

**A Care Ethics Analysis of the Architecture of the TikTok Application**

STS Research Paper  
Presented to the Faculty of the  
School of Engineering and Applied Science  
University of Virginia

By

Halle Wine

March 1, 2020

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: Halle Wine

Approved: Ben Laugelli Date May 3, 2020  
Benjamin J. Laugelli, Assistant Professor, Department of Engineering and Society

## **Introduction**

With more than one billion downloads across the world (Davis, 2019), TikTok has taken the social media world by storm. As a short video sharing application (app), people are using it as a form of expression and entertainment and are engaged with the app for hours at a time. Despite the rise of TikTok, not many scholars are talking about the addictive quality of the app and morality of the designers who created it. All that is currently considered is that TikTok uses data to discern user preferences and how that helps their business but not how this could be dangerous to its users. Without honing in how the developers of TikTok (ByteDance) intentionally created an addictive app, users do not understand that they are being taken advantage of and cannot see that the creators of TikTok purposely use them to make a profit. In neglecting this, they are also neglecting the question of whether the design of the app is moral or whether TikTok has gone too far in implementing addictive design strategies. I believe that by examining the architecture of TikTok I will be able to discern the choices that were made by the creators and therefore judge their morality based on care ethics. Drawing on care ethics, I argue that the developers are immoral because they failed to practice the four stages of care. Specifically, by taking a closer look at the four stages of care: attentiveness, responsibility, competence, and responsiveness, I will be able to discern the morality of the developers by looking at what stages they demonstrated proper care and which they did not.

## **Background**

TikTok (Douyin in China) is a short video sharing application(app) that was founded in China and has expanded around the world. In late 2019, TikTok had over 176 million downloads (Business of Apps, 2020), was the second most downloaded Android app worldwide(Priori Data, 2020a) and the fifth most downloaded app worldwide from the Apple store (Priori Data, 2020b).

The architecture and algorithm of the app allowed it to grow; users are able to upload and browse millions of videos that are recommended to them based on an algorithm that learns individual preferences. The algorithm is able to quickly learn users' preferences based on the users "likes", comments, and how long they watch each video (Davis, 2019). This keeps the users engaged and entices them to keep coming back to the app, attributing to the overall success.

## **Literature Review**

Due to TikTok's recent development, there is little research analyzing the application. In what does exist, the analyses focus on the exponential growth of the platform. This includes analysis of TikTok's business model, artificial intelligence software, and algorithm. These works fail to analyze the moral and ethical actions of the designers and instead focus on the ways in which TikTok growth can be applied to other applications.

In *The TikTok Strategy: Using AI Platforms to Take Over the World*, Jason Davis discusses the growth of TikTok and attributes its success to the algorithm the developers created. This algorithm captures not only the users "likes" and comments, but also how long the user watches each video. He also talks about other attributes that account for the popularity such as the ease of editing videos, suggesting music, hashtags, filters, and other enhancements that are trending or have been proven popular based on the category. All of these features allow for users and content creators to create viral videos and gain a following online. Davis also briefly mentions the addictiveness of the app: he argues that the "algorithm is so effective that experts have cautioned against TikTok addictions" as the average user spends 52 minutes per day on the app, equaling more than 200 videos and ads. Davis states that users join for a highly personalized stream of content that they find addictive and hard to stop. While he does mention addictiveness,

he barely scratches the surface and fails to consider the moral implications of the choices made by the designers and developers (Davis, 2019).

In *Analysis of ByteDance with a close look on Douyin/TikTok*, Xiaoye Shi takes a closer look at TikTok, known as Douyin in China, which has grown astronomically. Shi considers TikTok's historical growth and revenue model and is able to look at future growth that is predicted. He takes a look at different growth scenarios and tries to figure out what makes TikTok similar to and different from other applications in this genre and how to keep up with those other applications. However, there is really no mention of the ethical concerns behind the app, only analysis of how the application is doing and where it will go in the future (Shi, 2018).

In *Exploring short-form video application addiction: Socio-technical and attachment perspectives* by Xing Zhang You Wu, and Shan Liu, the authors examine factors that affect short video application addiction. Through questionnaires, they were able to see that social interaction anxiety and social isolation were positively related to interpersonal attachment and that entertainment and personalization were related to application attachment. The authors believe that these attributes lead to excessive use and addiction to these applications (Liu, Wu, & Zhang, 2019)

Though these articles are useful in gaining a better understanding into the application and its growth, they do not address the moral and ethical dimensions of TikTok, its architecture, and its designers. This paper will not only provide an analysis of the architecture of TikTok but will also assess the morality of the actions of the designers and developers with use of a care ethics framework.

### **Conceptual Framework**

The morality of the designers and developers of TikTok can be analyzed using a care ethics framework. Care ethics is an ethical theory that emphasizes the importance of relationships instead of upholding the theory that morals are developed through learning general moral principles. Lambér Royakkers and Ibo van de Poel explain that in care ethics, the connections between people are key and that people impact an actor's moral decisions (van de Poel & Royakkers, 2011). To be caring is to intuitively possess a certain kind of character that allows people to grow and lead mentally and emotionally healthy lives. This could be done through caring for the self and others (Steyl, 2019). Care ethics approaches morality in terms of relationships and context-based decisions (Burton & Dunn, 2017). Nel Nodding believes caring relations are ethically basic and in order to be moral one must maintain one's self as caring (Nodding, 1984).

Looking at care through the lens of virtue ethics, it would fall between the two extremes of irresponsibility, the failure to attend to user's needs, and abuse of power. These extremes are connected to Joan Tronto's four sub-elements of care: attentiveness, responsibility, competence and responsiveness (Sander-Staudt, n.d.). Tronto believed that these elements could be used to further understand the stages of care in relationships. Attentiveness is defined as becoming aware of a need and taking care of the need and responding to it is showing responsibility. Competence is providing good and successful care and actually meeting the person's needs. Finally, responsiveness is considering the position of the other in the relationship, the power dynamics that might exist, and setting boundaries to protect the other from abuse of power.

In the following section I will use care ethics and Tronto's four sub-elements to analyze the morality of the designers and developers of TikTok based on the architecture of the app and decisions that were made creating it.

## **Analysis**

TikTok's architecture has many features that display a lack of concern by the designers/developers of the app. The absence of care paints the actors, ByteDance, as immoral due to their relationship with users. ByteDance forms a connection and relationship with people once they begin using TikTok. Owing a duty of care to those we are connected to and having a direct concern for the good of another is the meaning behind care (Thomas, 2011). ByteDance neglected its users and displayed a lack of care. Due to their violation of care, the creators of TikTok are seen as morally irresponsible. In the following paragraphs, I will lay out how care is violated by examining the four moral concepts that constitute care: attentiveness, responsibility, competence and responsiveness (Sander-Staudt, n.d.). Using these concepts, I will detail certain aspects of the application's architecture/algorithm. These decisions by ByteDance highlight the absence of care in discerning choices that were made by the designers so that I may demonstrate how the actors acted immorally.

### *Attentiveness and Responsibility*

TikTok creators demonstrated adequate care in attentiveness and responsibility, but failed to do so in competence and responsiveness. ByteDance saw a need for a new type of short video sharing and editing application to replace the once widely used Vine. In its early years, Vine (an application) already had forty million registers and five vines (the name for the short videos produced) were being shared on other social media platforms such as Twitter every second (Richter, 2014). After the beloved app was taken down in 2017, ex-users took to other social media platforms to talk about how much they missed the app and wanted it to come back. Even years after the end of the application, vines are still being shared and watched and many YouTube videos are made with compilations of popular vines so people can still watch them.

ByteDance was attentive and saw the need for something similar to Vine and succeeded in creating a similar, but improved, version of the app that provided entertainment and the chance for creativity to be unleashed by its users. Ethan Bresnick states “Users can imagine a story and act out their scene in a make-believe environment. This video creation app is an escape from reality, an environment where users play dress-up from a selection of template effects” (Bresnick, 2019). Bresnick explains that TikTok could be used as a creative outlet in a different way than other social media websites and applications. In creating this app, ByteDance gave former Vine users a new platform to share original content on while also exposing its creative entertainment format to new users.

### *Competence and Responsiveness*

However, despite their attentiveness and responsibility for creating an app that would fulfill the user’s wants and needs, the creators were not competent. In fact, there are several aspects and features of the architecture of the application that have adverse effects on users. The first issue is one of privacy. As mentioned earlier, the creators developed an algorithm that takes the consumer’s data and uses it to craft highly targeted content. Putting emphasis on learning as much as they can about users, ByteDance established its own artificial intelligence (AI) lab that focuses on using machine learning and deep learning in its products (Shi,2019). This content not only includes short videos that might interest the user, but also ads and deals. Xing Lu and Zhicong Lu explain that users were shown very relevant ads that made them concerned about how well the app knew them (Lu & Lu,2019). By developing their own algorithm, ByteDance manages to collect user data unbeknownst to the user. The creators can (and do) use this data to sell advertisements and keep the users on the application for hours on end. This demonstrates improper care by ByteDance putting its own needs before the users by seducing users to stay on

the app longer than they might have wanted to and by including ads which is not why the users came to the app. By showing users highly relevant ads and content, ByteDance makes the users uncomfortable and concerned about their privacy. This highly personalized content makes the application very addictive to users, which is the next area of concern surrounding TikTok.

In a digital age, addiction to social media is a growing concern. Psychologist Richard Freed states that “kids are so taken with their phones and technology that they have turned their backs to the world around them” (Freed, 2018). Freed highlights that the addictive nature of social media leads kids to ignore reality leading to isolating themselves from family and friends. In the early stages of the app, popular “influencers” like Internet personality Loren Gray were hired to promote TikTok, and ads were placed on other social media apps that are used by a young population. ByteDance knew who its target audience would be and used its knowledge about social media to entice potential users to downloading TikTok. Like TikTok, many apps use experts in the field of psychology to play on the vulnerabilities of kids in order to maintain viewing time thereby increasing profits (Freed, 2018). In the creation of their algorithm and architecture of the app, ByteDance used knowledge of the human psyche in order to capitalize on vulnerabilities to make a profit (Kumar, 2019). Because of this addiction, teenagers, still developing and highly susceptible, are negatively impacted from TikTok. Users reported feeling hopeless about real life as they were intensively using the app: “Some interviewees reported that some videos on Douyin [i.e. TikTok] were so negative for emotions, that they made them hopeless about real life, and even brought contagion of negative emotions within friends” (Lu & Lu, 2019). From this, Lu and Lu demonstrate how negatively TikTok affects its users and how much of an impact it has on emotions. The negative emotions the interviewees were feeling are attributed to seeing others’ lives and comparing it to their own. Additionally, because TikTok is



a social app and friends often share videos with each other, the negative emotion spreads from not only one person, but to their friends. This shows how despite the adverse effects it has on users, ByteDance continues to foster an addictive atmosphere. User addiction to TikTok makes it hard to stop watching the videos recommended for them and this leads to seeing videos that can make them feel negative emotions.

Additionally, because TikTok is very popular, friends often talk about and share what they see, including videos that induce negative emotions. Many technologies bring teens and children into toxic and negative digital environments early on as they spend their time watching people have a good time, making them question the quality of their lives (Freed, 2018). Many videos on the app provide a peek into creators' lives and allow users to make unhealthy comparisons to their own lives, leading to user's viewing their own lives as sub-par. The creators failed to provide proper care for users and instead projected their own interests and goals onto the app. ByteDance took advantage of its power relationship with its users and used their innate vulnerabilities as humans to further its aspirations. ByteDance did not take into consideration their impact as a developer and the responsibility it had to those who would be affected by TikTok.

TikTok also created a new form of social literacy and a way to keep up with a trendy lifestyle. Many users, especially young users, report that they use TikTok to keep up with pop culture and be able to converse with people about trending topics or popular content (Lu & Lu, 2019). Awareness of what is happening or trending on TikTok is similar to speaking a different language: people only being in the know if they have the app. Because of this, people who don't use the app are excluded in real life: Lu and Lu (2019) found:

Over 90% of students in my class are using Douyin (TikTok). We often talk about interesting videos we saw on Douyin and even produce funny videos together. They often share the information of some fancy items they get to know about from some videos on Douyin ..., I cannot imagine what it will be like if I do not use Douyin. It would be like an outlier, I guess, that I could not understand what others are happily talking about. I use Douyin to keep up with the trend in my class. (pp. 6)

In order to keep up with current trends and feel like they are a part of conversations, users have to know what is happening on TikTok. This attributes to the addictiveness of the app because they need to be on it in order to see the popular videos that everyone is talking about or sharing: users don't want to miss out on what their friends are talking about or feel excluded. It has also been noted that those who do not use TikTok are often seen as "uncool and outdated" and discriminated against, adding to motivations for using TikTok in the first place (Lu & Lu, 2019). This leads to the question of power that TikTok is gaining. ByteDance has an extreme amount of influence on their users and non-users as they are starting to create divides in real life between those who use the app and those who do not. If the rapid and gross gain of power is not attended to and closely monitored, the risk will run high for neglect of care to their users as they are exhibiting an extreme amount of power.

Another interesting point to consider is the broader impact the creators have on unintended user groups such as young children. Despite TikTok's age requirement of twelve, young kids are still using the app without parental supervision. Children often lie about age, especially when age is restricting them from using popular applications that is defining young internet culture and internet culture in general. Young children are even fighting the age restriction on TikTok, claiming that it goes against their rights to prohibit them from a rapidly

growing app that is changing the digital and social landscape that they are a part of (Beutell, 2020). This demonstrates again the power of ByteDance. Even the unintended that they are trying to keep out, are fighting for access because of the cultural and social impact the app has. Even though they say they are not allowing young children to use the app, those non-intended users are still gaining access or fighting for access to technology that could negatively affect them. The creators failed to consider the impact that TikTok would have on a younger audience and neglected to show care to a growing population of the social media space that TikTok is a part of.

Here I have argued that TikTok is a harmful application that is hurting its users. However, some might argue that TikTok is just an application that was designed for its users to have fun and without harmful effects. In analyzing TikTok's architecture and the morality of the creators using care ethics, it is important to take into consideration viewpoints that do not see ByteDance as immoral. In *Intensified Play: Cinematic study of TikTok mobile app*, Ethan Bresnick argues that TikTok is not immoral and it doesn't warrant the moral panic that people are associating with it. Bresnick states that moral panic stems from parental concern and need for control over what occurs with their children and a misdirected notion that technology is unproductive for children. He states that TikTok is not like other social media apps that emphasize content consumption over production and it is more of a creative outlet for users (Bresnick, 2019). Bresnick claims "TikTok liberates young people to play without adhering to the visual styles, narratives, and online cultures of the past." However, the app's algorithm is formulated for the exact action that Bresnick states it is not, content consumption. The algorithm learns user's preferences and likes and based on those learned preferences, the algorithm then continuously recommends videos for them and continues to play them unless the user chooses to

exit out of the stream. This brings up issues of privacy and data collection, issues that Bresnick briefly mentions, but says is not specific to TikTok, but to all social media apps (Bresnick, 2019). However, TikTok directly uses data collection to provide curated content that keeps users on the application. In *Research on the Causes of the “Tik Tok” App Becoming Popular and the Existing Problems*, Li Xu states “The vibrating APP can accurately analyze the user's preference according to the user's like video type and the dwell time of a certain video, and then give the user a short video content of the tag type that the user likes, thereby increasing the user frequency” (Xu et. al., 2019). This disproves Bresnick’s point that TikTok specifically has no moral concerns and therefore, under care ethics “four stages of care”, the creators did not provide competence and responsiveness to the users by promoting an addiction to TikTok. They therefore violate care ethics and prove to be immoral.

## **Conclusion**

The morality of ByteDance as the developers of TikTok can be brought to light using care ethics to demonstrate how the creators showed an unethical lack of care to the users. Using Tronto’s four stages of care allow for an outlined and detailed look at what the creators specifically violated: competence and responsiveness. The violation of these sub-elements of care led to the extreme popularity of the app and the addictiveness that arose from it. It is important to consider the addictive quality of the application as users could be taken advantage of and negatively impacted due to this feature. By taking a look at the morality of the creators of the app and therefore TikTok itself, we can therefore decide when applications have gone too far in their design. This case study can provide a basis for holding designers and developers morally responsible to for their creations in an increasingly technology focused world.

## References

- Beutell, J. M. (2020). *Children's rights and social media: An analysis of TikTok's Terms of Service through the lens of a young user*. <https://www.ideals.illinois.edu/handle/2142/106069>
- Bresnick, E. (2019). Intensified Play: Cinematic study of TikTok mobile app. *Encyclopædia Britannica, Inc.* <https://www.britannica.com/topic/ethics-of-care>
- Davis, Jason. (2019, June 19). *The TikTok Strategy: Using AI Platforms to Take Over the World*.
- Dunn, C. P., & Burton, B. K. (2017, June 19). *Ethics of care | ethics and philosophy*. Encyclopedia Britannica. <https://www.britannica.com/topic/ethics-of-care>
- Freed, R. (2018). *The Tech Industry's War on Kids*.
- Global top iPhone apps by downloads 2019*. (n.d.). Statista. Retrieved February 13, 2020, from <https://www.statista.com/statistics/695791/top-iphone-apps-worldwide-by-number-of-downloads/>
- Jensen, T., & Vistisen, P. (2013). The ethics of user experience design discussed by the terms of apathy, sympathy, and empathy. *The Possibilities of Ethical ICT*, 242–246.
- Kumar, V. D. (2019). *Archives of Mental Health—Getting glued to TikTok® – Undermining the psychology behind widespread inclination toward dub-mashed videos: Download PDF*. <http://www.amhonline.org/downloadpdf.asp?issn=2589-9171;year=2019;volume=20;issue=2;spage=76;epage=77;aulast=Kumar;type=2>
- Lu, X., & Lu, Z. (2019). Fifteen Seconds of Fame: A Qualitative Study of Douyin, A Short Video Sharing Mobile Application in China. In G. Meiselwitz (Ed.), *Social Computing and Social Media. Design, Human Behavior and Analytics* (pp. 233–244). Springer International Publishing. [https://doi.org/10.1007/978-3-030-21902-4\\_17](https://doi.org/10.1007/978-3-030-21902-4_17)

- Noddings, N. (1984). *Caring, a Feminine Approach to Ethics & Moral Education*. University of California Press.
- Richter, F. (2014, July 14). *Infographic: Key Facts on Vine Usage*. Statista Infographics.  
<https://www.statista.com/chart/2456/key-facts-on-vine-usage/>
- Sander-Staudt, M. (n.d.). *Care Ethics* | *Internet Encyclopedia of Philosophy*. Retrieved February 19, 2020, from <https://www.iep.utm.edu/care-eth/#H2>
- Shi, X. (2018). Analysis of ByteDance with a close look on Douyin/TikTok. *Swiss Federal Institute of Technology Zurich (ETHZ)*. [https://ethz.ch/content/dam/ethz/special-interest/mtec/chair-of-entrepreneurial-risks-dam/documents/dissertation/master%20thesis/MasterThesis\\_Shi.pdf](https://ethz.ch/content/dam/ethz/special-interest/mtec/chair-of-entrepreneurial-risks-dam/documents/dissertation/master%20thesis/MasterThesis_Shi.pdf)
- Steyl, S. (2019). The Virtue of Care. *Hypatia-a Journal of Feminist Philosophy*, 34(3), 507–526.  
<https://doi.org/10.1111/hypa.12481>
- Thomas, A. (2011). Virtue Ethics and an Ethics of Care: Complementary or in Conflict? *Eidos*, 14, 132–151.
- TikTok quarterly first-time installs 2019*. (n.d.). Statista. Retrieved February 13, 2020, from <https://www.statista.com/statistics/1078692/china-tiktok-worldwide-downloads-quarterly/>
- Top Android apps by global downloads 2019*. (n.d.). Statista. Retrieved February 13, 2020, from <https://www.statista.com/statistics/693944/leading-android-apps-worldwide-by-downloads/>
- Tronto, J., & Holstein, M. (2001). An Ethic of Care. In *Ethics in Community-Based Elder Care*. Springer Publishing Company.
- van de Poel, I., & Royakkers, L. (2011). Normative Ethics. In *Ethics, Technology, and Engineering* (pp. 95–99). Wiley-Blackwell.
- Verbeek, P.-P. (2011). Designing Morality. In *Ethics, Technology, and Engineering: An Introduction* (1st ed., pp. 198–216).

Xu, L., Yan, X., & Zhang, Z. (2019). Research on the Causes of the “TikTok” App Becoming Popular and the Existing Problems. *Journal of Advanced Management Science*, 7(2), 59–63.

Zhang, X., Wu, Y., & Liu, S. (2019). Exploring short-form video application addiction: Socio-technical and attachment perspectives. *Telematics and Informatics*, 42, 101243.

<https://doi.org/10.1016/j.tele.2019.101243>