

From Musical.ly to TikTok: Social Construction of 2020's Most Downloaded Short-Video App

MILOVAN SAVIC

Swinburne University of Technology, Australia

High-quality smartphone cameras and user preferences for visual expression propelled the proliferation of short-video apps. This article takes a closer look at the emergence of one such app—Musical.ly (i.e., TikTok as we know it today). Using the social construction of technology as a theoretical lens, the article demonstrates how Musical.ly was co-constructed through the interplay among the app, its users (preteens), and nonusers (parents and regulatory bodies), while acknowledging the specific social and cultural context in which it emerged. The article argues that parents' and preteens' diverging interpretations of Musical.ly as a creativity tool, on one hand, and an adult-free social network centered around performativity and play, on the other, appeased moral panic that typically surrounds children's digital media use and supported the app's rapid uptake.

Keywords: Musical.ly, short videos, TikTok, preteens, social constructivism

As user preferences pivoted toward visual online communication, complementing the written word with images and videos produced on high-quality smartphone cameras, short video apps inundated the market. Still, one app's success was unparalleled. This app is today widely known as TikTok, but at the time of its emergence, it was called Musical.ly.

Compared with other short-video applications, Musical.ly had two very distinctive characteristics: rapid growth and user demographics. In its first two years (between 2014 and 2016), the app reached 200 million users, with 60 million active users accessing the app daily. It was trending on both Google's and Apple's app stores (Savic, 2020). To put this into perspective, such growth was significantly higher than Facebook's and Twitter's own growth during their emergence phase. Furthermore, Musical.ly's user base dominantly consisted of preteens (Rettberg, 2017)—an untapped and fiendishly difficult-to-penetrate niche for social media.

At the time of Musical.ly's uptake, a number of other social media platforms attempted to enroll preteens to their services. For example, between 2013 and 2017, several child-friendly versions of mainstream apps were launched, including SnapKidz, YouTube Kids, and Facebook's Messenger Kids (Leaver, 2017). However, when it comes to preteen users, social media apps face two key challenges: obtaining parental approval and appealing to preteens' preferences for online engagement. Parental decision

Milovan Savic: milovan@posteo.net

Date submitted: 2021-02-04

Copyright © 2021 (Milovan Savic). Licensed under the Creative Commons Attribution Non-commercial No Derivatives (by-nc-nd). Available at <http://ijoc.org>.

making is guided by their assessment of whether the app is harmful to their child (boyd, Hargittai, Schultz, & Palfrey, 2011). Therefore, first, apps need to bypass parents as gatekeepers controlling which platform their children can access and under what circumstances (Savic, 2020). Second, apps need to offer a playful, parent-free environment that is attractive to this age group. While children's engagement with digital media is primarily led by play and entertainment (Nansen, Chakraborty, Gibbs, MacDougall, & Vetere, 2012), preteen users also seek online spaces, allowing them break free from their parents' watchful eye (Pangrazio & Cardozo-Gaibisso, 2020).

Taking on a social constructivist lens, in this article, I will discuss the case of Musical.ly's emergence—how the app positioned itself as a tool for creative expression, rather than a social media platform both to appeal to the preteen demographic and to circumvent typical parental concerns around social media. By maintaining its identity as a short-video-making app perceived as benign and oriented toward fostering creativity, Musical.ly (and later TikTok) was able to bypass parental gatekeeping strategies to reach preteen audiences.

Next, I will analyze how, on the initial successful market penetration, the app further developed at the intersection of user preferences, nonusers' perceptions, and social context. Through careful catering to its users but also nonusers, Musical.ly evolved into a platform for entertainment, as well as building and sustaining social relationships, incorporating elements of Instagram, Snapchat, and YouTube.

This article aims to unpack the complexities of agency attributed to the technology itself (its designers), users (preteens), and nonusers (parents and regulators) in the making of TikTok, by using the theory of social construction of technology (SCoT) as an analytical framework. In doing so, I will demonstrate that TikTok—currently the most successful short-video app—did not come fully formed, but is instead the result of the dynamic among platform, users, and nonusers.

Methods and Research Design

This article draws on the data collected as part of a larger qualitative study examining social media use among families with preteen children in Melbourne, Australia, in 2016. The total sample included 15 Melbourne-based families with the eldest child between 10 and 15 years old.

The time of data collection coincided with the emergence of a new, at the time largely unknown to adults, short-video app, called Musical.ly. Having had the unique opportunity to observe family dynamics during the platform's early evolution, in this article, I set out to answer the following question:

RQ1: How did ongoing dynamics among the app, users, and nonusers shape Musical.ly in its uptake phase?

Data collection included separate in-depth interviews with one of the parents and the eldest child in each of the families ($N = 30$). With this approach, I managed to capture their respective understandings of Musical.ly, its features, affordances, and perceived purpose. The interviews with children were complemented by social media tours—a child-guided display of social media use. This method was informed

by work exploring personal, social, and cultural aspects of social media use (Jørgensen, 2016; Light, Burgess, & Duguay, 2018; Robards & Lincoln, 2017), ensuring that the participants had full control over their disclosures while guiding me through the use and interpretations of the app's affordances.

Assisted by NVivo, data was thematically analyzed using "narratives in interaction" (Bamberg, 2005, p. 221) as an approach. Narratives in interaction prompt researchers to look at not only what is said but also what remains unarticulated. Taking contextual cues into account was important because of the newness of Musical.ly. Musical.ly was rarely referred to directly when adult participants were talking about their child's social media use. The data was used to build narrative case studies of the families where Musical.ly appeared as a negotiated social platform. Parents were not generally aware of Musical.ly and its features, and the young people interviewed were only in their first few months, sometimes even weeks, of using Musical.ly. Hence, my research focused on how the new app was understood, used, and appropriated by early adopters at the time of its emergence and uptake.

To gain a broader understanding of the context in which Musical.ly emerged and was negotiated and appropriated by its users, qualitative interview data was complemented with an analysis of Musical.ly's platform context. This included examining and documenting new features as they were introduced as well as the app's terms of service and public announcements. Additionally, the analysis also included reviewing news reporting and public commentary on the app as well as content analysis of popular trends on Musical.ly and later TikTok.

Framework: Social Construction of Technology

Understanding the complex relationship between technology and society has long been the focus of social scientists. Consequently, many interpretations emerged, varying in the degree of agency attributed to technology and user practices. Understood as the opposite of technological determinism, the social construction of technology can then be regarded as technological constructivism.

Pinch and Bijker (1984) introduced the *social construction of technology* (SCoT) as a framework for studying and analyzing the development of new technology. According to them, technology and its users affect each other while at the same time being affected by the specific social and cultural context in which the technology emerges and is being used. In other words, SCoT highlights that technology is created in response to the social and cultural context while it is also subject to the (ongoing) negotiations among creators, users, and nonusers over its purpose and design (Bijker, 1995; Humphreys, 2005; van Dijck, 2011; Wajcman & MacKenzie, 1999).

Although initially developed for consideration of users as relevant social actors for the construction of tangible technological artifacts (i.e., the bicycle), SCoT gained new momentum in the so-called Web 2.0 era. In the context of participatory Web 2.0, users are commonly seen as not only passive consumers but also as prosumers (Ritzer & Jurgenson, 2010; Tapscott, 1995), with an active role in media content production (Andrejevic, 2004; Jenkins, 2006). More recently, social constructivists' perspectives were used to analyze social media such as Twitter (van Dijck, 2011) as well as geomeia apps such as Yelp and Foursquare (Fast, Ljungberg, & Braunerhielm, 2019; Frith & Wilken, 2019; Wilken & Humphreys, 2019).

Pinch and Bijker's (1984) social construction of technology framework consists of five concepts or stages: (1) relevant social groups, (2) problems and conflicts, (3) interpretative flexibility, (4) design flexibility, and (5) closure and stabilization. The first concept takes into consideration all groups that have an interest in the technology (i.e., creators, users, and importantly, nonusers). The second concept deals with divergent perceptions and usage patterns of relevant social groups, leading to problems and conflicts. The third concept is central to any analysis as it affects and defines other concepts within SCoT. Interpretive flexibility points to radically different perceptions of technology (i.e., one can assign different meanings to the technological artifact), and ultimately these shared, assigned meanings further define a particular relevant social group. The fourth concept conjectures that design is always negotiated among all relevant social groups, as opposed to being a unidirectional process from creators to users. Finally, the fifth concept suggests that, eventually, conflicts are resolved; a prevalent meaning is assigned despite the still existing, less popular interpretations; there is no longer a need to redesign features, and inherently stabilization and closure are achieved. However, new relevant social groups may emerge and destabilize the technology, reactivating any of the previous stages.

In this article, I will analyze the interplay among Musical.ly, its users, and nonusers, as well as the cultural and social context in which Musical.ly emerged using *relevant social groups*, *problem and conflict*, and *interpretative flexibility*. My analysis refers to Musical.ly's emergence and uptake period. This period is characterized by the first three SCoT stages as, at the time, users and nonusers were appropriating the app and assigning respective meanings to it. Hence, stabilization had not yet occurred during my data collection. What is more, at the time of my data analysis, the app was merged with TikTok, inevitably introducing new social groups and new meanings. This, however, is beyond the analysis presented in this article. In addition, my research did not include accessing documents about internal corporate design-making processes of Musical.ly's creators. Therefore, I could only discuss social practices of users and nonusers as a basis for informing feature design, without making conclusions about design flexibility.

As suggested by Pinch and Bijker (1984), to understand the construction of technology, one must first identify relevant social groups. They primarily include the technological artifact's creators, its users, but also nonusers (van Dijck, 2011). As the technology advances, new relevant groups might be identified that were not necessarily present when the technology emerged. In the context of this article, I will identify and discuss key social groups relevant for the construction of Musical.ly, and these include its creators (app designers and operators), users (preteens), and nonusers (parents and regulatory bodies).

Each relevant social group is defined by a shared set of interests and meanings attached to the artifact (Humphreys, 2005; Pinch & Bijker, 1984; van Dijck, 2011). Hence, the stakes each relevant social group has in the observed technology is seen as a one of the determinants of the said social group. Creators had an economic stake in Musical.ly, whereas preteens as users had a personal stake—how technology can improve their everyday life. Nonusers (i.e., parents and regulatory bodies) hold a social and moral stake—their opinions and judgements directly affect the use of technology.

Interpretations and meanings assigned to the technological artifact—as the second determinant—varies across social groups which is caused by what Pinch and Bijker (1984) termed "interpretative flexibility" (p. 409). In the context of Musical.ly (and later TikTok), relevant social groups—creators of the app, preteens

as users, parents as preteens' media use guardians, and, lately, regulatory bodies across the globe—had their unique perceptions of the app. Importantly, meanings assigned to the app by each group are often at odds with each other, potentially leading to problems and conflicts (Pinch & Bijker, 1984).

In the context of Musical.ly's uptake phase, however, interpretative flexibility was initially at the heart of conflict resolution for the parents and preteens in my sample. Such flexibility is possible only in the app's emergence phase (Pinch & Oudshoorn, 2003), whereas absence of it indicates the shift toward stabilization of the technology's design and rhetorical closure.

Although Musical.ly became more integrated into the daily lives of families with preteen children and access to the app may have been stabilized, user practices generated new concerns initially for parents, and later regulatory bodies as well. New relevant social groups were introduced and, hence, new meanings assigned to the app. Importantly, the app itself did not have a neutral role in the process. In fact, it actively shaped the way each group perceived it. Finally, I will also show how the meanings and purposes assigned to it have changed from its emergence to date—and are still changing.

Interpretative Flexibility Alleviates Family Tensions Around Social Media

Because of their sensitive age, preteens as a user demographic come with their own unique set of challenges for app designers. According to the U.S. Children's Online Privacy Protection Act—COPPA (1998), media companies are required to obtain parental consent before enrolling users under the age of 13 to their services. However, because of logistical issues in administering such a requirement, most social media apps opt to limit its services to users under 13 years through their Terms of Service (boyd et al., 2011). Yet relying only on users' self-disclosure and without any formal age verification in place, there is evidence of social media use by users under the age of 13 (boyd et al., 2011; Pangrazio & Cardozo-Gaibisso, 2020). Therefore, in the absence of effective enforcement of such legislation, it is ultimately up to the parents to govern their child's access to digital devices and social media apps.

This was the case for most families in my sample. Namely, before a child could download and use an app, first they had to get their parents' approval. For many parents, manually checking each app before children were allowed to use it was part of their regular parenting practice:

With the iPhone to get an app, you go through the app store and you have to have an account; to get an account you have to have a credit card, yes, that's right . . . I know that there was some reason why I had to be involved; and, you know, she certainly wouldn't do it otherwise [laughs], so I've got her set up on a family account; obviously I am not giving her my credit card. So, I have to, and she absolutely hates it, I have to approve everything that she gets. (Lucy, mother of 13-year-old Scarlett)

Therefore, even though they do not use the app, from the SCoT perspective, the parents are a relevant social group for Musical.ly. Specifically, parents as the gatekeepers of children's engagement with digital media were one of the key relevant social groups in the social construction of Musical.ly.

Influenced by emotion-laden and risk-emphasizing public commentary on children's online engagement (Zaman, Holloway, Green, Jaunzems, & Vanwynsberghe, 2020), parents tend to lack confidence in their children's ability to navigate the challenges associated with social media, often resorting to restrictive practices regarding children's use of such apps. These include either a complete ban of social media, or, if allowed, the child's use is subject to many rules and check-ups.

On the other hand, preteens' search for autonomy (Berger, 2007) is at odds with strict parental regulation. Namely, children of this age are primarily interested in using the smartphone to have fun and socialize with peers in adult-free spaces, but this is often hindered by the above-described safety concerns of their parents. Ultimately, it is the parents' perception of the app that determines whether they will allow their preteen child to use it. Hence, these differing interests around digital media cause tensions between parents and children.

As a mobile social media app rapidly gaining popularity among preteens, Musical.ly was inherently predetermined to be at the center of this conflict. Yet this did not happen. Musical.ly managed to alleviate parental concerns associated with social media by leveraging the fact that public discourse favors creativity-inciting activities.

Some studies support children's use of digital media and apps as a tool for creative activities (Dezuanni, Dooley, Gattenhof, & Knight, 2015; Marsh et al., 2018; Yelland, Gilbert, & Turner, 2014). What is more, creativity and play are seen as vital for children's cognitive development (Vygotsky, 2004). Importantly, previous research (Nansen et al., 2012) has shown that play is central to children's engagement with digital devices. Thus, emphasizing creativity-enabling features even has the potential to offset the perceived risks and downsides of an app. A case in point is Musical.ly's market positioning focusing on acceptable and preferred characteristics and consequently successfully appeasing parental concerns.

Both Musical.ly and later TikTok were portraying itself as the "world's largest creative platform" (Figure 1) on Apple's and Google's app store (Savic & Albury, 2019, para. 7) or as "a global community that thrives on creativity and expression" (Figure 2). While these descriptions do not explicitly deny networking features, they certainly put the app's utility features at the forefront. On one hand, this can be understood as marketing differentiation. On the other hand, it was also about capitalizing on the preteens' preference for sharing and connecting through creative content (Savic, 2020).

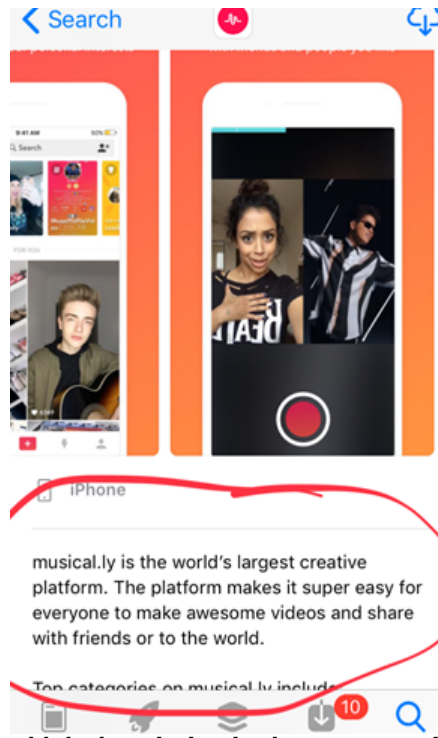


Figure 1. Musical.ly's description in the app store (May 2018).

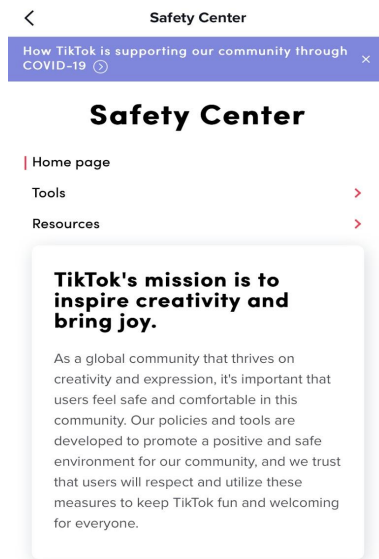


Figure 2. In-app screenshot of TikTok's mission statement (TikTok/Safety, 2020).

An interview with Emma, mother of 11-year-old Sophia, revealed that she and her husband had a strong grip over their daughter's engagement with social media. They were adamant to keep Sophia away from social media until she turned 13. Despite the restrictions for social media use, Sophia was allowed to download Musical.ly and create an account. Her mother explained it in the following way: "She is improvising or acting/playing to music. So that's what I understand of it. They just mime to music and they do lots of dance moves. They do that through the videos" (Emma, mother of 11-year-old Sophia).

Emma's perception of Musical.ly as primarily an app for entertainment and creative expression allowed her to overlook its networking features and permit her daughter to use the app.

Similarly, meanings assigned to the app by Erin's mother, Sienna, shaped how Musical.ly was socially constructed within their household. Sienna, who herself was not a proficient or enthusiastic user of technology, had great concerns over her daughter's use of social media.

So, I hate all the stress of this technology that you have to be connected all the time. . . .
And the more attractive the device is, the more time they spend on it. . . . She has Instagram; she has Musical.ly. I don't think you have friends there [on Musical.ly]—it's just like a game. And then she has WhatsApp and then the yellow one—Snapchat. (Sienna, mother of 13-year-old Erin)

Sienna explicitly restricted the use of certain services and limited interactions her daughter Erin was allowed to have on Instagram and Snapchat. Yet, due to the app's marketing efforts to present itself as a tool for creativity, Sienna did not see Erin's use of Musical.ly as an issue. Sienna's indifference and lack of explicit regulations then directly shaped how Erin saw it and used it—as an effective way to evade restrictions imposed on other social media apps. Recognizing that her mother sees Musical.ly differently to other social media apps shaped meanings associated with the app and the ways Erin engaged with it: "Uhm, with Instagram, parents think, 'Oh, that's not safe.' We shouldn't use Instagram. So yeah, more people use Musical.ly. That's why I have more fans/followers" (Erin, 13).

Concerned for her daughter Hayley's well-being, Emily believed she was still too young to engage with social media and lacked skills to safely do so. Emily's fear primarily revolved around her daughter falling prey to strangers online. Yet, while aware of the ability to connect with others through the app, it was not subject to such restrictions: "I think it's mainly for fun and games and mainly with the two girls here [neighbors]. To connect with them and then whatever friends they have and mainly for fun and especially for making music videos" (Emily, mother of 10-year-old Hayley).

In her own words, before allowing Hayley to use Musical.ly, Emily read the app's description on the app store and asked her daughter to explain to her what it was. Therefore, Emily allowed her daughter to install and use Musical.ly, completely unaware of its networking features: "I didn't realize that was social media [laughs]. I'm familiar with Instagram, but then, like with [Musical.ly], I had no idea what it was about; she's showing me videos and I didn't realize it was a social media [app]" (Emily, mother of 10-year-old Hayley).

Even in instances where parents were aware of Musical.ly's networking features, they still did not consider it important. The app's emphasis on creativity seemed to have appeased potential worries. This was the case with Hannah, who in fact was the one to introduce her 10-year-old daughter, Charlie, to the app:

It seems to be much more . . . minor for her interaction with the people, it's much more just sort of like "well I like that person's video" or their videos and it just sort of stops at that, there's no sort of further communication or anything. So that's what is more limited, I guess. (Hannah, mother of 10-year-old Charlie)

To sum up, because of interpretative flexibility of the app during its emergence, the thus-far identified relevant social groups—parents and preteens—had multidirectional influences on each other, but notably on the appropriation of technology, too. Appropriation of Musical.ly was, therefore, accompanied by much less tension compared with other social media apps available at the time. The wider implications of this are that the dynamic among users, nonusers, and technology effected a change in the parents' typical practices surrounding children and social media, which further affected children's social practices, as detailed in the next section.

The following section takes a more in-depth look at the ways Musical.ly was appropriated by its users under the influence of other relevant social groups (i.e., nonusers and app creators).

Musical.ly: An Adult-Free Space for Self-Expression and Peer Interaction?

Musical.ly's/TikTok's early features revolved around lip-syncing and dancing performances, allowing its users to create 15- to 60-second videos. From the very beginning, Musical.ly's culture revolved around humorous videos that would often gain momentum, inviting users to replicate them. Each video uses a music template as a background to which users would then lip-sync their performance. These videos also often involved dancing over the synced background music template.

In addition to the video-making features, the app also had all other communicative features typical for social media allowing users to connect with each other. Namely, users on the app could follow each other, although reciprocity was not required; like videos of others and comment on them; and privately communicate through the direct messaging feature. While Musical.ly's key feature was creating short videos, all other features closely resembled that of Instagram.

Although checking all the boxes of a social networking site (boyd & Ellison, 2007), Musical.ly still was not perceived as such. As a result, Musical.ly managed to satisfy the interests of both relevant social groups—parental concerns associated with child's social media use and preference for creative expression, while at the same time offering an adult-free space for peer interaction and entertainment to preteen users.

My auntie and uncle follow me on Instagram, so they know if I am doing something wrong, they'd tell my mom, but they don't use Musical.ly. . . . It [Musical.ly] is not too popular, but that's sort of what I like . . . just not a lot of people have it, and you can do it more just for you. (Phoebe, 12)

Although her parents were not using Instagram, Phoebe was aware of other significant adults there. Hence, she did not feel as comfortable exploring the app for self-expression knowing she was monitored. However, Musical.ly offered an adult-free space for both play and socializing.

Eleven-year-old Sophia also saw Musical.ly as different from other apps she was not allowed yet to use (i.e., Snapchat and Instagram):

Well it's not really social media but it's kind of allowing you to make funny videos. . . . It is called Musical.ly, and you kind of make small, like, I guess, little parts of music clips, and you can post them and stuff, but I have my account set to private and I do not talk to anyone I don't know there. (Sophia, 11)

Though Sophia saw Musical.ly as primarily an entertainment app, she was also very well aware of its networking features. However, she also realized that her parents saw it as different from other social media apps, and their restrictions did not apply there. She was aware of and using its communicative affordances to keep in touch with her peers, but appropriated creativity features to help mitigate parental restrictions. Similarly, for Hayley, Musical.ly was primarily about her interactions with several of her closest friends: "But Musical.ly is all about fun, like doing videos and having fun with it. We do Musical.ly together, we would make videos and post it online and stuff" (Hayley, 10).

Nonusers do not have a direct relationship with the technological object, but their ideas and attitudes toward it affect the social construction of technology. In the case of TikTok's predecessor Musical.ly, and particularly during its emergence phase, as nonusers, parents of preteens did not have a vested and direct interest in the app, but rather a moral one. As gatekeepers of children's media use, they contributed to the social construction of the app through their concerns and consequent decisions on the dos and don'ts of their child's engagement with the app. Parents' evaluations of the app directly influenced the ways users (their children) engaged with it.

[Mom] actually sometimes watches me do it, and she really loves me doing [Musical.ly] because she knows that I love singing and dancing and she thinks that it's good that I have an app that I can show everyone how I like to sing and how I like to dance and everything, yeah. (Charlie, 10)

Charlie's mother, Hannah, assigned positive values to Musical.ly and its perceived functionality. She valued creativity and saw the app as an enabler of her daughter's creative expression. While, at the time, Hannah was only a passive observer of her daughter's use of the app, the meanings she assigned to it enabled and even encouraged Charlie's engagement with the app.

From the SCoT perspective, users present one of the most important social groups for a technological artifact. During the emergence and early development phases of Musical.ly, preteens made up the core of its user base. Preteens as users had a direct connection with the app, and they were socially constructing it through their engagement practices. At the time of my data collection, all young people I

spoke to were relatively new to the app and therefore in the early days of exploring potential uses. At first, most of them were drawn to the app by its utility features for easy-to-use video production.

You just choose like the background and you just lip sync to it—it's just so easy to use. I love to sing and I love to dance, so Musical.ly is just fun because I can easily make cool videos of me. I make them almost every day. Okay, [whispers] don't tell mom this, but sometimes after I do my homework, I'd give myself a little treat and make one of those. I've completed my homework; I must make the video about it. (Charlie, 10)

In the beginning, preteens in my sample were not predominantly motivated by social networking functionalities to use the app. For Charlie, as it was for many of her peers as well, using Musical.ly was primarily a form of entertainment and digital play. Meanings she and her peers initially assigned to the app were all about performativity and creative expression. However, in time, their proficiency increased, and with it, meanings associated were reconstructed. Performativity and video making started being complemented with forms of "visual chitchat" (Villi, 2015, p. 10) with peers.

First, it was about messaging friends who did not use other messaging apps, but increasingly as Musical.ly and later TikTok became ingrained in Charlie's daily routine, she started to perceive it as a convenience. Instead of using multiple apps for multiple purposes (i.e., entertainment and communication), these purposes were merged into one: "It's just easier this way. I know that Miranda and Kerry are also doing videos on Musical.ly, and I just message them there; that's how we use it" (Charlie, 10).

Similarly, Sophia (11) was initially using it mainly for entertainment, but her awareness of its communicative features slowly affected her overall conceptualization of the app.

I use it to create videos, sometimes by myself or with my friends from school when they come over. I also use it to message them, as I am not allowed to use Snapchat. But I keep my account private and only talk to my friends. (Sophia, 11)

As seen from the above-included interview extracts, the ways in which young people as users appropriated the app, assigned meanings to it, and engaged with it were coconstructed equally by the app's features and market positioning, young people's experience of using it, but also parental (nonusers') perceptions and approaches to it.

In the following section, I will further explore how Musical.ly tailored its features to specifically appeal to this particular demographic—by replicating elements of teen cultures. While I did not have insights into corporate decision making around feature design, the following section will provide a brief analysis of the overlap between the app's features and user cultures, and in SCoT terms, further emphasize the importance of the interplay between technology and its users.

Social and Cultural Practices Inform Feature Design

In the app economy (Wilken, 2018), user bases present the most important asset of any social media app. However, attracting users is only the first step; the real challenge lies in their retention. Once they get to the platform, keeping their attention and incentivizing them to engage with the platform is what producers focus on. How did Musical.ly, and later TikTok, go about this?

My findings suggest that the app carefully tailored its features and functionalities toward specific interests of (at the time) its user base core—preteens. Observed through the SCoT prism, the features informed by users' interests and social practices represent the dynamic that takes place among all relevant social groups until a prevalent meaning is assigned to the technology (van Dijck, 2011). In other words, this section demonstrates how relevant social groups continually shape the technological artifact.

To better inform their product, Alex Zhu, one of Musical.ly's cofounders, admitted to observing who was using their platform and how (Savic, 2020). Zhu soon realized that preteens spend most of their time interacting with peers. Their online engagement is centered around music, performativity, and play, but in a social way. Such observations directed Musical.ly's focus on music, videos, and social networking. Namely, in addition to its easy-to-make video-making tools, Musical.ly's early features were designed to particularly appeal to the social and cultural practices of the preteen demographic.

In other words, users' social and cultural practices informed the app's design. For example, one of the first such features was BFF—"best fan forever"—allowing *musers* (at the time, Musical.ly users were popularly referred to as *musers*) to create duet videos. BFF feature allowed two users to link their accounts, which then enabled them to create individual videos with the same background music template; these two videos were then combined into a duet video. The BFF feature aimed to capitalize on the preteen's desire for peer interaction, while mimicking "Best Friends Forever"—a cultural construct representing best friends, often used among preteens and teens.

I love making videos with my friend Miranda. She is my BFF. So, when we are not together, we can still make videos, and Musical.ly puts them together. But I can do that only with her . . . with my other friends I can make Q&A videos. It is so much fun! (Charlie, 10)

In addition to the BFF feature, Musical.ly also had the Q&A (questions and answers) feature. Using Q&A to interact, one *muser* would pose a video question, while another *muser* provided a video answer. Musical.ly then combined the two videos into a 15-second clip. This feature was likely inspired by preteen cultural practices seen across other online platforms such as Ask.fm, YouTube, and others.

Following the merger of TikTok and Musical.ly, the Q&A feature disappeared, but the BFF feature was rebranded to a duet feature that is still one of the key TikTok's functionalities. "Duet" seems to be central to the virality of TikTok videos in line with TikTok's diversified user base, which now includes not only preteens but also teens and increasingly adults (Statista, 2020). Additionally, with the increased popularity of the app, celebrities and influencers from other platforms embraced TikTok as well. While Musical.ly's BFF feature required two accounts to be linked, the duet feature on TikTok is available to anyone

(unless the original content creator limits this option for their video). This feature is often seen to facilitate viral trends on the platform, as TikTokers make duets with popular videos in an effort to reach more views.

Therefore, the evolution of the BFF feature across Musical.ly and TikTok clearly depicts how users continue to shape the app's affordances, just as SCoT suggests—new relevant social groups emerge and destabilize the technology, which leads to the introduction of new or tweaking of old features.

Social Construction of Musical.ly Through Conflicts and Resolutions

As adults became more and more aware of Musical.ly, problems and conflicts surrounding usage practices arose. Understood in SCoT terms, problems and conflicts about the technological artifact are not constant, and often the dynamic among relevant social groups results in the redefinition of the problem (Humphreys, 2005). In the context of Musical.ly, this means that though interpretative flexibility may have aided parents and preteens in reaching stabilization in terms of app use, the problem of parental approval did not completely dissipate. Rather, it was redefined. As Musical.ly became integral to preteens' media engagement, the problems and conflicts moved from access to the issue of negotiating appropriate and/or dominant use of Musical.ly as a social media app. Just as this element of SCoT suggests, these problems and conflicts further shaped the app, user practices, and nonusers' perceptions and influences. Parents, as nonusers, took on a more active role, and as their concerns multiplied, a new relevant social group of nonusers was introduced—regulatory bodies.

As Emma explains below, she was concerned about her daughter using swear words and moves that may be perceived as overly sexual while replicating celebrity *musers'* moves. For instance, Baby Ariel was a top muser with a large following at the time (Savic, 2020), and her videos often involved lifting her top, dancing in a bikini, and similar moves.

There are particular songs that they can download which I don't like, 'cause there is swearing and stuff. And when they start to do the whole, I don't know who she is, like the artist, she's actually like lifting up her top, like she's doing like a little bikini sort of thing. . . . And her and her friends are doing that, so when they start to do things like that, that's part that I don't like. 'Cause some of the songs have swear words, that's the part that I go nuts about. They [Mario and Sophia] negotiated it in a way that she can only have friends on there that she knows, but now I know it's extended to some of her friend's friends and she is also following some people we don't know. (Emma, mother of 11-year-old Sophia)

Initially, Emma's (mis)interpretation of what the app actually affords led her to allow Sophia to use the app despite having a generally restrictive approach toward social media. However, new problems about the use further affected the way the app was socially constructed between them. In response to her concerns about the appropriateness of content as well as the communicative features of Musical.ly, Emma negotiated a new set of rules instructing her daughter how to use the app and what kind of content to post.

In addition to concerns around children's exposure to age-inappropriate content online, parents were also worried about the appropriate use of technology (McCosker, 2016) more generally. In the context

of parental concerns about children's online activity (boyd et al., 2011), appropriate use revolves around the issues of online safety and privacy (boyd & Hargittai, 2013; Sorbring, 2014). Concerned with their child being contacted or even groomed by strangers online, parents often see strict privacy controls as key to preventing harm.

I keep always repeating, don't accept whoever to be friends with you online. Always be private. . . . I told her, like, "Don't you dare put up some photos of the family, or your siblings, being naughty or whatever . . . don't you dare put it online." (Mila, mother of 12-year-old Phoebe)

Mila saw contact with strangers and posting potentially embarrassing content as two main issues with her daughter's online activity. As soon as she realized that Musical.ly indeed functioned as a social media, her efforts were directed toward reaching an agreement with Phoebe about appropriate use.

With the increased popularity of the app, the problem of children's safe interaction with Musical.ly extended beyond the household. Musical.ly attracted the attention of regulatory bodies as yet another nonuser relevant social group. As detailed below, regulatory bodies also had a specific interest in and perception of the app. In response to the newly emerged conflict, the app responded by introducing specific regulations, features, and resources to address these issues which further affected the process of the social construction of the app.

In November 2017, Chinese company ByteDance acquired Musical.ly. Following seamless integration and rebranding of Musical.ly as TikTok, during 2018 and 2019, TikTok caught the attention of various regulatory bodies across the markets it was operating in (Savic & Albury, 2019). For example, one of the most prominent rulings came in early 2019 when the U.S. Federal Trade Commission (FTC) ruled the highest fine ever imposed on a social media app for collecting and storing personal information of users under the age of 13 in violation of COPPA (Savic & Albury, 2019). Clearly, with its remarkable growth came public scrutiny, making public and regulatory bodies across the globe another relevant social group affecting the app.

In response to the ruling, but also broader public concerns increasingly associated with TikTok (Broderick, 2019; Burrows, 2020; Hinduja, 2016; Notopoulos, 2018; Waters, 2020), TikTok had to introduce several changes. As part of the settlement agreement with FTC, TikTok has split existing users into age-appropriate environments within the app (TikTok, 2019). To do so, TikTok introduced a self-administered age-verification process for the existing users. As a result, users who self-declared to be under the age of 13 were restricted to only watching content on the app, unable to share videos, comment, or message other users. However, as with other social media apps (boyd et al., 2011), age-verification was only implemented on a trust basis, meaning that many younger users were still able to access the full app if they provided a false age.

While the introduction of self-administered age-verification might be seen merely as an action to satisfy the FTC ruling, TikTok did not stop there. In April 2020, TikTok implemented another set of changes by restricting direct messages for users under the age of 16 (Smith Galer, 2020). Additionally, the app also introduced in-app tools to support parents in managing their child's engagement with the app—Family Pairing (see Figure 3).

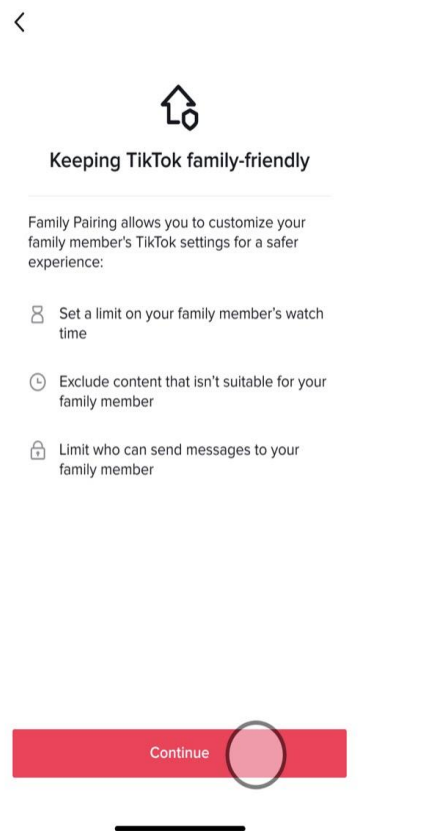


Figure 3. In-app screenshot of Family Pairing option available to parents (TikTok/Safety 2020).

The Family Pairing feature allows parents to link their child's and their TikTok account and in that way gain control over the "digital well-being" setting on the child's account. This includes control over screen-time management, direct messages, and restricted mode as options within the "digital well-being" suite. Once a parent and child pair their TikTok accounts, the parent can set time limits for the child's daily engagement with TikTok. Parents can also control a child's direct messaging feature either by completely disabling it or limiting who can message their child (e.g., only approved followers). Finally, restricted mode enables parents to enable content filtering and limit access to only age-appropriate content.

In response to growing concerns, TikTok also introduced a repository of resources for parents and young people. These resources (see Figure 4) are available under the section labelled "Safety Center" in the app's settings. Safety Center includes information on online safety, antibullying, digital well-being, parenting resources, and others (TikTok/safety, 2020). Interestingly, in SCOT terms, all these resources were introduced based on the dynamic between the app and nonusers, illustrating this relevant social group's considerable impact on the evolution of the app.

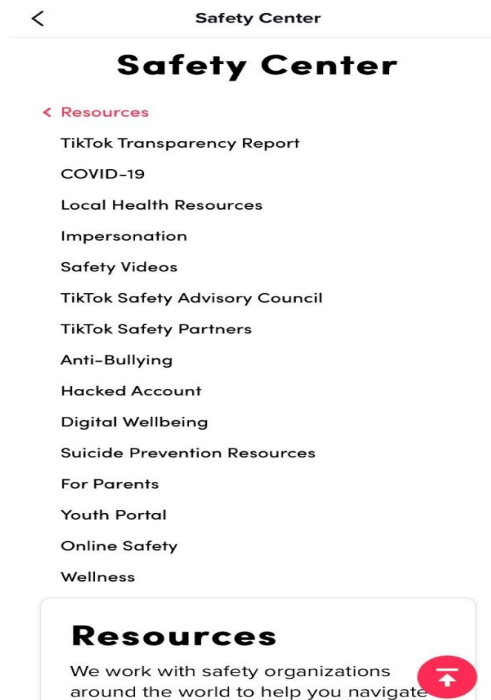


Figure 4. In-app screenshot of the resources available within TikTok's "Safety Center" (TikTok/Safety, 2020).

TikTok's in-app safety and well-being options are unprecedented and can be understood as a step in the right direction toward social media having a proactive role in supporting preteens' digital citizenship. However, the effectiveness of such measures is yet to be determined. For example, TikTok has not published metrics on the use and access to these features. Therefore, we do not currently know how many existing under-13 users were in fact restricted to the "age-appropriate app experience" (TikTok, 2019, para. 2) or how many families used the "family pairing" option.

As TikTok grows and becomes embedded in the daily social practices of a wider range of users, further research might look how such massification affects the app's positioning, feature design but also generates new cultural practices as we have seen previously with the maturing of other social media apps such as Flickr, YouTube, and Twitter (Burgess, 2015).

Conclusion

Amid a general shift toward visual communication and short videos in particular, Musical.ly, the predecessor of the app today known as TikTok, presents a unique success story. In its short existence, it went from 2014's obscure app, mostly used by preteens, to 2020's most downloaded app (Kaye, Chen, & Zeng, 2020). At a time when public discourse often portrays social media apps as an inevitability penetrating each pore of our daily lives with little or no agency assigned to the users, this article applies elements of

the social construction of technology theory (Pinch & Bijker, 1984) as an analytical tool to dismantle the agencies attributed to Musical.ly's various relevant social groups.

Emerging in a saturated social media market and recognizing preteens as its primary users with significant growth potential, Musical.ly carefully tailored its features to appeal to them. However, enrolling preteens requires going through their parents as gatekeepers of social media use. In the social context that did not encourage children's social media use but praised creativity and its role in children's cognitive development (Dezuanni et al., 2015; Marsh et al., 2018; Yelland et al., 2014), the app's creators tailored their marketing efforts to alleviate parental concerns. Hence, already from the outset, three relevant social groups—the app's creators, users and, nonusers—could be identified as active contributors to the social construction of Musical.ly, each led by its respective interests and meanings assigned to the app.

Musical.ly's initial design replicated elements of preteen cultures and focused on utility and visual performative elements of engagement. While parents saw it merely as a utility tool, their children gradually appropriated Musical.ly for both its entertainment and social networking features. Musical.ly itself, skillfully employed these diverging perceptions to appease the moral panic around youth's technology use. In turn, this aided the app's rapid uptake.

During Musical.ly's emergence, interpretative flexibility (Pinch & Bijker, 1984; van Dijck, 2011; i.e., varying meanings assigned to the app by users and nonusers), helped reconcile long-standing tensions around children and social media use. However, in time, parents became aware of some of the less desirable ways their children were engaging with the app. Age-old parental worries (boyd & Hargittai, 2013; Sorbring, 2014) around socializing with strangers and age-inappropriate content resurfaced. As a result, family rules surrounding the use of the Musical.ly/TikTok were renegotiated. However, these concerns were not confined to the household.

In 2018, Musical.ly, under new ownership and now rebranded as TikTok, attracted the attention, and inherently impact, of another relevant social group. Namely, regulatory bodies became concerned about data collection from underage users, resulting in record-setting fines for TikTok (Savic & Albury, 2019). In response, TikTok introduced a set of digital well-being and safety features affording parents more monitoring and restriction options—an unprecedented move by a social media platform, the effects of which are yet to be determined. Further research is needed to investigate the efficacy of such measures; the extent to which these resources indeed support family negotiations over online safety and digital well-being.

Using the SCoT framework, this article has demonstrated that social media apps (as well as other technologies) are subject to constant negotiations among various social groups within the specific social and cultural context. Challenging deterministic perspectives on technology, the social-constructivist approach recognizes users' but also nonusers' active roles in constructing meanings attached to technology. This interplay among the app, users, and nonusers then shapes social practices, but also indirectly impacts the design and introduction of the app's features, too.

This study contributes to the sociocultural understanding of the power dynamics among relevant social groups at the time of an app's emergence. While the coshaping of the technology may seem like a

collective effort among the app, users, and nonusers, it actually happens through contesting and (re)negotiating meanings assigned to it. As evidenced by research into other platforms (Burgess, 2015), in a broader sense, the dynamic between technology and users is the driver of innovation in social and cultural practices, as well as social media.

As seen from the changes the app has undergone in response to the mercurial public perception of social media and attitude of regulatory bodies, it is evident that a technological artifact is inseparable from the social context in which it emerges. Users are, thus, not presented with a final product when an app is released. Rather, the apps are being socially coconstructed at the intersection of dynamics and relationships among many relevant social groups, including app developers and operators, users, and nonusers. As such, the social construction of technology offers a framework to understand nuanced causality between society and technology—leaving the burden of responsibility for technology's effects on society to hover somewhere halfway between the apps and their users.

References

- Andrejevic, M. (2004). *Reality TV: The work of being watched*. Lanham, MD: Rowman & Littlefield.
- Bamberg, M. (2005). Narrative discourse and identities. In J. C. Meister, T. Kindt, & W. Schernus (Eds.), *Narratology beyond literary criticism mediality, disciplinarity* (pp. 213–237). Berlin, Germany: Walter de Gruyter.
- Berger, K. S. (2007). *The developing person through the lifespan* (7th ed.). New York, NY: Worth.
- Bijker, W. E. (1995). *Of bicycles, bakelites, and bulbs: Toward a theory of sociotechnical change*. Cambridge, MA: MIT Press.
- boyd, d., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210–230. doi:10.1111/j.1083-6101.2007.00393.x
- boyd, d., & Hargittai, E. (2013). Connected and concerned: Variation in parents' online safety concerns. *Policy & Internet*, 5(3), 245–269. doi:10.1002/1944-2866.POI332
- boyd, d., Hargittai, E., Schultz, J., & Palfrey, J. (2011). Why parents help their children lie to Facebook about age: Unintended consequences of the "Children's Online Privacy Protection Act." *First Monday*, 16(11). doi:10.5210/fm.v16i11.3850
- Broderick, R. (2019, June). *TikTok has a predator problem. A network of young women is fighting back*. Retrieved from <https://www.buzzfeednews.com/article/ryanhatesthis/tiktok-has-a-predator-problem-young-women-are-fighting-back>

- Burgess, J. (2015). From "broadcast yourself" to "follow your interests": Making over social media. *International Journal of Cultural Studies*, 18(3), 281–285. doi:10.1177/1367877913513684
- Burrows, T. (2020, July). Tik-ing time bomb. TikTok perverts "given one-week suspension for grooming children" on app. *The Sun*. Retrieved from <https://www.thesun.co.uk/news/12169172/tiktok-perverts-given-one-week-suspension-grooming-children/>
- Children's Online Privacy Protection Act §§ 15 U.S.C. §§ 6501-6506 (1998).
- Dezuanni, M., Dooley, K., Gattenhof, S., & Knight, L. (2015). *iPads in the early years: Developing literacy and creativity*. London, UK: Routledge.
- Dijck, J. van. (2011). Tracing Twitter: The rise of a microblogging platform. *International Journal of Media and Cultural Politics*, 7(3), 333–348. doi:10.1386/macp.7.3.333_1
- Fast, K., Ljungberg, E., & Braunerhielm, L. (2019). On the social construction of geomeia technologies. *Communication and the Public*, 4(2), 89–99. doi:10.1177/2057047319853049
- Frith, J., & Wilken, R. (2019). Social shaping of mobile geomeia services: An analysis of Yelp and Foursquare. *Communication and the Public*, 4(2), 133–149. doi:10.1177/2057047319850200
- Hinduja, S. (2016). *What you need to know about Musical.ly*. Retrieved from <https://cyberbullying.org/what-is-musically-app>
- Humphreys, L. (2005). Reframing social groups, closure, and stabilization in the social construction of technology. *Social Epistemology*, 19(2/3), 231–253. doi:10.1080/02691720500145449
- Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. New York: New York University Press.
- Jørgensen, K. M. (2016). The media go-along: Researching mobilities with media at hand. *MedieKultur: Journal of Media and Communication Research*, 32(60), 87–96. doi:10.7146/mediekultur.v32i60.22429
- Kaye, D. B. V., Chen, X., & Zeng, J. (2020). The co-evolution of two Chinese mobile short video apps: Parallel platformization of Douyin and TikTok. *Mobile Media & Communication*. doi:10.1177/2050157920952120
- Leaver, T. (2017, December). Facebook hoping Messenger Kids will draw future users, and their data. *ABC News*. Retrieved from <http://www.abc.net.au/news/2017-12-28/messenger-kids-is-facebooks-strategy-video-messeging-app-google/9285530>

- Light, B., Burgess, J., & Duguay, S. (2018). The walkthrough method: An approach to the study of apps. *New Media & Society, 20*(3), 881–900. doi:10.1177/1461444816675438
- Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J., Lahmar, J., & Scott, F. (2018). Play and creativity in young children's use of apps. *British Journal of Educational Technology, 49*(5), 870–882. doi:10.1111/bjet.12622
- McCosker, A. (2016). Managing cyberbullying: The three layers of control in digital citizenship. In A. McCosker, S. Vivienne, & A. Johns (Eds.), *Negotiating digital citizenship: Control, contest and culture* (pp. 21–40). London, UK: Rowman & Littlefield.
- Nansen, B., Chakraborty, K., Gibbs, L., MacDougall, C., & Vetere, F. (2012). Children and digital wellbeing in Australia: Online regulation, conduct, and competence. *Journal of Children and Media, 6*(2), 237–254. doi:10.1080/17482798.2011.619548
- Notopoulos, K. (2018, March). *Musical.ly is struggling to deal with self-harm content*. Retrieved from <https://www.buzzfeednews.com/article/katienotopoulos/musically-blocked-tags-related-to-self-harm-and-eating>
- Pangrazio, L., & Cardozo-Gaibisso, L. (2020). Beyond cybersafety: The need to develop social media literacies in pre-teens. *Digital Education Review, 37*, 49–63. doi:10.1344/der.2020.37.49-63
- Pinch, T. J., & Bijker, W. E. (1984). The social construction of facts and artifacts: Or how the sociology of science and the sociology of technology might benefit each other. *Social Studies of Science, 14*(3), 399–441. doi:10.1177/030631284014003004
- Pinch, T. J., & Oudshoorn, N. (2003). *How users matter: The co-construction of users and technologies*: Cambridge, MA: MIT Press.
- Rettberg, J. W. (2017). Hand signs for lip-syncing: The emergence of a gestural language on Musical.ly as a video-based equivalent to emoji. *Social Media + Society, 3*(4), 1–11. doi:10.1177/2056305117735751
- Ritzer, G., & Jurgenson, N. (2010). Production, consumption, prosumption: The nature of capitalism in the age of the digital "prosumer." *Journal of Consumer Culture, 10*(1), 13–36. doi:10.1177/1469540509354673
- Robards, B., & Lincoln, S. (2017). Uncovering longitudinal life narratives: Scrolling back on Facebook. *Qualitative Research, 17*(6), 715–730. doi:10.1177/1468794117700707
- Savic, M. (2020). *Negotiating family media practices: Parents, children and digital devices* (Doctoral dissertation). Swinburne University of Technology, Melbourne, Australia. Retrieved from <https://researchbank.swinburne.edu.au/items/cefa1daa-21b0-4497-8116-5f8272f076eb/1/>

- Savic, M., & Albury, K. (2019, July). *Most adults have never heard of TikTok. That's by design*. Retrieved from <https://theconversation.com/most-adults-have-never-heard-of-tiktok-thats-by-design-119815>
- Smith Galer, S. (2020). TikTok bans under-16s from private messaging. *BBC News*. Retrieved from <https://www.bbc.com/news/technology-52310529>
- Sorbring, E. (2014). Parents' concerns about their teenage children's Internet use. *Journal of Family Issues, 35*(1), 75–96. doi:10.1177/0192513x12467754
- Statista. (2020). *Distribution of TikTok users in the United States as of January 2020, by age group*. Retrieved from <https://www.statista.com/statistics/1095186/tiktok-us-users-age/>
- Tapscott, D. (1995). *The digital economy: Promise and peril in the age of networked intelligence*. New York, NY: McGraw-Hill.
- TikTok. (2019). *Musical.ly's agreement with FTC*. Retrieved from <https://newsroom.tiktok.com/en-us/musical-lys-agreement-with-ftc/>
- TikTok/Safety. (2020). *Safety center*. Retrieved from <https://www.tiktok.com/safety/>
- Villi, M. (2015). "Hey, I'm here right now": Camera phone photographs and mediated presence. *Photographies, 8*(1), 1–19. doi:10.1080/17540763.2014.968937
- Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russian & East European Psychology, 42*(1), 7–97. doi:10.1080/10610405.2004.11059210
- Wajcman, J., & MacKenzie, D. A. (1999). *The social shaping of technology* (2nd ed.). Buckingham, UK: Open University Press.
- Waters, C. (2020). Cyber bullying content targeting children pulled from TikTok. *The Sydney Morning Herald*. Retrieved from <https://www.smh.com.au/technology/cyber-bullying-content-targeting-children-pulled-from-tiktok-20200713-p55bjt.html>
- Wilken, R. (2018). Social media app economies. In J. Burgess, A. Marwick, & T. Poell (Eds.), *The Sage handbook of social media* (pp. 279–296). London, UK: SAGE Publications.
- Wilken, R., & Humphreys, L. (2019). Constructing the check-in: Reflections on photo-taking among Foursquare users. *Communication and the Public, 4*(2), 100–117. doi:10.1177/2057047319853328
- Yelland, N., Gilbert, C., & Turner, N. (2014). iPlay, iLearn, iGrow: Using iPads in a play-based kindergarten program. *Every Child, 20*(3), 14–15. <https://search.informit.org/doi/10.3316/informit.520615033559973>

Zaman, B., Holloway, D., Green, L., Jaunzems, K., & Vanwynsberghe, H. (2020). Opposing narratives about children's digital media use: A critical discourse analysis of online public advice given to parents in Australia and Belgium. *Media International Australia*, 176(1), 120–137.
doi:10.1177/1329878x20916950