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Analysis of User's Balance Between Private and Public

– One Case from the TikTok

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Abstract: Information privacy is of paramount importance to everyone, but there are many Internet users' privacy leaks. But inevitably, internet users need to provide some information of their own to satisfy a better web experience. Therefore, it is necessary to study the balance between personal information sharing and personal privacy. The study's goal is to develop a mathematical model that quantifies the trade-offs between individuals and society regarding the disclosure of private information. In the process of research, researchers use targeted questionnaires to obtain first-hand raw data, analyze users' choices between sharing personal data and protecting personal privacy, and obtain users' preferences for privacy protection measures. Through multi-dimensional statistical analysis of the questionnaire results, this paper reflects the current users' awareness of personal privacy protection and the public's attitude towards the current phenomenon of privacy acquisition on social media. Furthermore, based on the original data of the questionnaire, it provides effective suggestions for researchers to modify the privacy protection policies of media platforms.

Keywords: information privacy, questionaire, web experience

1. Introduction

People now depend on the Internet for a wide variety of software applications, which has become a necessary component of daily life. The user has to actively or passively supply personal information in order to utilize the program. Some teenagers will freely give up their personal information to join social media, and some of them are extremely private information [1]. In particular, after a large number of people gradually change from real social networking to online social networking, the information of everyone participating in online social networking will be recorded on the Internet, and when expressing some controversial views, a person's "private" information can be quickly spread by others through the Internet, and personal privacy will face a huge threat [2]. Moreover, even if users do not actively provide their private information on the Internet, some social media sites will use obscure ways to force users to provide real information. At the same time, different software will collect the information of each user who uses these software, and personal information will sometimes be re-sent to a third party without users' knowledge [3].

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Privacy protection laws for internet users are not mature, and their privacy is not guaranteed. Leaked information complicates protection, and awareness is low. It is crucial for users to measure and coordinate privacy sharing and protection. Data on user attitudes and views on software privacy agreements is essential for regulating the internet market and forming laws.

As early as 2004, in the early days of Internet development, Naresh K. Malhotra et al. proposed the concept of e Internet Users' Information Privacy Concerns (IUIPC), and constructed a causal model based on this concept to analyze online consumers' responses to privacy threats [4]. Since then, the privacy of network information has attracted more and more attention. What followed was a multi-level analysis of information privacy. In 2011, Robert integrated past concepts and research on information privacy and found that due to the limitations of the sample, the relevant theories of information privacy have limitations. He called for the adoption of A wider research sample population and publication of more relevant journal articles [5]. In the same year, an interdisciplinary review of information privacy research [6] and a comprehensive research paper on information privacy and information systems were published [7]. These theories and research help to promote the promising research direction of information privacy and information system research. As more and more people participate on the Internet, Internet privacy concerns (IPC) are becoming a field of research that has received a lot of attention. By summarizing previous literature, Hong and James studied various concepts of IPC and promoted the solution of the key fundamental dimensions of IPC, the structure of IPC factors, and the inconsistency of the wording of the original provisions in previous IPC documents [8]. In recent years, with the popularity of social media and the explosive output of various kinds of apps, people are increasingly relying on Internet-based services, which leads to deeper privacy issues and endless privacy leaks [9]. The footprint of people's activities has gradually shifted from reality to the Internet, and a large amount of personal information has been recorded, classified and sold, while the United States is formulating laws and regulations to protect certain information of people on social media [10]. In addition, the phenomenon that some people are leaked and fired due to social media posts has aroused China's reflection on Internet privacy [11-12]. With the increasing speed of information dissemination, everyone inevitably has the security problem of information privacy.

This study uses a targeted questionnaire to gather information on users' perceptions of the value of privacy and personal privacy in today's popular social media platforms. It then analyzes the data to examine privacy protocol governance from the viewpoints of the Internet and the government, performing reliability testing, difference analysis, association analysis, regression analysis, and cluster analysis on both single data and multiple data sets. The analysis leads to the conclusion that supports people in making wise decisions about the disclosure of their personal information.

2. Description of the Basic Results of the Questionnaire

This survey aimed to understand user permissions in social media software, focusing on protecting personal privacy and balancing privacy with improved services. And this study collects 216 questionnaires, focusing on personal information, device usage, and internet privacy policies, with rigorous design guidelines.

According to the survey results, when answering the first question, "What is your gender?" 56.48% were female, and anonymous accounted for 4.17% of the total respondents. The interviewees' ages are divided in the second question. The population that participated in the survey tended to be younger, as seen by the fact that those aged 19 to 25 made up 54% of the population while those under 19 and those 46 and over made up only 2.3% and 4%, respectively. For the third query, "Which social software do you use most?" The most popular pieces of software mentioned in the questions are communication apps like WeChat, social networking apps like Weibo and Instagram, and photo and video sharing apps like TikTok. Additionally, the answer to question number four, "Q4. On which

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mobile devices do you usually use social software," reveals that most users use social media sites on their smartphones or tablets. The aforementioned statistics show that social media networks are used by people of all ages in society, with young people using them the most.

About "Q5. How do you feel about being photographed by strangers?", "Q6. How do you handle receiving cold calls?", "Q7. Do you regularly clean your social media chats?", "Q8. How do you feel about logging in to your account on a public device?", "Q9. Do you express your views concerning the privacy of others on social platforms?" and "Q10. Do you change the account password regularly? " The authors wants to ask whether the respondents have a sense of privacy protection. When people encounter phenomena, such as being photographed by others and unknown phone calls, they usually choose to protect their privacy. In addition, the percentage of people who choose to regularly or occasionally clean their social media chats is more than 75%. Nearly 50% expressed a tendency to be interested in and comment on the privacy of others, while only 45% never expressed an opinion on the privacy of others, and about 33% never changed their passwords regularly. These two phenomena show that people are less concerned and aware of privacy protection online than in real life, not only in terms of interference and protection of others' privacy, but also in terms of protection of their own privacy.

Respondents are asked to list several types of software, such as those for reading/sending messages, making calls, reading contacts, opening cameras/photo albums, reading geographic information, opening recordings, and reading a list of mobile phone software, in response to the eleventh question. The survey indicates that individuals choose the appropriate permissions based on different app features, indicating a basic understanding of the use and protection of apps.

Questions 12-27 are directed to respondents' understanding of their privacy rights on the TikTok platform. "Q12. How long do you use TikTok every day?" The results show that 51.85% of users use TikTok for between one and two hours a day, 21.3% use it for less than one hour a day, and 23.61% use it for three to five hours a day. "Q13. Have you read the Privacy Policy of TikTok?" reflects that 38.89% of people have never read the privacy policy, 49.07% have read part of the terms and conditions, and 12.04% have read the full text of the terms and conditions.

The survey shows users' tolerance for TikTok rights depends on comparable services. When asked if they would be prepared to provide TikTok access to their address in exchange for suggesting a friend or loved one to contact, 38.89% protested, 33.8% said it depends on the situation, but 27.32% nevertheless agreed to do so. Only 22.22% of respondents, like the example above, are willing to give up some privacy in exchange for services that are more convenient, and 42.59% are unwilling to share information about installed apps. Following the collection of the aforementioned questionnaire data, the authors conducted the following data analysis after first gaining an overview of user privacy protection awareness (See Table 1).

Table 1: Description of the questionnaire (Partial).

Q14. Have you proactively adjusted the privacy Settings of TikTok?
Q15. Do you approve TikTok to obtain address book information?
Q16. Do you agree with the geographical location of TikTok read?
Q17. Do you agree that TikTok can obtain photo album information?
Q18. Do you agree that TikTok has excessive access to rights?
Q19. What do you think is the reason for TikTok's excessive access?
Q20. What do you think is the main reason for TikTok's personal security problems?
Q21. What will you do if personal information is leaked as a result of TikTok?

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Table 1: (continued).

Q22. Do you agree that TikTok needs to prompt users when using the privacy limit?
Q23. Do you think the current steps for obtaining permissions on TikTok need to be improved?
Q24. Are you willing to provide microphone rights in exchange for TikTok identifying your shopping needs through recording?
Q25. Are you willing to provide your address book information in exchange for TikTok recommending contacts related to your friends or relatives?
Q26. Are you willing to provide browsing history in exchange for TikTok's recommendation of media content more in line with your preferences?
Q27. Are you willing to provide a convenient way to jump to third-party platforms in exchange for the list of installed applications on the TikTok platform?

3. Differential Analysis

Differential Analysis is used to analyze the relationship between demographic variables - questions 1-2, and other questions. The principle of differential analysis is to determine whether the between-group (treatment) differences are significantly greater than the within-group (error) differences.

3.1. Demographic Variables and Identity with Privacy

The differential analysis between demographic variables and identity with privacy allows the relationship between them to be drawn. The demographic variables are divided into gender and age. So, this experiment does two analyses of variance: gender and identity with privacy, and age and identity with privacy.

3.1.1. Gender and Identity with Privacy

Questions 5-11 are about identity with privacy. Differential Analysis is performed for the question 1 and the questions 5-11. All variables presenting significance ($p<0.05$), 19 in total, are as follows in Table 2:

Table 2: Gender and identity with privacy.

Question	Female	Male	Confidential	F
Q5	2.12±0.79	2.73±0.96	1.78±0.83	14.519**
Q9	1.57±0.75	2.02±0.86	1.78±1.01	7.748**
Q11 (Read/send information) (Life & shopping)	0.44±0.50	0.25±0.43	0.44±0.53	4.368*
Q11 (Read/send information) (Audio & video images)	0.30±0.46	0.15±0.36	0.11±0.33	3.615*
Q11 (Read/send information) (Social Communication)	0.54±0.50	0.35±0.48	0.22±0.44	4.726**
Q11 (Calling) (Social Communication)	0.50±0.50	0.35±0.48	0.11±0.33	4.223*
Q11 (Read Address Book) (Social Communication)	0.54±0.50	0.33±0.47	0.22±0.44	5.693**
Q11 (Open camera/album) (Life & shopping)	0.33±0.47	0.14±0.35	0.33±0.50	4.903**

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Table 2: (continued).

Q11 (Open camera/album) (Audio & video images)	0.49±0.50	0.21±0.41	0.11±0.33	10.605**
Q11 (Open camera/album) (Social Communication)	0.42±0.50	0.31±0.46	0.00±0.00	4.069*
Q11(Read geographic information) (Life & shopping)	0.39±0.49	0.18±0.38	0.33±0.50	5.796**
Q11(Read geographic information) (Social Communication)	0.39±0.49	0.26±0.44	0.11±0.33	3.110*
Q11(Read geographic information) (Traveling & Map)	0.61±0.49	0.39±0.49	0.11±0.33	8.578**
Q11 (Enable recording) (Life & shopping)	0.20±0.40	0.06±0.24	0.22±0.44	4.215*
Q11 (Enable recording) (Audio & video images)	0.30±0.46	0.16±0.37	0.11±0.33	3.109*
Q11 (Enable recording) (Social Communication)	0.47±0.50	0.32±0.47	0.11±0.33	4.008*
Q11 (Enable recording) (Learning & Education)	0.25±0.43	0.12±0.32	0.00±0.00	3.882*
Q11(Read the list of installed applications)(Life & shopping)	0.28±0.45	0.13±0.34	0.33±0.50	3.635*
Q11(Read the list of installed applications)(Social Communication)	0.39±0.49	0.21±0.41	0.33±0.50	3.569*

**. At the 0.01 level (two-tailed), the correlation is significant.
*. At the 0.05 level (two-tailed), the correlation is significant.

The table shows that women generally score higher, with men scoring higher in questions 5 and 9. Women are more concerned about their privacy in daily life but are more willing to give their private information to the software.

3.1.2. Age and Identity with Privacy

Questions 5-11 are about identity with privacy. Differential Analysis is performed for the question 2 and the questions 5-11. All variables presenting significance ($p<0.05$), 24 in total, are as follows in Table 3:

Table 3: Age and identity with privacy.

Question	0-18	19-25	26-30	31-45	46-55	Above 56	F
Q5	2.20±1.20	2.12±0.83	2.60±0.93	2.63±0.94	2.88±0.84	3.00	3.783**
Q6	2.20±0.84	2.11±0.87	2.52±0.84	2.20±0.72	1.88±0.64	1.00	2.403*

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Table 3: (continued).

Q9	1.80±0.84	1.53±0.78	2.06±0.89	2.06±0.68	2.00±1.07	1.00	4.626**
Q10	2.00±1.00	2.30±0.69	2.20±0.61	1.89±0.47	2.13±0.35	2.00	2.416*
Q11(Read/send information) (Life & shopping)	0.60±0.55	0.54±0.50	0.12±0.33	0.11±0.32	0.25±0.46	1.00	9.835**
Q11(Read/send information) (Audio & video images)	0.00±0.00	0.32±0.47	0.18±0.39	0.09±0.28	0.13±0.35	1.00	3.079*
Q11(Read/send information) (Social Communication)	0.00±0.00	0.58±0.50	0.34±0.48	0.34±0.48	0.13±0.35	0.00	4.401**
Q11(Read/send information) (Learning & Education)	0.00±0.00	0.44±0.50	0.16±0.37	0.29±0.46	0.13±0.35	0.00	3.885**
Q11 (Calling) (Life & shopping)	0.40±0.55	0.33±0.47	0.08±0.27	0.11±0.32	0.25±0.46	0.25±0.46	4.161**
Q11(Calling) (Social Communication)	0.40±0.55	0.55±0.50	0.26±0.44	0.31±0.47	0.13±0.35	1.00	3.993**
Q11(Calling) (Traveling &Map)	0.20±0.45	0.27±0.45	0.22±0.42	0.51±0.51	0.13±0.35	0.00	2.365*
Q11(Read Address Book) (Life & shopping)	0.00±0.00	0.18±0.39	0.10±0.30	0.06±0.24	0.13±0.35	1.00	2.301*
Q11(Read Address Book) (Social Communication)	0.20±0.45	0.59±0.49	0.26±0.44	0.31±0.47	0.25±0.46	0.00	4.891**
Q11(Open camera/album) (Life & shopping)	0.20±0.45	0.36±0.48	0.10±0.30	0.09±0.28	0.38±0.52	1.00	4.739**

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Table 3: (continued).

Q11(Open camera/album) (Audio & video images)	0.40±0.55	0.49±0.50	0.18±0.39	0.39±0.46	0.13±0.35	0.00	3.920**
Q11(Open camera/album) (Financial Management)	0.00±0.00	0.15±0.35	0.32±0.47	0.26±0.44	0.00±0.00	0.00	2.274*
Q11(Read geographic information) (Life & shopping)	0.20±0.45	0.46±0.50	0.14±0.35	0.03±0.17	0.25±0.46	1.00	8.172**
Q11(Read geographic information) (Games& Entertainment)	0.00±0.00	0.25±0.43	0.04±0.20	0.09±0.28	0.00±0.00	0.00	3.448**
Q11(Read geographic information) (Traveling & Map)	0.40±0.55	0.63±0.48	0.40±0.50	0.34±0.48	0.13±0.35	0.00	4.134**
Q11 (Enable recording) (Life & shopping)	0.00±0.00	0.18±0.39	0.08±0.27	0.09±0.28	0.25±0.46	1.00	2.333*
Q11 (Enable recording) (Games& Entertainment)	0.40±0.55	0.35±0.48	0.08±0.27	0.09±0.28	0.13±0.35	0.00	4.577**
Q11 (Enable recording) (Audio & video images)	0.20±0.45	0.33±0.47	0.12±0.33	0.17±0.38	0.00±0.00	0.00	2.755*
Q11(Enable recording) (Social Communication)	0.00±0.00	0.50±0.50	0.26±0.44	0.37±0.49	0.13±0.35	0.00	3.188**
Q11 (Read the list of installed applications) (Life & shopping)	0.00±0.00	0.32±0.47	0.10±0.30	0.09±0.28	0.13±0.35	1.00	4.424**

**. At the 0.01 level (two-tailed), the correlation is significant.
*. At the 0.05 level (two-tailed), the correlation is significant.

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Middle-aged and young people are less concerned about privacy security in daily life. Permissions to software are directly proportional to the software used, with middle-aged individuals more willing to grant permissions to financial software and young people more willing to grant permissions to audio and video image software.

The 19-25 age group has the significantly highest willingness to give software permission classes.

3.2. Demographic Variables and Agreement with TikTok Permissions

The differential analysis between demographic variables and agreement with TikTok permissions allows the relationship between them to be drawn. The demographic variables are divided into gender and age. So, this experiment does two analyses of variance: gender and agreement with TikTok permissions, and age and agreement with TikTok permissions.

3.2.1. Gender and Agreement with TikTok Permissions

Questions 12-23 are about agreement with TikTok permissions. Differential Analysis is performed for the question 1 and the questions 12-23. All variables presenting significance ($p<0.05$), 10 in total, are as follows in Table 4:

Table 4: Gender and agreement with TikTok permissions.

Question	Female	Male	Confidential	F
Q12	1.98±0.80	2.27±0.68	1.78±0.44	4.528*
Q13	1.59±0.63	1.89±0.64	2.11±0.93	7.203**
Q15	1.73±0.62	1.99±0.59	1.89±0.60	4.615*
Q16	1.76±0.73	2.07±0.72	2.00±0.89	4.560*
Q19(A. To promote advertising)	0.61±0.49	0.42±0.50	0.44±0.53	3.564*
Q20(A. Weak awareness of security protection of personal information)	0.55±0.50	0.36±0.48	0.67±0.50	4.159*
Q20(C. Relevant supervision is not in place)	0.73±0.45	0.59±0.50	0.33±0.50	4.533*
Q20(E. Lack of self-discipline in the industry)	0.64±0.48	0.35±0.48	0.11±0.33	12.234**
Q22	3.94±1.26	3.41±1.25	2.11±1.36	11.590**
Q23	3.69±1.20	3.31±1.07	2.56±1.42	5.822**

**. At the 0.01 level (two-tailed), the correlation is significant.
*. At the 0.05 level (two-tailed), the correlation is significant.

Men use TikTok longer and support privacy access, while women agree more with the privacy-related problems in micro, medium and macro, and think more that improvements should be made.

3.2.2. Age and Agreement with TikTok Permissions

Questions 12-23 are about agreement with TikTok permissions. Differential Analysis is performed for the question 2 and the questions 12-23. All variables presenting significance ($p<0.05$), 10 in total, are as follows in Table 5:

Table 5: Age and agreement with TikTok permissions.

Question	0-18	19-25	26-30	31-45	46-55	Above 56	F

DOI: 10.54254/2753-7064/12/20230070

Table 5: (continued).

Q13	1.80±0.45	1.50±0.61	2.02±0.62	1.94±0.64	2.25±0.71	2.00	7.319**
Q15	2.40±0.55	1.70±0.59	2.00±0.61	2.03±0.62	1.63±0.52	2.00	3.803**
Q17	2.60±0.55	1.78±0.53	2.04±0.61	2.00±0.69	1.75±0.71	1.00	3.848**
Q19 (A. To promote advertising)	0.60±0.55	0.72±0.45	0.22±0.42	0.34±0.48	0.38±0.52	1.00	10.298**
Q19 (B. Digging into user habits to provide better services)	0.80±0.45	0.75±0.43	0.60±0.50	0.66±0.48	0.13±0.35	0.00	3.817**
Q20 (A. Weak awareness of security protection of personal information)	0.60±0.55	0.62±0.49	0.26±0.44	0.34±0.48	0.25±0.46	1.00	5.523**
Q20 (B. The relevant laws are not perfect)	0.60±0.55	0.62±0.49	0.44±0.50	0.57±0.50	0.13±0.35	0.00	2.386*
Q20 (E. Lack of self-discipline in the industry)	0.20±0.45	0.68±0.47	0.20±0.20	0.43±0.50	0.38±0.52	0.00	8.91**
Q22	3.00±1.41	4.15±1.14	3.04±1.27	3.26±1.34	2.63±1.20	3.00	8.649**
Q23	3.66±1.32	2.60±1.52	3.78±1.12	3.06±1.11	3.13±0.84	1.00	4.718**

**. At the 0.01 level (two-tailed), the correlation is significant.
*. At the 0.05 level (two-tailed), the correlation is significant.

Middle-aged and older people read privacy policies more thoroughly, disagreeing with TikTok's access to privacy. Young people attribute the cause to themselves, while middle-aged think responsibility lies in law and industry. Middle-aged and young people are more likely to believe that TikTok needs to remind users that improvements are needed.

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3.3. Demographic Variables and Willingness to Provide Partial Access to TikTok for Better Service

This experiment analyzes the relationship between demographic variables, gender and age, and their willingness to provide partial access to TikTok for better service. So this experiment does two analysis of variance: gender and willingness to provide partial access to TikTok for better service, and age and willingness to provide partial access to TikTok for better service.

3.3.1. Gender and Willingness to Provide Partial Access to TikTok for Better Service

Questions 24-27 are about willingness to provide partial access to TikTok for better service. Differential Analysis is performed for the question 1 and the questions 24-27. All variables presenting significance ($p<0.05$), 2 in total, are as follows in Table 6:

Table 6: Gender and agreement with willingness to provide partial access to TikTok for better service.

Question	Female	Male	Confidential	F
Q24	2.43±1.06	2.93±1.02	1.89±0.78	8.144**
Q25	2.54±1.14	3.06±1.12	2.78±1.48	5.136**

**. At the 0.01 level (two-tailed), the correlation is significant.
*. At the 0.05 level (two-tailed), the correlation is significant.

It can be seen that men are more willing to provide partial access in exchange for better service.

3.3.2. Age and Willingness to Provide Partial Access to TikTok for Better Service

Questions 24-27 are about willingness to provide partial access to TikTok for better service. Differential Analysis is performed for the question 2 and the questions 24-27. All variables presenting significance ($p<0.05$), 3 in total, are as follows in Table 7:

Table 7: Age and agreement with willingness to provide partial access to TikTok for better service.

Question	0-18	19-25	26-30	31-45	46-55	Above 56	F
Q24	2.60±1.52	2.36±1.05	2.82±1.00	3.09±1.07	2.63±0.74	3.00	3.247**
Q25	2.60±1.52	2.47±1.13	3.22±0.89	3.14±1.33	2.38±1.06	3.00	4.263**
Q27	1.80±1.30	2.50±1.07	2.76±1.00	3.26±1.09	2.38±0.92	4.00	3.908**

**. At the 0.01 level (two-tailed), the correlation is significant.
*. At the 0.05 level (two-tailed), the correlation is significant.

It can be seen that young people are more willing to provide partial access in exchange for better services.

4. Association Analysis

Correlation analysis examines the relationship between dependent and independent variables using four categories: nominal multiple-choice questions, nominal single choice questions, ordered single choice questions, and scales.

4.1. Correlation Analysis with Nominal Multiple Choice Questions

The dependent variable is defined as questions 24-27, the users were willing to provide partial access to TikTok to get better service, and the rest were independent variables, using multiple response analysis combined with cross-tabulation chi-square test (See Table 8).

DOI: 10.54254/2753-7064/12/20230070

Table 8: Correlation analysis with nominal multiple choice questions.

Significance / Question	Q24	Q25	Q26	Q27
Q3	0.087	0.035	0.310	0.606
Q4	0.771	0.639	0.665	0.540
Q19	0.609	0.572	0.230	0.859
Q20	0.538	0.871	0.816	0.984

Only question 3 is significantly correlated with question 25. The following is the cross tabulation of question 3 with question 25 (See Table 9).

Table 9: Q25 and Q3 cross tabulation.

		Q3: You use more of the following social media					
			A.	B	C	D	Count
Q25	A	Count	35	18	32	11	41
		Percentage of Q25	85.4%	43.9%	78.0%	26.8%	
		Percentage of Q3	24.6%	14.1%	23.7%	28.2%	
	B	Count	34	32	28	14	43
		Percentage of Q25	79.1%	74.4%	65.1%	32.6%	
		Percentage of Q3	23.9%	25.0%	20.7%	35.9%	
	C	Count	50	39	42	10	73
		Percentage of Q25	68.5%	53.4%	57.5%	13.7%	
		Percentage of Q3	35.2%	30.5%	31.1%	25.6%	
	D	Count	23	39	33	4	46
		Percentage of Q25	50.0%	84.8%	71.7%	8.7%	
		Percentage of Q3	16.2%	30.5%	24.4%	10.3%	
Count			142	128	135	39	203

It can be seen that people who use communication software and interest community software are more reluctant to provide address book information in exchange for TikTok's recommendation of contacts related to friends or relatives.

4.2. Correlation Analysis with Nominal Single Choice Questions

The dependent variable is defined as questions 24-27, the user is willing to provide partial access to TikTok to get better service, and the rest as independent variables, using cross-tabulation chi-square test (See Table 10).

Table 10: Correlation analysis with nominal single choice questions.

Significance / Question	Q24	Q25	Q26	Q27
Q22	0.558	0.822	0.609	0.578

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4.3. Correlation Analysis with Ordered Single Choice Questions

The dependent variable is defined as questions 24-27, whether users are willing to provide partial access to TikTok to get better service, and the rest are independent variables, using Spearman correlation analysis (See Table 11).

Table 11: Correlation analysis with ordered single choice questions.

Significance / Question	Q24	Q25	Q26	Q27
Q12	0.233**	0.225**	0.095	0.131

** indicates significant correlation at the 0.01 level (two-tailed).

It is evident that the length of time using TikTok is significantly and positively correlated with the willingness to grant cell phone microphone access in exchange for TikTok gathering recorded content to identify users' shopping needs and the willingness to grant address book information in exchange for TikTok recommending contacts related to users' friends or relatives.

4.4. Correlation Analysis with Scales

The dependent variable is defined as questions 24-27, the users were willing to provide partial access to TikTok for better service, and the rest were independent variables, using Pearson correlation analysis (See Table 12).

Table 12: Correlation analysis with scales.

	Q13	Q14	Q15	Q16	Q17	Q18	Q22	Q23	Q24	Q25	Q26	Q27
Q13	1	.416**	.235**	.225**	.369**	-.017	-.287**	-.158*	.203**	.191**	.141*	.115
Q14		1	.129	.117	.241**	.124	-.056	.023	.177**	.036	.042	.083
Q15			1	.420**	.329**	.007	-.184**	-.159*	.262**	.431**	.297**	.224**
Q16				1	.266**	.016	-.009	-.067	.356**	.405**	.265**	.186**
Q17					1	.051	-.031	.005	.235**	.200**	.165*	.121
Q18						1	.284**	.387**	-.033	-.089	-.032	.080
Q22							1	.614**	-.044	-.179**	-.027	-.040
Q23								1	.015	-.182**	-.021	-.019
Q24									1	.451**	.371**	.436**
Q25										1	.492**	.454**
Q26											1	.443**
Q27												1

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**. At the 0.01 level (two-tailed), the correlation is significant.
*. At the 0.05 level (two-tailed), the correlation is significant.

As can be seen, the vast majority of the data are significantly correlated with each other. Questions 13-17 are positively correlated with the willingness to provide cell phone microphone access in exchange for TikTok's ability to collect recorded content to identify users' shopping needs; questions 13 and 15-17 are positively correlated with the willingness to provide address book information in exchange for TikTok's ability to recommend contacts related to users' friends or relatives, and questions 22-23 are negatively correlated with the willingness to provide address book information in exchange for TikTok's ability to recommend contacts related to users' friends or relatives. Questions 13 and 15-17 are positively correlated with the willingness to provide browsing history in exchange for TikTok recommending media content that better matches users' tastes; questions 15-26 are positively correlated with the willingness to provide information about installed applications in exchange for TikTok pushing information about products that users are interested in and jumping directly to third-party platforms for purchase.

It can be summarized that users' agreement with TikTok's permissions and perceptions of access correlate with their willingness to provide partial permissions for improved services.

5. Cluster Analysis

Using K-means clustering analysis, after trying 2-6 numbers of clusters, study found that 3 classes were the best and most representative, so three classes were selected.

1 - People who do not agree to give privacy permissions in exchange for better services

2 - people who agree to give privacy rights in exchange for better services

3 - People who give privacy rights in exchange for better services depending on the situation

Actually, most of the preferences and views on TikTok permissions are consistent among those in category 2 - those who agree to give privacy permissions in exchange for better service and those in category 3 - depending on the situation to give privacy permissions in exchange for better service, and those in category 1 - those who do not agree to give privacy permissions in exchange for better service are significantly different from these two categories (See Table 13).

Table 13: Number of cases in each cluster.

Cluster	1	80.000
	2	60.000
	3	76.000
Valid		216.000
Absence		0.000

It can be seen that the number of people in the three categories is basically similar, and the proportion is similar. All of them are around 60 to 80 people (See Figure 1).

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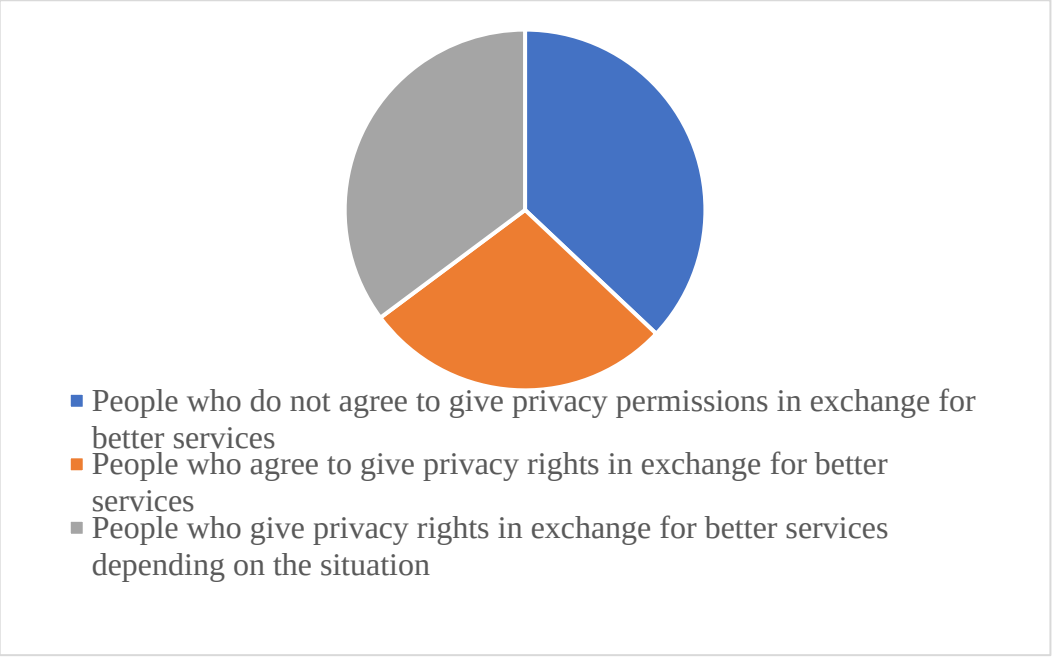

Figure 1: Overall analysis of the clustered population.

6. Conclusion

The conclusion consists of two parts: analysis of data results at demographic, use preference, cognitive, and overall demographic levels. The conclusion of the first part shows that people of different genders and different age groups have different awareness of their own privacy protection, and their attitudes towards privacy agreements are significantly different. On this basis, the number of users who are willing to license software rights is roughly the same as the number who are unwilling to license software rights. Based on the data, the public has a certain sense of protection of personal privacy, but people of different ages will show different protection responses.

This study is based on the primary data collected from the questionnaire survey, and 216 questionnaire results have passed the reliability test. However, questionnaires from respondents of different age groups were not collected in equal numbers during the questionnaire distribution stage, resulting in insufficient prevalence of original data. And because the total number of references in this paper is limited, it is impossible to comprehensively analyze and summarize users' cognition of media platform privacy policies. In future studies, the authors will pay more attention to the development situation of social media and users' attitudes and establish a model to help modify the privacy clauses of media platforms, so that users can obtain better services in using social media.

Authors Contribution

All the authors contributed equally, and their names were listed in alphabetical order.

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