy, focus less on perceptual characteristics, have more domain-specific knowledge, and can understand another's perspective (Piotrowski et al., 2015; Valkenburg & Cantor, 2000). Given these cognitive changes, it is logical that fantasy content and content that portrays an outwardly threatening appearance is much more frightening to younger children whereas content which relies on realistic threats and implicit motives is much more frightening to older children (Cantor & Wilson, 1988). Meta-analytic work has similarly revealed that the influence of media violence on aggression is more prominent for preschool-aged children than for older children and adolescents (Paik & Comstock, 1994). Conversely, compared with younger children, the influence of prosocial content (i.e., less salient and more complex) on prosocial behavior tends to be the most prominent around age 7 (Mares & Woodard, 2007). Even the advertising literature points out this developmental distinction with research showing that children younger than 8 years are particularly influenced by advertising (Blosser & Roberts, 1985), reflecting their inability to understand persuasive intent (Rozendaal, Buijzen, & Valkenburg, 2010).

Comparable to research with young children, there is far less attention paid to the role of development on the media use and media experiences of adolescents and emerging adults. This is surprising when one considers the significant amount of pubertal and cognitive changes that occur during adolescence (Piotrowski et al., 2015) and the socioemotional changes that are characteristic of emerging adulthood (Coyne,

Padilla-Walker, & Howard, 2013). This notable gap highlights an important opportunity for future developmental susceptibility research.

Social Susceptibility Evidence

In recent years, studies of social susceptibility have also begun to blossom. Most of these studies have focused on home variables, such as parental mediation, family conflict, and parenting behavior. There is, to our knowledge, less research into children's broader environment. Fikkers et al. (2013) conducted a longitudinal investigation to determine whether the influence of media violence on aggression was particularly robust for adolescents growing up in homes with high family conflict. Based on Valkenburg and Peter's (2013b) context-content congruity hypothesis, the authors found that the consistency of messages in both the media environment and household environment resulted in a double-dose effect, that is, increased aggression among adolescents. Adolescents growing up in high-conflict households who consumed a heavy diet of media violence exhibited more aggressive behavior than their peers who had a similar heavy diet of media violence, but grew up in low-conflict households.

Similarly, Vandewater and Huang (2006) conducted a correlational investigation to determine whether the influence of television viewing on overweight was more pronounced for children growing up in homes with at least one obese parent. The authors suggested that youth with obese parents may be particularly vulnerable to food advertisements because their parents are more likely to buy and consume such foods. Results illustrated that parent obesity (characteristic of an obesogenic environment) did moderate the relationship between television viewing and child weight status. Viewing television was associated with childhood overweight for adolescents with at least one obese parent, whereas there was no relationship between viewing and overweight status for adolescents with no parental history of obesity.

Moving Forward

The studies presented above are notable as they made a clear effort to identify for whom media influence was particularly strong. This is a valuable contribution to the empirical literature. However, future research can extend these studies by moving beyond the vulnerability (dual-risk) paradigm, which is characteristic of these studies, toward a more comprehensive differential susceptibility paradigm. In the case of Nikkelen et al.'s (2014) genetic disposition study, for example, a next step would be to investigate whether this particular genotype is associated with the selection and experience of positive media content. Null results would suggest that this genotype is a vulnerability characteristic. Alternatively, results that illustrate that children with this genotype flourish when exposed to positive media content would indicate that this genotype represents a differential susceptibility characteristic—helping us identify orchid children.

The fact that so many media effects studies focus on the vulnerability side of the equation is not surprising. When moderators are included in media effects research

with youth, they are typically evaluated from one perspective. In some cases, researchers ask how select characteristics may heighten the negative effects of media, while in other situations researchers ask how select characteristics may either serve to buffer negative effects or bolster the positive effects of media. As noted earlier, Fikkers et al. (2013) found that a risky home environment (i.e., high family conflict) exacerbates the influence of media violence on adolescents' aggressive behavior. Similarly, longitudinal research has shown that sexual inexperience exacerbates the negative influence of sexually explicit Internet material on adolescents' sexual satisfaction (Peter & Valkenburg, 2009). On the other hand, there is evidence that young children who struggle with literacy deficits learn particularly well from literacy-based educational television programming (Linebarger, Kosanic, Greenwood, & Doku, 2004) and that the effect of school-readiness-focused programming is particularly pronounced among children most at risk cognitively and economically (Baydar, Kağitçibaşi, Küntay, & Gökşen, 2008).

Studies such as these have provided critical information for researchers, caregivers, and public policy makers on possible ways to mitigate the negative consequences associated with media use and reinforce the positive effects associated with media use. Yet they also reflect the fact that many of our efforts to understand who is influenced by media are progressing tangentially to, rather than integrally with, one another. By studying individual characteristics and outcomes associated with exposure to only one content type, we are not seeing the entire picture. Learning that children from high-conflict families are influenced by media violence more strongly than their peers who do not live in high-conflict homes is undoubtedly valuable information. But we also have the opportunity to learn whether these same children experience prosocial media exposure more intensely as well. Similarly, learning that economically at-risk children are able to capitalize on the promises of educational television is critical knowledge. But, again, we also could study whether these children experience the negative influences of violent content more strongly. In both situations, not only would we have critical information on differential susceptibility factors (i.e., high-conflict homes; economic disadvantage), but we would have information that could dramatically alter the impact of our research and the interventions that build upon it. Such an integrated approach to the study of moderators will allow us to identify which specific characteristics (dispositional, developmental, or social) may reflect differential susceptibility to the media, and thus help us identify which children are orchids and which are dandelions.

Conclusion

As the quote on the first page by Schramm et al. (1961) reads, media effects are not that simple. There are many factors that help explain whether and how media will influence media users. And yet, all too often, media effects research does not capture this complexity. While in certain situations it may be reasonable to treat individual differences as noise to be cancelled out, we would argue that the future of media effects research lies in understanding—rather than cancelling—these differences. As

youth continue to spend significant portions of their daily life with media, questions as to how these media are affecting them will remain important avenues for investigation. A more integrated approach to youth and media research, built upon a differential susceptibility paradigm in which moderators are thoughtfully integrated a priori, can provide us with nuanced answers to these complex questions.

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Author Biographies

Jessica Taylor Piotrowski is an associate professor in the Amsterdam School of Communication Research (ASCoR) at the University of Amsterdam. She is the director of the Center for research

on Children, Adolescents, and the Media at ASCoR as well as the Vice Chair / Chair Elect of the Children, Adolescents, and the Media division of the International Communication Association. Her research investigates how children process and comprehend media content with specific attention to the potential benefits of media. Her work has been presented at numerous conferences and published in communication, psychology, health, and education journals.

Patti M. Valkenburg is a distinguished university professor at the University of Amsterdam, and research professor at the Amsterdam School of Communication Research. Her research involves the interplay between child development, media-specific parenting, and media effects. She has published more than 120 theoretical and empirical articles on the cognitive, emotional, and social effects of media and technology on children and adolescents. Her work has received numerous awards, including an Advanced Grant from the European Research Council and the Spinoza prize, the highest Academic award in the Netherlands.