



The Habits of TikTok Videoclip Usage by Teenage Users, the Filter Bubble, and the Perception of Content Similarity

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Abstract. The research object of this paper is the consumption of videoclips by users of adolescents between 12 and 18 years old. A sample from Beijing is taken as an example. the habits of use between different sample groups were explored and the factors that influence the perception of similarity of audiovisual content experienced by adolescent users when using the TikTok social network were analyzed. The research investigates the different usage motivations and preference types of videoclips according to age and gender and finds that viewing videoclips about knowledge/teaching or advertising/selling products decreases the perception of similarity of content. Second, algorithm recommendation knowledge for the TikTok platform is studied but reveals that it is not directly related to the perception of similarity. Third, the findings indicate that habits such as frequency and duration of use do not affect the perception of similarity, while all types of video clip tagging amplify the filter bubble complex in which adolescents are trapped.

Keywords: short video; algorithm recommendation; adolescent user; TikTok; similarity of content; filter bubble.

1 Introduction and Theoretical Framework

As barriers hindering access to digital technology are greatly reduced, there is a noticeable increase in demand for video clip platforms among teenage users, who possess basic technological skills with smartphones. Since the onset of the COVID-19 pandemic and subsequent lockdowns, the average daily duration spent by teenage users consuming videoclips has steadily increased, leading to the popularization of the social network TikTok and a surge in the creation and dissemination of audiovisual content on it. At the same time, urgent problems arise in the process of using specific software that operates with automatic algorithms, resulting in the bubble filter in which teenage users live.

1.1 Media Literacy in Children and Youth and ICT

Regarding the habits of media use and consumption among adolescents, it is demonstrated that the gender digital gap still exists and takes shape through the persistence of gender stereotypes and roles associated with men and women (Masanet; Pires; Gómez-Puertas, 2021)^[9]. On the other hand, it is suggested that children in countries where Internet access is more difficult in general have less confidence in their digital skills, with younger children in poorer countries being the most affected. Children in such contexts also have less support from the adults around them who have digital confidence (Livingstone; Nandi; Banaji; Stoilova, 2017)^[8].

The most frequent daily activities that minors perform on the Internet are communication with family and peers, entertainment (music, videos, and online gaming), and doing schoolwork (Garitaonandia; Karrera-Xuarros; Jimenez-Iglesias; Larrañaga, 2020)^[7]. Regarding the use and competence of mobile devices by students in school tasks, there are evident connections between applications/services and school subjects, as reflected in home learning practices (Rummler; Grabensteiner; Schneider, 2020)^[10].

1.2 The Video Platforms and Their Use

The evolution and different stages in the commercial and communication strategies of YouTube in Spain between 2009 and 2018 have been studied, leading to the gradual disappearance of participatory culture and its replacement by videos from professionalized users (YouTubers) and cultural industries (De-Aguilera-Moyano; Castro-Higueras; Pérez-Rufí, 2019)^[5].

It is noteworthy that the typology of videos created and disseminated by Spanish and British teenage TikTokers includes video selfies, choreographies, and videos for fun purposes. And boys and girls aged 16 and 17 are the most active on this social network. Age, not gender, is the determining variable for their digital production. On the other hand, the presence and impact of the media on this TikTok social network are low, and most of the content is created by user communities based on viral and entertainment content as well as current information.

1.3 Filter Bubble and Content Similarity

During the epidemic, online society has rapidly developed, with many teenage users experiencing significant stress during lockdown and acquiring basic knowledge of smartphone operations, leading to greater convenience and addiction to internet use (Fernandes; Biswas; Tan-Mansukhani; Vallejo; A. Essau, 2020)^[6]. However, they still do not understand or ignore the logic of how video clip platforms and recommendation system mechanisms work. Thus, when consuming the videoclips offered on the platforms for news and entertainment, they easily fall into the "filter bubble," where they become deeply immersed in their favorite information and cannot break free from it due to a lack of understanding of the filtering system mechanism.

In this regard, two main functions are proposed for an integrated conceptual tool: alerting users to a possible filter bubble and bursting the bubble. For the latter, remaining anonymous while online can be a solution to avoid potential bubble filters, and expanding users' awareness and encouraging them to explore different ideas (Amrollahi, 2019)^[1].

Based on previous research, the objectives pursued in this regard, and the main hypotheses are:

Identifying usage motivations and main themes of consumed videoclips. It is hypothesized that usage motivations and types of consumed videoclips are presented in different proportions depending on age range and gender, and furthermore, knowledge of algorithmic recommendation helps reduce the effect of the filter bubble.

Analyzing audiovisual types related to adolescent perception that videoclips with similar content outweigh those with different content. It is hypothesized that adolescents perceive videoclips with similar content more, and there are no significant differences based on different themes.

Investigating if there are any relationships between the perception of content similarity in videoclips and usage habits. It is hypothesized that if usage frequency increases and duration lengthens, a higher degree of similarity is perceived, and markings help increase this perception degree.

2 Methodology

This article analyzes the issues encountered by adolescents when using the TikTok social network during the epidemic period. It investigates the filter bubble related to recommendation algorithms, explores data from a survey on video clip consumption among users aged 12 to 18, and finally, examines the relationship between the perception of audiovisual content similarity and adolescents' computer technology habits.

In light of the theoretical framework outlined, and considering the scarcity of empirical studies in this area, this research is conducted based on a sample of 426 adolescents aged 12 to 18 who consumed videoclips on the TikTok platform during the epidemic in the city of Beijing. The surveys were administered through a structured questionnaire at eight educational centers in Beijing. The sample size is evenly distributed among the six courses of Compulsory Secondary Education, with a confidence level <95% and a $\pm 3\%$ sampling error (Camarero, 2013, pp. 235-236)^[3]. By gender, 51.2% are boys, and 48.7% are girls.

The data obtained from the survey were analyzed using the statistical program SPSS, V.26, and the level of statistical validity was established for the value $p < .05$. Starting from basic descriptive statistics, more complex inferential statistical analyses were conducted. In general, the survey analysis consists of three parts. The first part examines the reasons for consuming videoclips and types of videoclips on the TikTok social network according to basic demographic variables, including age range and gender. The second part addresses dimensions related to the perception of content similarity of the videoclips consumed in the context of the epidemic, including types of

videoclips and knowledge of recommendation algorithms. The third part involves measuring correlations between usage habits and the perception of similarity using a five-point Likert scale.

3 Results

Through the analysis of the response questions with SPSS, it is observed that around 90% of adolescents consume videoclips for entertainment purposes, and over 77% do so to relieve stress. Meanwhile, it is noted that the aspects of checking news (over 42%) and enriching knowledge (36%) also form part of the preferences for usage purposes, as shown in Table 1. It can be argued that adolescents do not consider the TikTok video clip software as a place solely for entertainment. As a platform product, TikTok also has the important function of disseminating knowledge and information (Fiallos Ordoñez; Fiallos; Figueroa, 2021)^[2].

When comparing different age groups through ANOVA testing, significant differences are revealed in making friends ($F=6.193$, $p=0.002<0.01$). In this regard, users aged 13 to 14 years (18.45%, $p=0.001<0.05$) and those aged 15 to 16 years (8.64%) showed a higher percentage in making friends than those aged 17 to 18 years (5.59%). (See Table 1).

Table 1. Percentage of usage motivations by age range

Use	13~14 years	15~16 years	17-18 years	M	F	Sig.
Entertainment	90.29	91.93	88.89	90.4	0.426	0.653
Stress relief	77.67	77.64	79.01	78.2	0.54	0.947
News browsing	51.46	52.17	42.59	48.4	1.748	0.175
Knowledge enrichment	44.66	36.65	38.27	39.2	0.891	0.411
Product exploration	27.18	31.06	23.46	27.2	1.175	0.310
Making friends	5.59	8.64	18.45	9.9	6.193	0.002**
Others	16.50	11.18	9.26	11.7	1.635	0.196

When considering gender, statistically significant differences exist in four purposes of use as follows: for knowledge enrichment ($\chi^2=12.006$, $p=0.001<0.01$), 54.00% of boys compared to 34.66% of girls; for making friends ($\chi^2=3.886$, $p=0.049<0.05$), 15.00% of boys compared to 8.28% of girls; for entertainment ($\chi^2=10.539$, $p=0.001<0.01$), 92.94% of girls compared to 82.00% of boys; for product exploration ($\chi^2=13.354$, $p=0.000<0.01$), 31.60% of girls compared to 13.00% of boys. (See Table 2).

Table 2. Motivations of use by gender

	Sex		χ^2	p
	boy	girl		
Knowledge enrichment	54.00%	34.66%	12,006	0.001**

Stress relief	76.00%	78.83%	0,36	0,548
Making friends	15.00%	8.28%	3,886	0.049*
Entertainment	82.00%	92.94%	10,539	0.001**
News browsing	52.00%	47.24%	0,695	0,405
Product exploration	13.00%	31.60%	13,354	0.000**
Others	11.00%	11.96%	0,069	0,793

Through the ANOVA test, the differences between age groups in all types of consumed videoclips are not significant ($p > 0.05$). They tend to consume entertainment videoclips more frequently (84.04%), followed by news and information (48.83%), knowledge and educational content (46.48%), and music and dance (41.78%) (cf. figure 1). (See Fig. 1).

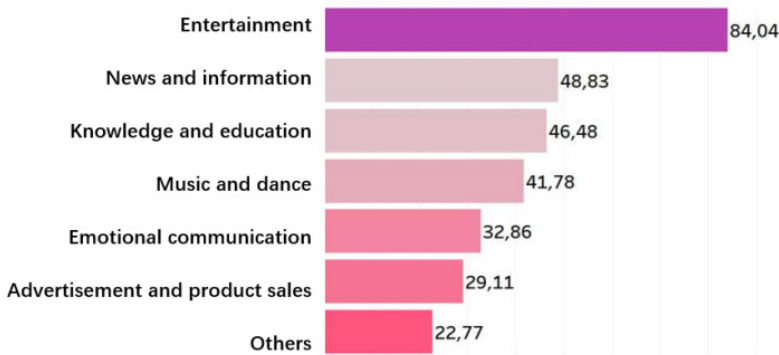


Fig. 1. Preference of consumed video clip types

Regarding gender, statistically significant differences ($p < 0.05$) are evident in the types of videoclips consumed based on the four grouping variables. Considering knowledge and education ($\chi^2 = 14.338, p = 0.000 < 0.01$), boys (63.00%) are more likely to watch this type of videos than girls (41.41%). Regarding music and dance ($\chi^2 = 5.143, p = 0.023 < 0.05$), girls (44.79%) are more likely to watch this type of videos than boys (32.00%). As for entertainment videos ($\chi^2 = 4.825, p = 0.028 < 0.05$), girls (86.20%) showed a higher percentage of viewership than boys (77.00%). Considering advertisement and product sales ($\chi^2 = 6.470, p = 0.011 < 0.05$), more girls (32.21%) watch than boys (19.00%).

More than 50% of the respondents believe that videoclips with similar content outnumber those with different content. The perception of content similarity shows a relatively moderate level of agreement (Mean=3.23>3, S.D. =1.07). It should also be noted that there are no statistical differences in gender ($F = 1.310, p = 0.486 > 0.05$) or age ($F = 0.220, p = 0.802 > 0.05$). (See Fig. 2).

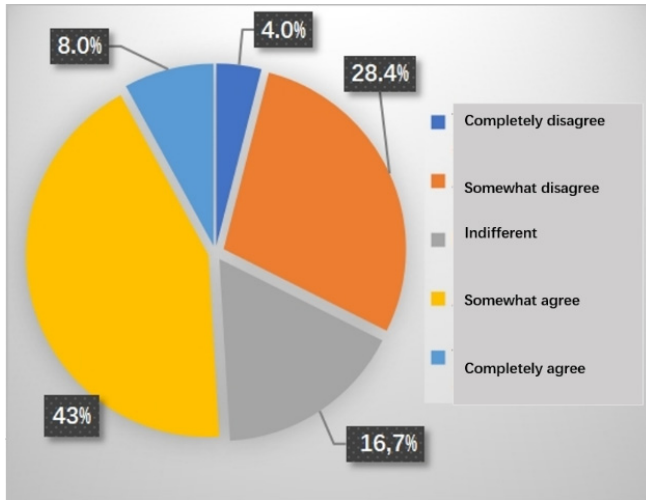


Fig. 2. Perception of content similarity of consumed videoclips

Regarding the types of consumed videoclips, a T-test is conducted to measure the perception of more similar content videoclips using the Likert scale. The perception of similarity is reflected in all types of videoclips ($M > 3.0$), and statistically significant differences are observed between knowledge and education ($F = 3.708, p = 0.04 < 0.05$) and advertisement and product sales ($F = 0.126, p = 0.013 < 0.05$). Comparing with the means of these variables, participants who viewed videoclips related to knowledge/education and advertisement/product sales are less likely to perceive content similarity. (See Table 3).

Table 3. Perception of content similarity according to the types of consumed videoclips

	M	S.D.	F	t	Sig. (bilateral)
Knowledge and education	3.11	1.112	3.708	-2.062	.040
Music and dance	3.16	1.078	.336	-1.113	.267
Entertainment	3.22	1.063	.161	-.207	.836
Advertisement and product sales	3.02	1.078	.126	-2.502	.013
Emotional communication	3.14	1.036	.053	-1.114	.266
News and information	3.21	1.074	.019	-.260	.795
Others	3.20	1.017	1.068	-3.08	.758

Significant differences in understanding algorithmic recommendation are obtained according to age range through the chi-square test ($\chi^2 = 3.023, p < 0.05$). It has been found that 67.9% ($p = 0.05$) of adolescents aged 17-18 and 62.1% ($p = 0.03$) of those aged 15-16 understand algorithmic recommendation of videoclips, while 54.66% of adolescents aged 13-14 comprehend it. Similarly, significant differences in understanding algorithmic recommendation are also obtained according to gender ($\chi^2 = 13.256, p = 0.000 < 0.01$). Furthermore, it has been found that 77.00% of boys

understand algorithmic recommendation of videoclips, while 56.75% of girls comprehend it.

Table 4. Understanding of algorithmic recommendation in video clip software by age and gender

			Media	χ^2	p
Age	13-14	54.7	61.50	3.023	0.050*
	15-16	62.1			
	17-18	67.9			
Sex	Boy	77.00	61.50	13,256	0.000**
	Girl	56.75			

The chi-square test was conducted to examine the relationship between knowledge of algorithmic recommendation and perception of content similarity (See Table 4); however, the result shows no significant effect ($p=0.177>0.05$).

Regarding the perception of content similarity, ANOVA also reveals no differences in usage frequencies ($F=0.15, p=0.93>0.05$) or usage duration ($F=0.01, p=0.983>0.05$).

A Pearson correlation test was conducted to examine the relationships between subscribing to interested videoclips and perception of similarity, resulting in a statistically significant difference and a weak relationship ($r=0.208, p=0.000<0.05$). Similarly, statistically significant differences and weak relationships were found between perception of similarity and liking ($r=0.188, p<0.05$), as well as sharing, commenting, or saving ($r=0.172, p<0.05$). Additionally, a bivariate correlation test was conducted to examine the relationships between reporting uninterested videoclips and perception of similarity, resulting in a statistically significant difference ($r=0.131, p<0.05$). (See Table 5).

Table 5. Correlations between different markings in perception of similarity

	Pearson correlation	Sig. (bilateral)
Subscribe	0.208	.000*
Like	0.188	.000*
Share, comment, or save	0.172	.000*
Report	0.131	.131*

4 Conclusions

In our case, almost half of the teenagers consume videoclips to check updated news and acquire knowledge, reflecting the fact that teenagers are fascinated by watching educational and informative videoclips on the TikTok platform.

Gender and age differences are detected, with boys being the ones who use this video platform more to enrich their knowledge, and boys aged 12 and 13 use it more to make friends, while girls are more inclined to learn about products and have fun with this platform. Regarding the preferred types of videoclips, the results obtained are in line with the main motivations indicated, with entertainment, news, and knowledge and

teaching being the preferred types, however, no statistical differences are evident with respect to age. The questionnaire results show the existence of significant differences in gender as well as the results of motivations, reflecting that boys prefer videos related to knowledge and teaching, while girls prefer topics related to fun, music and dance, and product advertisements.

With algorithmic recommendation, adolescents are more likely to fall into the filter bubble, with an excess of similar videoclips being played and presented on the TikTok platform. About half of the respondents perceive that videoclips with similar content outnumber those with different content. However, in our case, the perception of content similarity does not come from viewing videoclips of knowledge/teaching and product advertising/selling for adolescents. TikTok presents a young and global audience with various opportunities for knowledge dissemination in diverse fields of science in a concise and effective manner (Fiallos Ordoñez; Fiallos; Figueroa, 2021)^[2]. On the other hand, advertising and product placements on the TikTok social network, with the algorithm capturing demand to evaluate popular videos, can reach these users in a fun and interactive way (Chenkov-Shaw, 2021)^[4], thus having a strong and significant effect on consumer purchasing decisions and allowing for easy marketing of products to teenage masses, contributing to decreasing the perception of content similarity.

The results reveal that there are more teenagers over 15 years old than younger ones, and more boys than girls who are aware of the algorithmic recommendation of videoclips. However, knowledge of algorithmic recommendation does not affect the perception of content similarity in any way.

Both the frequency and duration of video clip usage with search and recommendation algorithms by adolescent users have significantly increased during the pandemic. The largest group consists of those who consume at least once a day. In the epidemic era, the platform is used for a longer time, but in effect, frequency and duration of use are not related to the perception of content similarity.

Recommendation algorithms that determine query results have made the offered audiovisual content more tailored to users' tastes to attract them and thus generate a dependence on the platform. The results revealed that content consumption seems more similar and personalized with all kinds of operations of likes or dislikes from teenagers. It should be noted that subscribing is more related to the perception of content similarity offered while reporting still increases this same perception of similarity.

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