YouTube Kids: The App Economy and Mobile Parenting

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Abstract
This research investigates the growing relationship between media industries and the everyday viewing patterns and lives of young children. Specifically, this research focuses on the development of the YouTube Kids app, with well over 10 million downloads, which seeks to capture and monetize youth attention. These channels have taken advantage of emerging mobile and tablet technologies to target very young children and infants (aged 0–5 years). The technologies are also a part of larger parenting practices through the watching of televisual content by children on mobile phones and tablets. The rise of mobile parenting is allied with a confluence of digital technology, parenting practices, and the configuring of young children as a target demographic. Part of the work the YouTube Kids app performs is to corral young children into a controlled space without unexpected participation and play, where a more monolithic category of "child" or "kid" viewership can be codified and marketed to within the constraints of the app.

> "When we were kids, if we wanted to learn more about gorillas or how to make friendship bracelets, our parents pointed us to an encyclopedia, or took us to the library. When we wanted to watch cartoons, we eagerly awaited Saturday morning. Today's kids have it even better . . ."
>
> (Google Official Blog, 2015)

> "Families worldwide are watching millions of videos on YouTube. And lately, those of us at YouTube have been working on a new way for our kids—and yours—to discover and explore videos on every topic in, well, the universe."
>
> (Google Official Blog, 2015)

This research investigates the growing relationship between media industries and the everyday viewing patterns and lives of young children. Specifically, this research focuses on the development of the YouTube Kids app, with well over 10 million downloads, which seeks to capture and monetize youth attention. After the development of this app has come a wave of concurrent apps internationally (DisneyLife, Sky Kids, etc.), which are designed to increase mobile video data usage, as kids programming is becoming a larger part of digital business models. Currently, some of the most popular/profitable YouTube channels on the entire YouTube platform are directed toward children as a demographic

(examples include channels such as FunToyzCollector making just under 5 million dollars a year with 379 million monthly views and LittleBabyBum at 3.4 million dollars a year with 270 million monthly views, excluding endorsements or other paid business deals; Ferenstein, 2015). These channels have taken advantage of emerging mobile and tablet technologies to target very young children and infants (aged 0–5 years). The technologies are also a part of larger parenting practices through the watching of televisual content by children on mobile phones and tablets. In fact, as of 2016 10% of YouTube views come from content labeled as kids entertainment, and in some countries, the number represents half of all views on the entire YouTube platform (Mulligan, 2016).

A large body of research exists alongside public health debates about the role of media in the lives of infants, especially related to education and learning (see Rideout & Hamel, 2006, for a review of the "media family"; Zack, Barr, Gerhardstein, Dickerson, & Meltzoff, 2009; Zimmerman,

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Christakis, & Meltzoff, 2007). The research for this article, however, follows Nansen's (2015) media studies approach to researching children's media by focusing on the "everyday encounters and entanglements with mobile media and communication technologies" (para. 1) rather than tracking medical and educational literature's concentration on "discourses of promise or peril" (para. 1). This move away from effects the research allows for a focus on media industries and the app economy within the context of everyday infant media usage.

The rise of mobile parenting is allied with a confluence of digital technology, parenting practices, and the constitution of young children as a targeted demographic and imagined audience. While these changes influence all ages of children, this research is focused primarily on infants, toddlers, and preschoolers. Elsewhere this age grouping (0–5 years) has been labeled as "digitods" or children who have grown up with touch screen access since birth (Holloway, Green, & Stevenson, 2015). In a survey of research on children's usage of mobile devices and apps for learning, Chiong and Shuler (2010) conclude, "studies reported here demonstrate that young children are using smart mobile devices: Many have access to them, they like them, and they are good at using them" (p. 28). It is clear that infant usage of digital and mobile technology is prevalent and increasing among younger and younger children. What is less understood and far less researched is the role of recent apps as a focal point in mobile mediality and in the media ecosystems of infants' digital media consumption.

This article first offers an overview of apps and provides a justification for studying apps through a media studies and political economy approach, as opposed to an effects model. Next, the app economy is identified and connected to YouTube's move into the children's entertainment space. The app itself is then analyzed, and two prominent YouTube channels are examined. Finally, this article discusses how infants are being configured as a key target demographic and the role of algorithms in constituting algorithmic infants.

Why Study Apps?

Media industries have always imagined children as audiences in specific ways, but digital companies are beginning to augment this by designing for child and infant engagement. Mobile media companies (including the telecom industry and hardware manufacturers) have historically never considered infants as a part of their target demographics. It is only with the ubiquity of mobile phone penetration in conjunction with the advent of touch screen interfaces that infants have begun to manipulate mobile technology (Ólafsson, Livingstone, & Haddon, 2013). Touch screen tablets, for example, are increasingly used in the home as a source of literacy skills as a result of the simplistic tactile operation (Neumann & Neumann, 2014). More important for this research, children under the age of 4 years use smartphones and the Internet predominantly to watch video clips (CHILDWISE, 2012; Findahl, 2014; Teuwen, De Groff, &

Zaman, 2012). In Sweden, "67 percent of 2-year-olds use the Internet and 32 percent do so daily" (Findahl & Davidsson, 2015). After compiling second quarter Nielson data from 2010 to 2014, Dixon (2014) concludes, "Television watching in the home has declined in each of the last three years in the 2 to 11 year olds, down from 110.3 hours per month in 2011 to 102.9 hours in 2014" (para. 3). While television viewing may have declined, Internet video consumption has shot straight up, "The 2-11 year olds increased Internet video watching by 87%, to 6.3 hours a month, in just the last year" (para. 4). This shows a marked shift in consumption patterns that YouTube has set out to monetize within the shifting terrain of the televisual media landscape.

The YouTube Kids app was launched in response to anxiety from parents about children watching too much adult content within the broader YouTube network. Parents have the ability to select an age range and timer for the app (after which it will lock). However, the result is children are now directly advertised to, creating a political space of branding and lucrative children's marketing. Leaver (2016) reminds us in an analysis of the *Angry Birds* franchise that apps are an integral part of social network markets and are "far from straightforward" (p. 221). The YouTube Kids app extends the reach of YouTube the company and the platform into the lives of young children.

Apps are a powerful part of emerging media ecologies, aligning with the mobility and integration of software and hardware in a networked era of connectivity. Apps work across multiple mediated devices from smartphones to tablets/laptops (and increasingly with smart TVs), and this suppleness embeds the technology, and by extension YouTube itself, into the everyday lives of families. Johnson (2015) refers to this as the "appification" (para. 3) of social life in a study of pregnancy and monitoring apps with "wider cultural and social changes in the understanding of our identity, our 'lifestyle' and our body" (para. 2). With regard to children, educational toys and apps targeted at kids are already a multimillion-dollar industry with over 80,000 educational apps appearing on the iTunes store platform (Yelland, 2015). Apps and their attendant affordances deserve careful consideration within the study of social media. Thus far that has not been the case as there is, "surprisingly slim literature on the structure and political economy of mobile industries" (Goggin, 2014, p. 3), and little focus directly on the importance of apps (Goldsmith, 2014; but see Nieborg, 2015, for an analysis of the Candy Crush Saga).

Indeed, as Leaver (2016) points out, apps as software systems are "in a state of continual change" (p. 222), which intertwines the evolving flow of content from company to child through the conduit of the app. In fact, part of the work the YouTube Kids app performs is to corral young children into a controlled space without unexpected participation and play, where a more monolithic category of "child" or "kid" viewership can be codified and marketed to within the constraints of the app.

The App Economy

It is no exaggeration to say that the current app economy is a booming and important component of the emerging mobile and creative media industries (Goldsmith, 2014). Apple reported that in 2014, the App Store generated "$10 billion in revenue for developers" (Monaghan & Neumayr, 2015). According to the research conducted by the International Data Corporation, in the year 2015, "direct (non-advertising) revenue from mobile app installations was around $34.2 billion. In 2020, direct revenue is forecast to be $57 billion, a figure that equates to a compound annual growth rate of 10.6%" (Bolton, 2016). The information technology research and advisory company Gartner also finds an increased diversification of apps away from just games and toward increasingly "personalized data streams" (van der Meulen & Rivera, 2014). Technology and business analyst Horace Dediu (2015) goes so far as to say, "Including all revenues, apps are still likely to be bigger than Hollywood. But there's more to the story. It's also likely that the App industry is healthier" (para. 7–8). Regardless, the current status of the app economy is robust and likely expanding.

The term "app economy" finds its origins in the Year 2009 (certainly connected to a 2009 BusinessWeek cover story title "Inside the App Economy"), as companies started recognizing the number of apps being downloaded, the profitability of companies such as Zynga at the time, and the potential for in-app purchases (MacMillan, Burrows, & Ante, 2009). Mandel (2012) offers one of the most authoritative definitions of the app economy when he says from an economic perspective:

> (w)e can think of the App Economy as a collection of interlocking innovative ecosystems. Each ecosystem consists of a core company, which creates and maintains a platform and an app marketplace, plus small and large companies that produce apps and/or mobile devices for that platform. (pp. 2–3)

YouTube is one of these companies capitalizing on the emergent app ecosystem, which has arisen with the development of mobile technology. While YouTube has continually garnered increases in viewing time on the platform, it is really channels (defined as individuals or groups posting content to the YouTube platform) focused on family and children's content that have seen the most dramatic raises in viewing time. The impetus for the development of the YouTube Kids app, then, focuses on both profitability and protecting/preserving this trend in children's viewing habits. The group project manager for the app, Shimrit Ben-Yair, is quoted in *USA Today* as saying, "(Year over year) we've seen 50% growth in viewing time on YouTube, but for our family entertainment channels, it's more like 200%" (della Cava, 2015, para. 3). This statistic shows just how important younger children are to the future growth of YouTube viewership. Certainly the increase in family channel viewing time by 200% represents a significant and rising source of revenue for YouTube as a parent company but also for the individual channels focusing on children's content.

This move to corner the children's viewing market is part of a larger media shift toward targeting children as media consumers. Netflix commissioned 300 hr of original programming aimed at children (Fritz & Hagey, 2013) and continues a strategy to court younger viewers (cord-nevers) who watch videos on streaming sites instead of on cable television (Brouwer, 2015). Amazon Prime and Hulu launched their own original children's programming shows, while Rovio has expanded its Angry Birds franchise partly through the streaming of its ToonsTV Angry Birds cartoons (Dredge, 2015). Disney even jumped into the digital fray with the purchase of multichannel network (MCN) Maker Studios. The meteoric success of the Pokemon Go app has rebooted the franchise and buoyed Nintendo's stock from a single app.

YouTube's Kids

However, it is YouTube, and by extension parent company Google, that have directly benefitted from the explosion of infant viewing. Google considers the YouTube Kids app as the "first building block in tech for tykes" (Google Official Blog, 2015) as the company attempts to monetize infants and toddlers as a demographic. In fact, 5 of YouTube's top 10 most viewed channels in the month of April 2016 were from the "Kids and Family" genre. When combined the five channels together generated 2,403,103 views during April alone, according to Tubular (Marshall, 2016). To sustain the growing and lucrative kids market, however, YouTube needed to keep parents happy and ward off criticism that its content was unsafe and putting children in close proximity to adult entertainment.

The development of the app, therefore, shielded YouTube from criticism that the platform was exposing children to adult content without parental supervision. Launched on 23 February 2015, YouTube positioned the app as a safe space and solution to many of the problems with digital parenting in an era of smartphones and tablets. The app has a simple minimalist layout and large icons for easy touch and navigation. It is supported on a variety of consoles and smart TVs (including streaming intermediaries such as Chromecast, Roku, and Apple TV), which makes it easy to access the app across a variety of screens in the home. The channels and playlists are divided into just four categories for browsing on the home page. These categories include Shows, Music, Learning, and Explore. Playlists can also be guest curated by YouTube and have included celebrities (Geena Davis and Amy Poehler's Smart Girls) and branded content such as "National Geographic Kids" (Google Official Blog, 2015). The app contains a search function that can allow children to seek out content beyond what is "explicitly included and organized into the app's various sections. Parents, of course, can disable search from the parental controls, but many may not be aware this option exists or that they should make the change" (Perez, 2015). This was part of a Federal Trade Commission (FTC) complaint filed on 19 May 2015, by two consumer groups,

the Center for Digital Democracy and the Campaign for a Commercial-Free Childhood (2015), about the ease of access to inappropriate adult content through the app. YouTube countered by pointing to its flagging system where videos can be marked, reviewed, and removed from the app. However, YouTube did make concessions about its filtering of videos for the app and began a new two-step policy wherein, "new content would be doubly filtered for quality control in the future, first algorithmically then by an internal team that would manually sample videos for quality control" (Perez, 2015). The algorithm sorts videos into the four channel categories, but it is unclear how much manual human intervention is exercised over content. As a result, some videos with embedded adult content, such as a "daddy finger" Deadpool dressed Mickey Mouse shooting a gun at a family of Deadpool dressed mice, can slip through the cracks of the algorithmic filtering (Peters, 2016).

The design and ease of usage is not by accident and can be categorized as a form of "ludic capitalism" where labor is play, and play is increasingly laborious (Galloway, 2012, pp. 27-29). Consider some of the wording from the "YouTube Official Blog" (2015) on the day of the apps release:

> Your 4-year-old may already be a swiping expert, but the app's design makes it even easier to find Pocoyo or the latest episode of *Sesame Street*'s The Furchester Hotel. With larger images, bold icons and more, it's fast and simple for little thumbs to navigate . . . For years, families have come to YouTube, watching countless hours of videos on all kinds of topics. Now, parents can rest a little easier knowing that videos in the YouTube Kids app are narrowed down to content appropriate for kids. (para. 3)

Notice the tacit acknowledgment of YouTube's public problem with swiping as a form of "accidental media usage" (Nansen, 2015) for infants and young children stumbling into adult content. This should come as no surprise to parents of children with access to smartphones and tablets. As Nansen (2015) points out, accidental media use is a natural extension or domestication of mobile media into the lives of infants through technological affordances with "screens lighting up through touch prompts interest, interaction, and even habituation through gestural interaction" (para. 10). My three children under the age of 5 years (the youngest about to turn 2 years) can all locate the YouTube icon and push on videos, often tapping on multiple videos rapidly to scan and scroll through different automated lists of options before settling on the desired video. On the smartphone, the ability to minimize a video while it is playing and scroll through other options means that children can quickly navigate through hundreds of content options without any programming knowledge other than tactile swiping and scrolling. This is aligned with Nansen's (2015) findings that despite children's knowledge of navigating technology, the design of apps and touch screen interfaces produce "accidental forms of media engagement," which are a "regular consequence of these ambient contexts, interfacial affordances and early encounters with mobile media" (para. 12). The app is positioned as the solution to parental problems.

Another noteworthy design choice for the app and the fillip for a second FTC complaint against the app is the inclusion of advertising on the platform. Within its "YouTube Kids Parental Guide," the company states that it allows "Paid Ads" within the app "so that we can offer it for free" (YouTube Kids Parental Guide, 2016). The section on advertising on YouTube Kids also communicates the company's strong stance that videos uploaded by individual users on their own channels "are not subject to our advertising policies ***regardless of the nature of the content***. Users often upload commercials and other promotional materials to their YouTube channels, and these videos may appear in the app" (YouTube Kids Parental Guide, 2016, emphasis original). The basis of the complaint from a number of watchdog groups argues that YouTube Kids deceptively intermingles commercial content with children's content and slips branded, undisclosed "unboxing" content of toys and candy under the guise of organic, user-generated content. We now pivot toward probing two of these channels, which are not only popular within the YouTube Kids app but are also some of the most popular channels on the entire YouTube platform.

FunToyzCollector

Researching infant engagement with media presents a bit of a methodological conundrum and certainly much-needed attention to ethical guidelines and conventions. This is one of the reasons that the app is used as the object of study in this research, and the research is based on a more critical cultural and political economy analysis. The FunToyzCollector channel was selected for textual analysis in order to understand how the app enters into the everyday media assemblages of homes and the viewing patterns of infants and small children. The channel was specifically selected because it has been extremely successful and influential with regard to viewer metrics and revenue generated, not only within the Kids genre but across all of YouTube. Postill and Pink (2012) advocate a "critical shift from the analysis of online communities to that of digital socialities" (p. 5). Their conception of "social media ethnography" is a composite of practices that become intertwined (Pink, 2009). Christine Hine (2011) believes the "Internet encourages us to move away from a model of ethnography focused on intensive engagement within a single site, towards a more fluid, mobile and connective form of fieldwork" (p. 570). Thus, attention to channels emphasizes the ways in which media practices interface with everyday life and industry constraints.

FunToyzCollector (formerly known as DisneyCollector and DC Toys Collector) is a YouTube channel that started 13 April 2011. At the time of this writing, the channel has over 7.5 million subscribers and has generated 11 billion views. The channel was the top-earning channel based on

subscribers and views in 2014 at US$4.8m, but this figure does not include any of the lucrative endorsement deals or paid business the channel could be generating. While almost all top grossing YouTube channels are signed to MCNs, FunToyzCollector has remained independent and anonymous. The channel owners' face is never shown on camera, and all interview requests have heretofore been denied. All of the videos on the channel show the unboxing of toys and candy and two hands (famous for elaborate fingernail paintings and dubbed "the richest hands on the Internet") with a woman's voice narrating over the entire process. Multiple investigations into the identity of the channel owner in late 2014 and 2015, when the popularity of the channel reached mainstream media coverage could only locate the origins of the videos being from Florida (the *Daily Mail* has since claimed that the owner is Brazilian Daiane DeJeus, citing neighbor testimony and an elbow scar; Thompson, 2015).

The channel has helped pioneer a genre of YouTube videos labeled "unboxing" videos. While videos of children waiting to open birthday and Christmas presents have long existed on YouTube, FunToyzCollector is the first channel to garner this kind of widespread attention and appeal directly to kids themselves. The videos, on average, are 4–9 min in length and show the hands opening an array of candy eggs (like Kinder Surprise eggs) and toys displaying children's programming such as Peppa Pig, Dora the Explorer, Disney Princesses, and Minions. The most popular video on the channel, with just under 500 million views, is titled "Play Doh Sparkle Princess Ariel Elsa Anna Disney Frozen MagiClip Glitter Glider Magic Clip Dolls." The video methodically goes through each of the Princesses and shows the hands making dresses for the princesses out of Play-Doh as a tutorial on how to play with the combination of the two. Viewers get to see the toys and respond to the surprise in uncovering what is inside. The channel description, written by the channel owner, says, "Welcome to Disney Collector Toy Channel all about kid-friendly videos for toddlers, babies, infants and pre-school children. I review toys n dolls from Disney, Pixar, Nickelodeon, Play Doh, Claymation and much more!" (Fun Toys Collector, 2016). This very unassuming, benign description gives a small glimpse into the target demographic of the channel. Toddlers and even babies are recognized as the core audience for the eggs, and the connection to prominent brands is not hidden.

Content is now merging with marketing and advertising and being delivered directly to children. In the videos, the audience has no way of knowing whether or not the channel owner is receiving compensation for making a video and unboxing a particular product. With FunToyzCollector, we just see the hands opening the treats and merchandise, but with other unboxing channels such as EvanTubeHD (making over an estimated US$1.3m a year in 2014—the number has grown since then), you get to see another child doing reviews, playing with toys, and making recommendations (Moss, 2014). While FunToyzCollector is not signed to an MCN,

EvanTubeHD is signed to Maker Studios, which is a part of Disney. Evan's father, Jared, states in an interview with *Newsweek* that the channel has a "dedicated sales team that sells ads and negotiates deals with brands and businesses" (McCoy, 2013, para. 13). This blurring of boundaries with unboxing is amplified within the YouTube Kids app. Children are positioned as the latest form of "influencers," an industry term used to describe nontraditional celebrities who are perceived to be in closer proximity to audiences. Influencers are important to advertisers in an era of digital clutter because they have a direct connection with audience members and are believed to hold sway over purchasing decisions. In an interview with the Associated Press (2014), Marc Rosenberg, a Chicago-based toy consultant, stated, "Kids trust other kids more so than they would an adult" (para. 4). Whether this is true or not, the industry views these children as conduits through which they can condition purchasing habits from birth. Unboxing videos act as a kind of mini-infomercial spurring aspirational purchasing. Multiple corporate entities are monetizing this trust within the YouTube Kids app.

Discussion

Ito et al. (2010) in their landmark interrogation of kid's digital media usage and learning identify three "genres of participation" as "hanging out, messing around, and geeking out" (p. 31). These categories operate as an organizing framework or media ecology for understanding the "affinity spaces" (Gee, 2005) of young people. However, this genre-based approach is largely built to unpack participation from teenage users and some younger children. Parents relying on the YouTube Kids app are not encouraging the formation of community, sharing, or multitasking but are parenting within the bounded space of the app. Invoking De Certeau (1984), YouTube's creation of the YouTube Kids app operates as a strategic logic, wherein the company attempts to establish the strategic place of infant viewing. Below I identify two seminal strategies YouTube employs to control and capitalize on infant attention and viewing patterns.

Infants as Target Demographic

The YouTube Kids app is designed to impact the consumption patterns of infants. Certainly, one of the main driving forces behind the success of the YouTube Kids app, if not the overriding impetus, is children deriving a great deal of pleasure in their consumption choices. They enjoy watching eggs being opened and the surprise that enchants their browsing and viewing. They also are actively engaged and participating in the digital flow of consumption, despite the constraints placed on them by the app. Kids learn at an early age to navigate the world of advertising; they click off of ads after 5 s (if the ad will allow it) or jump from video to video until they find desired content without ads. Many engage in multitasking or other activities while waiting for the advertising to

end. It would be wrong to lump all children into a single category of mindless consumers.

And yet, early on in the history of advertising, the Federal Communications Commission (FCC) made a clear distinction between advertising to adults and children on television (Chester, 2015). Such distinctions no longer exist in the world of Internet marketing and advertising. Although we must acknowledge the participatory elements within this target demographic, it in no way absolves advertisers from targeting and conditioning toddlers, while constituting infants as capitalist consumers. Even more insidious is the potential for data mining and recommendation systems built from birth and fed to advertisers and brands, all in the service of a conglomerate such as Google. YouTube Kids becomes a branded space for advertisers to have free reign to connect with infants. This data collection is continuing to expand. For example, Genesis Toys Internet-connected toy doll "My Friend Cayla" is the subject of an FTC complaint alleging the doll collects "children's voice recordings and other personal data" and then transmits the data to a smartphone app to generate responses (Wells, 2016). Apps marketed to children need to be recognized as advertising spaces by regulators and parents.

Moving beyond questions of advertising, digital companies such as Google are imagining and actively constituting infants as a specific demographic. Infants are seen as an untapped market that can grow up alongside brands and products at an impressionable age. Companies can cut through the digital clutter of modern Internet advertising and build a relationship with the very youngest of consumers. Unfortunately, along with that relationship also comes an accompanying data-driven profile literally from birth. Recently, Google spelled out in a notice labeled, "YouTube Kids Privacy Notice" how YouTube Kids collects information on children and users. The information collected includes the device information (hardware model, operating system, or unique device identifiers), IP address, log information such as how the app is used, event information, or any details about viewing. Also collected through mobile identifiers, which act similarly to cookies, are "preferred language, watch and search history, and other settings" (YouTube Kids Parental Guide, 2016). The notice does state that personal information such as names, addresses, or contact information are not stored. Yet, advertisers are paying to increase brand awareness and promote aspirational purchasing within this emergent target demographic.

Algorithmic Infants

Algorithms are part of an assemblage of mobile media infrastructure and design, which combines the social and technical into a data ecosystem that seamlessly connects users' preferences and predilections with conglomerates. YouTube's usage of algorithms works to target children directly through the YouTube Kids app. However, algorithms are positioned as the solution to the complications of fragmentation for media industries in an era of globalization. Algorithms that YouTube employs impact audiences through recommendations and filters. Algorithms work discursively to position infants as consumers. This discursive positioning of the audience through the algorithm we can label "algorithmic infants."

Algorithms are a growing area of academic interest and inquiry. The term has taken various shapes in recent scholarship and industry discourse ranging from the "addressable audience" to "algorithmic identity" (Cheney-Lippold, 2011). The study of algorithms and accompanying "algorithmic culture" (Hallinan & Striphas, 2016) is devoted to understanding the role that algorithms play in shaping digital life. Gillespie (2014) states, "we are now turning to algorithms to identify what we need to know is as momentous as having relied on credentialed experts, the scientific method, common sense, or the word of God" (p. 168). Much faith is placed on the validity and legitimacy of algorithms to, in fact, impact decision making of audiences and consumers. Scholars speak of "power through the algorithm" (Beer, 2009; Lash, 2007), especially through recommendation algorithms and social networking sites. "Algorithms play an increasingly important role in selecting what information is considered most relevant to us, a crucial feature of our participation in public life" (Gillespie, 2014, p. 167). Algorithms are socio-technical processes, which, at their most basic level, are a formula or code that solves an unambiguously assigned problem. In an era of "Big Data," algorithms become seminal to search functions and organizing data. Nansen (2015) calls this "automated media use" wherein software automates the "process of sorting and shaping information, and in doing so both empowers and governs forms of infant media conduct" (para. 24). Algorithms are now an interstitial part of parenting in an age of mobile technology. Algorithms can serve as a kind of surrogate parent that shapes the viewing habits of a child and both explicitly and implicitly instructs infant consumption. Tablets and mobile technology are understood to be a part of parenting as babies and toddlers are entertained, but in ceding that task to the safe confines of the YouTube Kids app, algorithms continually operate. This is all the more important as the younger the child, the more recommendations and filters work to guide viewing. The younger the child, the more impactful the algorithm and the app structure on viewing.

Nansen, Chakraborty, Gibbs, MacDougall, and Vetere (2012) believe that there exists a responsibility to "equip children with the knowledge and skills to be active, ethical and critical participants online" (p. 237). The YouTube Kids app is part of an app economy increasingly directed toward occupying children's attention and monetizing the space. The algorithm replaces the parent as a curator of consumption choices as parenting is further ceded to the algorithm. Apps hold tremendous power within the shifting terrain of mobile technology and parenting as part of the emergent

strategic logic of companies to advertise and market—to extract value from YouTube's kids. Ultimately, we must collectively ask whether we want algorithms and advertisers to have unfettered access to infants and children.

Declaration of Conflicting Interests

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