



# User-Generated Short Video Content in Social Media. A Case Study of TikTok

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**Abstract.** According to Alexa's ranking of the top 500 sites on the web, YouTube takes the second place, demonstrating the importance of online services focused on sharing of short self-shot videos. With growing popularity of mobile phones, mobile only short video sharing social media applications appeared on the market. One of such applications is TikTok, probably the most talked-of video sharing platform of 2019, similar to its twin service for the Chinese market, called Douyin. The content on YouTube varies greatly in topic: from music and toys to science and technologies, from computer games and cooking to education and politics. But does the content on mobile short video platforms differ that much too? The content of 1,000 videos on TikTok as a prominent representative of mobile short video sharing social media services was analyzed to find out which content is common and popular on TikTok. Content analysis was applied as the main research technique. Comedy videos and musical performances turned out to be the most popular and the most frequent categories among both male and female performers. Comedy videos are, however, especially frequent among male creators. At that, videos related to beauty and DIY are common for females, but not for males. Additional attention in this study was paid to the potential law infringements on the platform. The cases of potential violations of copyright and personal rights were observed. Videos containing inappropriate contents such as violence, sexual activity, or consumption of drugs and alcohol were, by contrast, not revealed.

**Keywords:** TikTok · Video sharing · Content analysis · Gender differences · Law infringements

## 1 Introduction

Video as a type of user-generated content online becomes more and more popular, which can be confirmed by the second place of YouTube among top websites worldwide, leaving behind among others the social networking site Facebook (#6), the knowledge base Wikipedia (#13), and the microblogging service Weibo (#16)<sup>1</sup>. Furthermore, on example of YouTube high rank the preference of short videos on a wider variety of topics created by ordinary (non-professional) users can be observed as the service also outperforms the traditional Video-on-Demand systems such as Netflix (#21 in Alexa's ranking as of February 2020). With that, YouTube is not the only one

<sup>1</sup> The top 500 sites on the web, [www.alexa.com/topsites](http://www.alexa.com/topsites).

representative of video sharing industry concentrated on user-generated contents, as the variety of such services is dramatically extending. Some platforms such as Vimeo concentrate on professionally generated contents. On social live streaming services (SLSSs), such as YouNow, Twitch, Periscope, people can broadcast their programs in real time and chat with each other during the stream [1]. With the growing importance of smart phones, video sharing applications available for mobile users only, i.e. Snapchat or Vine, appeared. The last ones are additionally characterized by ultra-short video length, varying from six seconds limit on the former Vine to 60 s limits on Snapchat. Attractiveness of videos of short content for users could be additionally evidenced in the subsequent extension of Instagram’s functionality with “stories.” Similar to the aforementioned services in the video length, but different in the functionality is the mobile video sharing social media application TikTok, probably the most talked-of video sharing platform of 2019.

“Make Your Day” states on the homepage of TikTok over funny creative user-created videos (see Fig. 1). Launched in August, 2017 by the Chinese technology company ByteDance [2], TikTok (#501 in Alexa’s ranking) became especially popular after merging with another short video sharing platform musical.ly [2, 3]. Both applications concentrate on production of short videos by their users. musical.ly, which emerged four years before TikTok, was famous with lip-synch effect, when users created videos with the help of the in-app synchronization functionality singing their favorite songs. However, as our study will further demonstrate, the content on TikTok is no more limited to lip-synch performances. Another particularity of TikTok is that it has a twin application in China which was launched by ByteDance even earlier than TikTok itself, namely in September, 2016, and is called Douyin (#12,930 in Alexa’s ranking) [2].



**Fig. 1.** Screenshot of some videos appearing on TikTok Homepage (TikTok Homepage, [www.tiktok.com](http://www.tiktok.com))

Recent rankings demonstrate that the application continues to win the popularity worldwide, being the most downloadable social media app in September, 2019 in both App and Play Stores [4]. Though the application is especially popular in Asian region, i.e., India, Indonesia, Malaysia [5] and a lot of people in China even “identify themselves as Douyiner” [6], recent statistics from Digiday indicate the user growth also in Europe with the largest market in Germany, where the number of monthly active users increased from 4.1 Million in January, 2019 to 5.5 Million in November, 2019 followed by the United Kingdom with the 5.4 Million in November, 2019 [7].

The main feature of TikTok is shooting and sharing short videos of 15 up to 60 s of any content except for “harassment or cyberbullying, harmful or dangerous content, nudity or sexual activity” [8], outlined as “don’ts” in the TikTok community guidelines. The application offers its users the functionality to apply numerous video and music filters and effects (e.g., photo templates, slow motion, bit rate sound, lip-sync, etc.) as well as to create special kinds of cooperative videos, i.e. duets and reactions [9]. A lot of videos appear as a reaction to the challenges launched by other users, TikTok itself or well-known brands and celebrities, who also start using TikTok for social media marketing campaigns. Along with functionality dedicated to the video production, the service provides functionality for networking, i.e. messaging, following other users, evaluation of videos with likes, shares and comments, which makes the application not only a video sharing platform, but additionally a social networking service. The use of application is also simple for users who use it for watching rather than for content creation and sharing. Similarly to Vine, which was characterized by users’ batch and passive view [10], users on TikTok are also exposed to a large amount of short videos that change each other with a simple screen scroll.

Generally, it can be concluded that TikTok is a comfortable place for its users where creativity and self-expression take leading positions. However, although being popular and frequently downloadable, on one hand, and promoting creativeness among its users, on the other hand, TikTok gained a very controversial fame in mass media, wherein the main critiques lay on problems around the young people, who are believed to be the majority of active users on TikTok. Inability to control the age of young to very young users by registration [11], child data use [12], copyright issues [13], cyber-bullying and cyber-grooming [14]. Unfortunately, all of those notions appear in the mass media in connection with the use of TikTok. Additionally, one special issue in Germany became videos of young sometimes lightly dressed girls, who are at the most risk of misuse by strangers because of such contents, even though those young girls do not tend to attract the opposite sex attention [15]. But is TikTok really that dangerous for its audience? Are the contents on TikTok inappropriate for younger users? With these questions in mind we undertook a case study applying content analysis to reveal what do the users of TikTok in Germany as the largest market in Europe create and like.

## 2 Background and Related Work

Social media applications such as Instagram and Vine “encourage the generation and consumption of user generated content (UGC) on a large scale” [16]. Studies confirm that younger users are more active in using Internet for social connections and

entertainment and younger age has “the predominant sociodemographic effect on content creation” [17]. The use of some video sharing platforms with limited built-in editing functionality, i.e. YouTube, is associated with some limitations, when it comes to the younger group of content creators. Although youth actively engage in video creation on YouTube, they mostly neither edit nor minimally cut their videos, as that requires familiarity with video editing and sometimes financial investments [18]. Thus, TikTok with its numerous free editing options allowing to perfect created content and all that with a few clicks on smart phone, which is practically always at hand, is potentially attractive for younger persons.

In spite of its popularity with impressive numbers of downloads and active users and also in spite of its constant appearance in the mass media even though in gloomy tones, a small number of research articles with the focus on TikTok is currently available, and those available are dedicated to Douyin or its predecessor musical.ly. With this study we contribute to research on mobile short video sharing social media applications taking TikTok as a prominent representative.

Searching for “TikTok”, “Douyin” and “musical.ly” in articles’ titles, abstracts, key words and topics, we found a total of twelve articles in Scopus and Web of Science. Three of those articles concentrated on modeling of micro-video recommendation services and mentioned TikTok as they took datasets from the platform for analysis. Two more articles were considered as irrelevant as they investigated a video-AI based visual destination image extraction method and reforms in online brand building in Chinese state-owned enterprises.

Another two articles concentrated on children’s safety, which is somewhat closer to our research as we investigate whether contents on TikTok are inappropriate for younger generation. Milkaite and Lievens [19] underlined that social media apps such as Instagram, Snapchat and TikTok, which are popular among children, have still not enough transparent and clear privacy policies and should enhance them applying “legal visualization, co-design, co-creation techniques and participatory design methods.” Badillo-Urquiola et al. [20] investigated children’s view on social media apps design taking TikTok as an example and found that children are interested in learning potential online dangers as well as in being able to mitigate online risks.

Furthermore, Rettberg [21] investigated video-based communication and suggested that hand signs largely used in lip-syncing videos on musical.ly “constitute a codified, non-verbal language of pictograms that is equivalent to emoji in text-based communication,” thus indirectly emphasizing the importance of lip-syncing videos for the application. Literat and Kligler-Vilenchik [22], however, added that the content on musical.ly diversified with times and the application had been even used for “youth collective political expression” during the 2016 US presidential elections.

Two more articles focused directly on Douyin and its characteristics. Chen et al. [23] investigated the “fundamental characteristics” (video length, video bitrate, and video size) of the application and the distribution of video’s popularity metrics (views, likes, shares, and comments) with the application for the cashing mechanisms. They confirmed that most of the videos (95%) do not exceed 15 s and that 65% of videos have the length of 14–16 s. In terms of popularity it was discovered that similarly to videos on other platforms Zipf’s law can be applied to the most popular videos in terms of views and likes on Douyin.

Lu and Lu [6] conducted a qualitative study of Douyin concentrating on user's motivations to use the application and challenges and concerns its users face. They found that people relax and have fun while they watch videos. Another important factor was socialization. Similar to the usage of SLSSs [1], people on Douyin like to communicate with others, find friends from strangers or appropriate communities and even engage into virtual intimate relationship with the creators, i.e. become involved in "parasocial interactions" [24]. However, some people watch videos in order not to be left out of conversations (i.e., not to be "discriminated") in offline everyday life. As to the challenges in application, users were not satisfied with the search functionality as well as with the recommendation system. Privacy issues, addiction and extreme use of the service for both sharing and watching videos were among main users' concerns.

Beyond the Douyiner's motivations, Lu and Lu's study [6] revealed the content categories the users engage in. In popular videos, performers often show fashionable items or cosmetics, demonstrate romantic behavior "narrating lover's prattle," or give practical recommendations to their fans in matters of "good-looking profile images" or "fancy nicknames." Although not being representative, the category "prosocial behaviour" of humans was named by the Douyiners as important due to its association with "positive energy." Additionally, the category of knowledge sharing was mentioned as category with videos of high production value. Among other "engaging" contents were categories dedicated to popular nature and social sciences, education (e.g., "learning notes about Maths"), arts and skills (calligraphy, dancing, painting, etc.), professional life, life hacks, tourism, as well as videos related to babies (e.g., "baby raising," "early education" or showing babies' "talents").

To sum up the existing literature on TikTok, the application was involved into the studies that concentrated on technical parameters of videos on sharing platforms, children's online safety, motives to use the service and content generated by users on Douyin and to some extent on the former musical.ly. With that, indication of such topics as knowledge sharing raises special interest to Douyin and TikTok, as in English and German mass media the use of short videos platforms like Vine, musical.ly, or TikTok itself is almost exclusively associated with funny, music, and dancing videos. Yarosh et al. [25] in their research on youth-authorship on Vine and YouTube also mention the categories related to fun and self-presentation as more typical for youth. Although a lot of short video content categories were named above, some of the categories common for video sharing services were not yet mentioned. Among them are pets and animals, news and politics, autos and vehicles, computer games [26–28], and toys [27]. Also sexy self-presentation of adolescents is no exception on social networking sites [29] and young people often have access to and can even appear in videos of inappropriate content, i.e. related to bullying, sexual behavior, drugs, etc. [30].

Another important point of social media services usage, yet not touched in research on short video applications, is gender differences. Despite that, some studies on SLSSs as well as on YouTube provide hints, that gender differences take place on short video sharing platforms. Thus, differences were indicated gender differences in practically all aspects of SLSSs usage, i.e. in content preferences, motivations to stream and to watch,

tendencies in law infringements, and perception of gamification elements [31]. A study on YouTube found that males differ from females in their participatory behavior. More precisely, males tend to dislike and comment more than females, whereas females are more exposed to sharing [32]. As to the sexy contents on SNSs in general, young girls tend to post themselves with a sexy appearance more often than males [29].

One more important aspect of studies on video sharing services, namely potential law infringements, also remained uncovered in the literature on TikTok, although previous research demonstrated that the use of video sharing platforms is often connected with violations related to copyright, personal rights, as well as inappropriate contents [33–35]. As TikTok is largely based on videos supported with music and Germany has one of the strictest copyright legislation, we checked whether potential copyright issues arise on TikTok in the light of German *Urheberrecht*. Another frequently observed law infringement is violation of personal rights [35]. In this study we analyzed whether TikTok creators film third parties without their evident permission. Taking into account that most of the TikTok users are believed to be underage persons, we additionally checked whether sexual or violent contents as well as videos showing drug or alcohol consumption (all of which cause harm to younger audience) are found on TikTok as it is the case on other video sharing services [35, 36].

In line with above literature review, the following research questions were formulated:

(RQ1) Which content post users on TikTok?

(RQ2) Are there gender differences among creators in the content preferences?

(RQ3) Videos of which content are the most popular on TikTok?

(RQ4) Do potential law infringements occur on TikTok?

At this point, it should be mentioned that this study refers to the videos originated from Germany. That is caused by the fact that one of the technical requirements of TikTok is setting up the country, when creating an account. We therefore had to limit our research to one country. However, since video sharing platforms are popular for a long time in Germany [37] and the chosen country has the highest number of TikTok users among other European countries, the study is viewed as representative.

### 3 Methods

Content analysis was used as the main research technique allowing researchers to achieve reliable and valid results by coding and, therefore, quantifying qualitative contents (i.e., texts, images, sounds, signs, etc.) [38, pp. 18–19]. The content analysis was conducted in five most common steps identified in literature by McMillan [39]. First, the research questions were formulated. After that as the second step of the content analysis, the sample was selected. Sampling frame consisted of 1,000 videos appearing on TikTok’s main feed (“for you page”), which randomly proposes videos to its users. As videos appearing on the main feed become customized depending on what

content had been already watched and liked, we additionally searched for videos using hashtags #foryou, #foryourpage, and #fürdich. Those hashtags are described as the most neutral ones and unlike many other hashtags are not restricted to any specific content, thus covering a wide range of video themes.

At the third step, the content categories were defined, which resulted in appearance of the codebook. In line with the RQ1 to identify the content categories on TikTok in general, the categories in this study were collected inductively. For that, a preliminary study of videos on TikTok was conducted. Each of the eight coders had to watch the videos on TikTok during two weeks and mark possible content categories. After that, the categories proposals from all coders were aggregated, sorted and extended with the descriptions, videos of which content should be assigned to a specific category. This resulted firstly in 26 content categories. The 27th category “Sexy/Flirting” was added to the codebook in view of the critique of the mass media around TikTok. Videos should be assigned to that category, when performers show off their bodies (i.e., scantily or skin-tight dressed or wear very short cloths) and/or perform or pose provocatively, which is in line with previous studies [29]. The content by itself does not show sexual scenes and cannot be viewed as inappropriate for underage users, but can draw attention of opposite sex, which in its turn can potentially lead to cyber-grooming. Finally, the 28th category “Not assignable” was added covering the contents that could not be assigned to any of the 27 categories. Beyond that, ten formal categories were defined to enable researchers to answer RQ2 to RQ4. They included a category of gender, five categories related to potential law infringements (copyright and personal right violations, demonstration of inappropriate contents such as violence, sexual activity, drugs or alcohol consumption). Four more formal categories covered statistics data, i.e. number of likes, shares, and comments to a video, and number of user’s followers, all of which served for evaluation of video popularity. Regarding the category of gender, it should be clarified that it referred to the gender of the performer depicted in the video, not to the user who shared the video, as no demographic data, including gender, is available in the user’s profile and relaying on the profile’s photo did not always provide evidence about user’s gender.

At this step, it was also important “to define the time period of the study” [39]. The research team decided to analyze the content on TikTok during two months from May 1, 2019 to June 30, 2019, thus ensuring wider range of video contents and increasing the representativeness of the study as new videos appear every day. The time period was divided into four parts, so that each group of two coders collected and coded the videos during two weeks.

The fourth step involved training coders and checking the reliability of their coding skills. The research team consisted of eight coders (master students at a German university) from which four groups of two coders each were created. To save the coding results, a Google spreadsheet with all content and formal categories included was created. Each coder had access to the document and had to put the results of his or her coding into the document. Each coder within the group had to code independently. For that, two TikTok accounts were created using which the coders could watch and



code videos. Each coder had to choose and analyze 125 videos and send them to the partner for parallel coding. That was ensured by sending the videos via direct messages. That way was additionally guaranteed that the coders worked with identical data. Totally, each group coded 250 videos and each video was coded twice. The binary coding was used, where “1” meant that a video belongs to a category and “0” – does not. The coders were allowed to assign a video to several categories. The observation that one video can combine different types of content was mentioned also in the previous research [25]. The formal categories were coded only by one of the coders, e.g. the coder who sent the video. To check the reliability of the cross-coding results, Krippendorff’s alpha was applied [38, p. 226]. As the values calculated for each group and for each category exceeded the reliability minimum of 0.8, the coding data were accepted as reliable [38, p. 241]. If disagreements occurred, the coding values were reviewed in groups to jointly meet the final decision on the coding value. In the final fifth step of the content analysis, the research team analyzed and interpreted the collected coding data.

## 4 Results

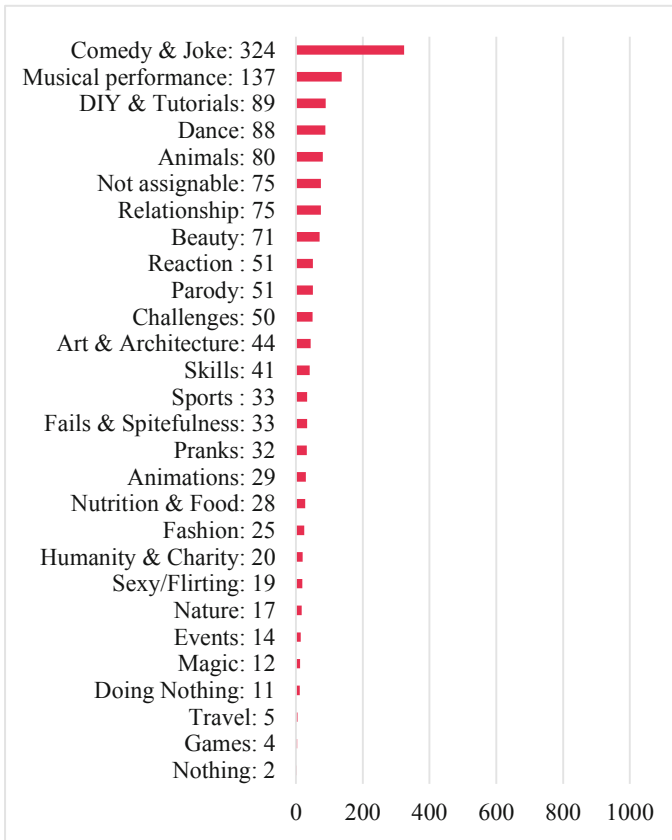
### 4.1 User-Generated Content on TikTok

In the frame of this content analysis, 1,000 videos on the mobile video sharing application TikTok were analyzed allowing to determine which contents appear on TikTok (RQ1). As it can be seen on Fig. 2, the highest number of videos (32.4%) belongs to the category “Comedy & Joke.” The second most frequently observed category with 137 videos is “Musical performance.” Further on, the categories “DIY & Tutorials” (89 videos) and “Dance” (88 videos) stand very close to each other taking the third and the fourth places, accordingly. With that, those two categories as well as all other categories individually amounted to less than 10%. Although in very small amount (0.02%), the videos showing no content in fact (“Nothing”) were also observed. The categories “Games” and “Travel” also appeared to be among the less frequent content categories. The much-talked-of category “Sexy/Flirting” occurred 19 times. In most of the videos of this category, the performers were skin-tight dressed and posed with a sexy gaze. In two videos, girls wore a swim suit only. At that, the contents were combined with musical performances or doing everyday things.

To reveal the differences in content preferences among male and female content creators (RQ2), the data about gender of video performers was collected. Generally, in a total of 405 videos female performers were observed; male persons performed in only 201 videos. Relatively frequently, i.e. in 240 videos, groups of two or more people were shot. In 154 videos no persons, but animals, nature, food, or other objects were presented.

The results on the frequency of content occurrence depending on the gender of the performer are present in the Table 1. It is remarkable that “Comedy/Joke” is the most frequent category among both female and male creators. However, the named category is especially frequent among males, as more than 40% of videos with male performers were assigned to that category as opposed to 29.63% by females. In addition to that,





**Fig. 2.** Distribution of content categories on TikTok by occurrence frequency (N = 1,000)

both genders seem to like to create the content referring to the categories “Musical performance” and “Dance.” Also relatively frequently among both genders are the videos where performers parody other people (mostly their relatives, i.e. parents or older/younger sisters/brothers, or teachers). Though rather rarely observed, the videos of the category “Pranks,” where the scenes of rather inappropriate behavior are shot, have remarkably comparable relative frequency among both genders. Not surprisingly, the categories “Beauty” and “DIY & Tutorials” are among the most frequent by females, but are rather rare by males. Next to comedies and musical performances, males in their turn prefer to generate the content showing their reaction to something, including other videos (“Reaction”), or taking up the challenges (“Challenges”). With that, the category “Relationship,” often showing persons from their romantic side, occurs more frequently among males than females. Remarkable is the distribution of videos in the category “Sexy/Flirting,” as girls appeared in 18 out of 19 videos. The prevalence of sexy self-presentation by female persons is, however, in line with previous studies [29].

To identify the categories which are the most popular among TikTok users (*RQ3*) we analyzed 100 videos with the highest numbers of likes, shares, and comments, respectively. Chen et al. [23] concluded that popularity metrics on Douyin are distributed by Zipf's law, which means that very view videos get the most of the likes and, vice versa, most of the videos get very few likes. Our analysis also confirmed such inhomogeneous distribution of popularity metrics. Thus, 100 out of 1,000 videos got 63.25% of all likes, 81.37% of all comments, and 76.73% of all shares. It was, therefore, sufficient to analyze only 100 most popular videos to reveal the most popular categories.

**Table 1.** Distribution of content categories on TikTok depending on the performer's gender

Category	Female performers			Male performers		
	Rank	Number of videos (N = 405)	Relative frequency	Rank	Number of videos (N = 201)	Relative frequency
Comedy/Joke	1	120	29.63%	1	88	43.78%
Musical Performance	2	69	17.04%	2	30	14.93%
Beauty	3	53	13.09%	11	6	2.99%
DIY & Tutorials	4	47	11.60%	11	6	2.99%
Dance	5	42	10.37%	4	15	7.46%
Not assignable	6	35	8.64%	6	11	5.47%
Parody	7	26	6.42%	5	13	6.47%
Sexy/Flirting	8	18	4.44%	14	1	0.50%
Challenges	8	17	4.20%	4	15	7.46%
Skills	9	17	4.20%	5	13	6.47%
Animals	10	16	3.95%	7	10	4.98%
Animations	11	15	3.70%	13	2	1.00%
Fashion	12	14	3.46%	11	6	2.99%
Relationship	12	13	3.21%	8	9	4.48%
Sports	12	13	3.21%	9	8	3.98%
Fails & Spitefulness	13	13	3.21%	10	7	3.48%
Pranks	13	9	2.22%	11	6	2.99%
Doing Nothing	14	9	2.22%	14	1	0.50%
Reaction	14	8	1.98%	3	18	8.96%
Art & Architecture	15	8	1.98%	11	6	2.99%
Nature	16	7	1.73%	12	3	1.49%
Events	17	6	1.48%	14	1	0.50%
Nutrition/Food	18	5	1.23%	6	11	5.47%
Magic	19	4	0.99%	12	3	1.49%
Humanity/Charity	19	3	0.74%	8	9	4.48%
Games	20	2	0.49%	14	1	0.50%
Travel	20	2	0.49%	14	1	0.50%
Nothing	–	0	–	14	1	0.50%

Generally, it can be observed that videos on TikTok main feed appear not only in case of their high popularity. On the contrary, the number of likes, shares, and comments to clips recommended for viewing by the system varied greatly from 0 to several billions (see Table 2). The results of correlation analysis are basically congruent with Chen et al.'s study [23], as correlations tend to be predominantly positive moderate. At that, the correlation between the number of likes and shares is positively high, signaling that the more likes collected a video, the more shares it gets. Thus, people tend to share videos that they liked. Further on, recipients of those videos will also most probably like the shared video. Close to that, is the highly moderate correlation between likes and comments: Users rather relatively leave their comments to videos they liked. Additionally, we analyzed whether the number of user's followers positively effects video popularity, as one can suggest, that the more followers a user has, the more likes, shares and comments collect his or her videos. That being said, the resulted low correlation with all metrics rather indicates the absence of such effect, meaning that the high number of followers contributes to the popularity of a video only to a low degree.

**Table 2.** Distribution of popularity metrics to the analyzed videos (N = 1,000) on TikTok and correlation between parameters

<i>Popularity metrics</i>	Likes	Comments	Shares	Followers
Maximum value	9,700,000	1,200,000	1,100,000	18,000,000
Minimum value	0	0	0	0
Median	109,450	942	2,000	78,200
<i>Correlations</i>				
Likes	1	.463**	.746**	.244**
Comments	.463**	1	.341**	.100**
Shares	.746**	.341**	1	.114**
Followers	.244**	.100**	.114**	1

\*\* : correlation is significant at the level of 0.01.

The top seven highly ranked, i.e. most popular, content categories can be found in the Tables 3a, 3b, and 3c. The ranks were assigned to categories depending on how many times a video of a specific category occurred in the top 100 videos.

The absolute winner by the number of likes, comments, and shares is the category "Comedy/Joke" followed by the categories "Musical performance" and "Art & Architecture." With that, remarkable is the high popularity of the category "Art & Architecture," as videos of this category unlike the above mentioned categories were not among the most frequently observed. Similar to that are the categories "Animals" and "Humanity/Charity." Opposite to that are the frequent categories "Beauty" and

“Parody,” which do not occur among most liked, commented, and shared videos with relative frequency of not less than 5%. All other popular categories were also among the frequently observed. With that, the categories which are typical for mostly liked videos, also appear in the ranking of mostly commented and mostly shared videos, being in line with the results of correlation analysis. Special attention was paid to the category “Sexy/Flirting,” which actually appeared among 100 most liked, commented, and shared videos, but only twice, triply, and twice, accordingly. Similar to that is the problematic category “Pranks,” which was three times highly liked and once highly shared, although it did not occur among the highly commented videos.

The further look into the distribution of popularity metrics, however, indicated that, although some categories were among most frequently observed, they did not obligatory get the highest number of likes, comments, or shares. In terms of likes, videos of the categories “Humanity/Charity,” “Fails & Spitefulness,” and “Challenges” got even more likes than “Comedy/Joke” and “Musical performance”. Similarly, videos of the categories “Relationship,” “Art & Architecture,” “Humanity/Charity,” and “Dance” appear to be more actively commented than the category “Comedy/Joke,” although being less frequent in the top 100 videos. As to the shares, the category “Comedy/Joke” keeps its leading positions in terms of both frequency and popularity. Outstanding are the categories “Relationship” and “Skills” with the lowest ranks, but practically highest numbers of shares.

**Table 3a.** Most popular content categories on TikTok depending on the number of likes

Rank	Category	Number of videos (n = 100)	Median: Number of likes
1	Comedy/Joke	33	2,300,000
2	Musical performance	14	2,200,000
	Art & Architecture	14	1,850,000
3	Dance	9	2,300,000
	Relationship	9	1,800,000
4	Animals	8	1,700,000
	Challenges	8	2,400,000
	Humanity/Charity	8	2,850,000
5	DIY & Tutorials	7	1,900,000
	Skills	7	2,000,000
6	Not assignable	6	2,300,000
7	Fails & Spitefulness	5	2,600,000

**Table 3b.** Most popular content categories on TikTok depending on the number of comments

Rank	Category	Number of videos (n = 100)	Median: Number of comments
1	Comedy/Joke	30	27,000
2	Art & Architecture	16	31,300
3	Musical performance	14	18,700
4	DIY & Tutorials	10	20,000
	Dance	10	29,150
5	Humanity/Charity	9	30,800
	Not assignable	9	15,200
6	Animals	7	25,400
	Challenges	7	16,500
	Animations	7	17,100
7	Relationship	6	42,400

**Table 3c.** Most popular content categories on TikTok depending on the number of shares

Rank	Category	Number of videos (n = 100)	Median: Number of shares
1	Comedy/Joke	32	2,200,000
2	Musical performance	17	54,350
3	Art & Architecture	14	46,650
4	Animals	11	48,700
	DIY & Tutorials	11	48,700
5	Dance	9	54,500
	Challenges	9	60,000
6	Relationship	8	101,750
7	Skills	6	83,200

## 4.2 Potential Law Infringements on TikTok

The analysis of collected data additionally confirmed that some potential law violations can be observed on TikTok (*RQ4*). The results are present in the Table 4. To find out whether the copyright violations take place on TikTok we first analyzed if music was playing in videos, which resulted in that 262 out of 1,000 videos, which were not supported with any music. In 304 out of the remaining 738 videos with music (i.e., in 30.4% of all videos), there were observed cases of copyright violations. The main reasons were the absence of a proper title to a played song or playback of songs from private collections in the background. However, it should be noted that such kinds of copyright violations are seen as potential law infringements in terms of very strict German legislation. At the same time, those cases could be treated as “fair use” in the USA. The personal rights violations were observed in 19 videos, most of them filming people in background. In one case, a teacher was the object of the video shot with a hidden mobile phone. As to inappropriate content, the analyzed videos do not show either violence or drug and alcohol consumption. The sexual content was also not found.

**Table 4.** Potential law infringements in videos on TikTok (N = 1,000)

Potential law infringement	Copyright	Personal rights	Inappropriate contents		
			Violence	Sexual	Drug or alcohol consumption
Number of videos	304	19	0	0	0

## 5 Discussion

In this study, 1,000 videos were analyzed to reveal which contents are common and popular on TikTok. The content analysis demonstrated that a few categories, i.e. “Comedy & Joke,” “Musical performance,” “DIY & Tutorials,” and “Dance,” stand out in terms of relative frequency, while numerous other categories take only small percentage of shares in the videos distribution. Especially prominent turned out to be videos where creators show comedic content. The category left behind musical videos, where people sing or dance, in terms of both frequency and popularity, although musical videos are also highly ranked.

With the category “Comedy” being on the top, TikTok is very similar to other video sharing platforms, including YouTube, YouNow, and Vine, each being representative of different types of video sharing applications. This result is also in line with the study on Douyin [6], stating that having fun is one of the most common user motives. Musical clips and creative dances along with beauty, fashion, relationships, prosocial behavior, life hacks, animals, food: All those categories have TikTok and Douyin in common. At the same time, videos oriented at political issues as well as travelling are rather exceptional on TikTok. Unlike Douyin, videos addressing educational needs as well as content related to the professional life did not occur on TikTok. Thus, categories related to knowledge sharing are not the specific for TikTok and are only partially present in the categories “DIY & Tutorials” and “Beauty,” which in turn can be characterized as entertaining. Also baby related videos on TikTok could be assigned to funny videos and not to educational content as it is the case on Douyin [6]. Beyond that, not typical for TikTok are videos focused on computer games as distinct from SLSSs [28] and YouTube [27]. In contrast with YouTube, videos dedicated to vehicles [26] or aimed at children [27] are also not found on TikTok. We suggest that the absence of the named categories is connected with the age of TikTok users, who are believed to be predominantly adolescents. This especially refers to the categories related to politics, professional life, vehicles, or parenting, which are more relevant for adults. In addition to that, a limit in length can influence the absence of videos, where users share their knowledge on topics such as education or technologies. To present such content in a short, interesting and understandable form requires additional mental preparation and, moreover, can remind on school classes, whereas youth may rather want to relax and have fun.

Comparing TikTok with Vine [25], further confirms that people tend to use short videos platforms for entertainment, posting videos with jokes, funny moments, singing, and dances. Selfie-like videos also tend to be peculiar on short video sharing services.

At the same time, unlike Vine [25], inappropriate harmful contents were not observed on TikTok. As to other law infringements, the cases of potential copyright violations, which are typical for all social networking services [17], were observed relatively frequently. However, the cases were treated as potential infringements in terms of very strict German legislation. In the USA, it would be rather viewed as “fair use.” Similarly to SLSSs [35], issues related to personal rights were observed in a small amount.

The content analysis additionally revealed that the much-talked-of content where young people appear in a sexy manner is not that frequent on the platform. However, harms, which can be potentially inflicted to younger users by strangers, are enormous, and even if they happen to one person only, they can be crashing and intolerable for that person. Therefore, more work should be undertaken with the performers as those could not be aware of the consequences to which can lead sexy posing on platforms where content is publicly available.

## 6 Limitations

As it was already mentioned, the videos in this study originate from Germany due to TikTok technical requirements, which pose some limitations on the implications of the results, as cultural aspects can influence users’ preferences in contents. Also due to the absence of demographic information in users’ profiles, the age of the users was not analyzed. Although, overall observations of the coders allow to conclude that TikTok is especially popular among adolescents, but not children. Moreover, the representatives of the “Generation X” [40] also find place on TikTok, often appearing together with their younger relatives.

## 7 Conclusion and Future Work

With this study we started to investigate TikTok as a prominent representative of mobile video sharing social media applications. The content analysis demonstrated that videos on TikTok are aimed at entertainment combined with self-expression and self-presentation. Appearance of mostly non-serious topics as opposed to politics and education (i.e., knowledge sharing) further confirm the tendency that TikTok is rather used to relax and have fun same as Douyin [6] and former Vine [25]. Furthermore, the study supports previous findings on the use of short video sharing services by younger individuals, stating that they view such platforms “as a stage to perform, tell stories, and express their opinions and identities in a performative way” [25].

Though, the service stipulates a lot of directions for future research. To improve users experience in the application, more work should be done to evaluate TikTok as an information service. The focus could be laid on the perceived and objective quality of TikTok as an information system measured by its perceived ease of use and perceived usefulness, on one hand, and by its functionality, usability, degree of gamification and efficiency, on the other hand, with all of the elements being important for evaluation of information services [41]. Not less important is to understand what motivates users to use the service. Do people use it exclusively to create and watch videos on the platform



and why they spend their time on those activities? Does the factor of socialization or the fear to be an outlier in offline life drive TikTok users as it is the case on YouNow [1] and Douyin [6], accordingly? In the light of strong criticism on TikTok because of the high possibility of cyber-grooming cases, a study aimed at the named problem should be additionally undertaken contributing to the safety of younger persons in online space. For that, videos of sexual contents could be intentionally searched for with the goal to further analyze the comments to them and, if possible and ethical, its effect on users.

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## References

1. Scheibe, K., Fietkiewicz, K.J., Stock, W.G.: Information behavior on social live streaming services. *J. Inf. Sci. Theory Pract.* **4**(2), 6–20 (2016)
2. ByteDance. <https://www.bytedance.com/en/about>. Accessed 20 Dec 2019
3. TikTok Newsroom: musical.ly and TikTok unite to debut new worldwide short-form video platform upgraded app, titled TikTok, now available globally. <https://newsroom.tiktok.com/en-us/musical-ly-and>. Accessed 20 Dec 2019
4. TikTok continues to lead social app download rankings in September. <https://www.socialmediatoday.com/news/tiktok-continues-to-lead-social-app-download-rankings-in-september/565692/>. Accessed 20 Dec 2019
5. TikTok Statistics That You Need to Know in 2020. <https://www.oberlo.com/blog/tiktok-statistics>. Accessed 20 Dec 2019
6. Lu, X., Lu, Z.: Fifteen seconds of fame: a qualitative study of Douyin, a short video sharing mobile application in China. In: Meiselwitz, G. (ed.) *HCI 2019*. LNCS, vol. 11578, pp. 233–244. Springer, Cham (2019). [https://doi.org/10.1007/978-3-030-21902-4\\_17](https://doi.org/10.1007/978-3-030-21902-4_17)
7. TikTok mit 5,5 Mio. aktiven Nutzern in Deutschland. <https://www.futurebiz.de/artikel/tiktok-nutzerzahlen-deutschland/>. Accessed 20 Dec 2019
8. Making Smart Content Choices on TikTok. <https://newsroom.tiktok.com/de-de/newsroom/making-smart-content-choices-on-tiktok>. Accessed 20 Dec 2019
9. TikTok Newsroom: DIY: Duets & Reactions on TikTok. <https://newsroom.tiktok.com/en-gb/diy-duets-reactions-on-tiktok>. Accessed 20 Dec 2019
10. Zhang, L., Wang, F., Liu, J.: Understand instant video clip sharing on mobile platforms: Twitter’s vine as a case study. In: *Proceedings of Network and Operating System Support on Digital Audio and Video Workshop*, pp. 85–90. ACM, New York (2014)
11. TikTok: Record fine for video sharing app over children’s data. <https://www.bbc.com/news/technology-47396767>. Accessed 20 Dec 2019
12. TikTok under investigation over child data use. <https://www.theguardian.com/technology/2019/jul/02/tiktok-under-investigation-over-child-data-use>. Accessed 20 Dec 2019
13. TikTok Transparency Report. <https://www.tiktok.com/safety/resources/transparency-report>. Accessed 20 Dec 2019

14. TikTok Has a Predator Problem. A Network of Young Women is Fighting Back. <https://www.buzzfeednews.com/article/ryanhatesthis/tiktok-has-a-predator-problem-young-women-are-fighting-back>. Accessed 20 Dec 2019
15. Warum Tik Tok für Kinder gefährlich werden kann. [https://www.focus.de/digital/handy/cybergrooming-warum-tik-tok-fuer-kinder-gefaehrlich-werden-kann\\_id\\_10407806.html](https://www.focus.de/digital/handy/cybergrooming-warum-tik-tok-fuer-kinder-gefaehrlich-werden-kann_id_10407806.html). Accessed 20 Dec 2019
16. Gurbani, V.K., Migliosi, A., State, R., Payette, C., Cilli, B., Engel, T.: A characterization of short-video and distributed hot-spot activity in Instagram. In: Proceedings of the Principles, Systems and Applications on IP Telecommunications, pp. 28–34. ACM, New York (2015)
17. Hoffmann, C.P., Lutz, C., Meckel, M.: Content creation on the Internet: a social cognitive perspective on the participation divide. *Inf. Commun. Soc.* **18**(6), 696–716 (2015)
18. McRoberts, S., Bonsignore, E., Peyton, T., Yarosh, S.: Do it for the viewers!: audience engagement behaviors of young YouTubers. In: Proceedings of the 15th International Conference on Interaction Design and Children, pp. 334–343. ACM, New York (2016)
19. Milkaite, I., Lievens, E.: Child-friendly transparency of data processing in the EU: from legal requirements to platform policies. *J. Child. Media* **14**(1), 5–21 (2019)
20. Badillo-Urquiola, K., Smriti, D., McNally, B., Golub, E., Bonsignore, E., Wisniewski, P.J.: Stranger danger!: social media app features co-designed with children to keep them safe online. In: Proceedings of the 18th ACM International Conference on Interaction Design and Children, pp. 394–406. ACM, New York (2019)
21. Rettberg, J.W.: Hand signs for lip-syncing: the emergence of a gestural language on musical. ly as a video-based equivalent to emoji. *Soc. Media+ Soc.* **3**(4) (2017)
22. Literat, I., Kligler-Vilenchik, N.: Youth collective political expression on social media: the role of affordances and memetic dimensions for voicing political views. *New Media Soc.* **21** (9), 1988–2009 (2019)
23. Chen, Z., He, Q., Mao, Z., Chung, H., Maharjan, S.: A study on the characteristics of Douyin short videos and implications for edge caching. In: Proceedings of the ACM Turing Celebration Conference – China, pp. 1–6. ACM, New York (2019)
24. Zimmer, F., Scheibe, K., Stock, W.G.: A model for information behavior research on social live streaming services (SLSSs). In: Meiselwitz, G. (ed.) SCSM 2018. LNCS, vol. 10914, pp. 429–448. Springer, Cham (2018). [https://doi.org/10.1007/978-3-319-91485-5\\_33](https://doi.org/10.1007/978-3-319-91485-5_33)
25. Yarosh, S., Bonsignore, E., McRoberts, S., Peyton, T.: YouTube: youth video authorship on YouTube and vine. In: Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing, pp. 1423–1437. ACM, New York (2016)
26. Che, X., Ip, B., Lin, L.: A survey of current YouTube video characteristics. *IEEE Multimed.* **22**(2), 56–63 (2015)
27. A Week in the Life of Popular YouTube Channels. <https://www.pewresearch.org/internet/2019/07/25/a-week-in-the-life-of-popular-youtube-channels/>. Accessed 14 Oct 2019
28. Friedländer, M.B.: Streamer motives and user-generated content on social live-streaming services. *J. Inf. Sci. Theory Pract.* **5**(1), 65–84 (2017)
29. van Oosten, J.M., Vandenbosch, L., Peter, J.: Gender roles on social networking sites: investigating reciprocal relationships between Dutch adolescents’ hypermasculinity and hyperfemininity and sexy online self-presentations. *J. Child. Media* **11**(2), 147–166 (2017)
30. García Jiménez, A., Montes Vozmediano, M.: Subject matter of videos for teens on YouTube. *Int. J. Adolesc. Youth* **24**(1), 63–78 (2020)
31. Scheibe, K., Zimmer, F.: Gender differences in perception of gamification elements on social live streaming services. *Int. J. Interact. Commun. Syst. Technol.* **9**(2), 1–15 (2019)
32. Khan, M.L.: Social media engagement: what motivates user participation and consumption on YouTube? *Comput. Hum. Behav.* **66**, 236–247 (2017)

33. Agrawal, S., Sureka, A.: Copyright infringement detection of music videos on YouTube by mining video and uploader meta-data. In: Bhatnagar, V., Srinivasa, S. (eds.) BDA 2013. LNCS, vol. 8302, pp. 48–67. Springer, Cham (2013). [https://doi.org/10.1007/978-3-319-03689-2\\_4](https://doi.org/10.1007/978-3-319-03689-2_4)
34. Zimmer, F., Fietkiewicz, K.J., Stock, W.G.: Law infringements in social live streaming services. In: Tryfonas, T. (ed.) HAS 2017. LNCS, vol. 10292, pp. 567–585. Springer, Cham (2017). [https://doi.org/10.1007/978-3-319-58460-7\\_40](https://doi.org/10.1007/978-3-319-58460-7_40)
35. Honka, A., Frommelius, N., Mehlem, A., Tolles, J.N., Fietkiewicz, K.J.: How safe is YouNow? An empirical study on possible law infringements in Germany and the United States. *J. MacroTrends Soc. Sci.* **1**(1), 1–17 (2015)
36. Livingstone, S., Kirwil, L., Ponte, C., Staksrud, E.: In their own words: What bothers children online? *Eur. J. Commun.* **29**(3), 271–288 (2014)
37. Huguenin, K., Kermarrec, A.M., Kloudas, K., Taïani, F.: Content and geographical locality in user-generated content sharing systems. In: Proceedings of the 22nd International Workshop on Network and Operating System Support for Digital Audio and Video, pp. 77–82. ACM, New York (2012)
38. Krippendorff, K.: *Content Analysis: An Introduction to its Methodology*, 2nd edn. Sage, Thousand Oaks (2004)
39. McMillan, S.J.: The challenge of applying content analysis for the World Wide Web. In: Krippendorff, K., Bock, M.A. (eds.) *The Content Analysis Reader*, pp. 60–67. Sage, Los Angeles (2009)
40. Fietkiewicz, K.J., Lins, E., Baran, K.S., Stock, W.S.: Inter-generational comparison of social media use: investigating the online behavior of different generational cohorts. In: Proceedings of the 49th Hawaii International Conference on System Sciences, pp. 3829–3838. IEEE Computer Society, Washington, DC (2016)
41. Schumann, L., Stock, W.G.: The information service evaluation (ISE) model. *Webology* **11** (1), 1–20 (2014)