

## RESEARCH ON THE USER BEHAVIOR OF LIVE STREAMING SPORTS VIDEOS

**YU FAN**

Deputy Dean of the Department of Business Administration, Business School, Lingnan Normal University, Zhanjiang, Guangdong; Guangdong Coastal Economic Belt Development Research Center, Lingnan Normal University, Zhanjiang Guangdong, China. Email: fanyu223311@126.com

**BANG NGUYEN**

Doctorate Student, Department of Sport Management, National Taiwan University of Sport, Taichung, Taiwan / Department of Facilities Management, Ton Duc Thang University, Ho Chi Minh City, Vietnam.  
Email: nguyembang@tdtu.edu.vn

**KEMO BADIANE**

Associate Professor, Nanfang College - Guangzhou, Wenquan Town, Conghua District, Guangzhou, China.  
Corresponding Author Email: didibadiane@gmail.com

### Abstract

The purpose of this study is to predict the behaviour of sports video users as an entry point to predict the behaviour of the participants watching sports videos. It is used to predict and explain individual behaviour, effectively explain the reasons why people participate or not in online sports activities, and to a certain extent, predict the behaviour of actors. This study uses intentional sampling method to select students who like watching videos to exercise. Snowball sampling method was also used to select 14 college students. It is estimated that 420 questionnaires were collected in total, but 405 were recovered with a recovery rate of 96.4%. After excluding 48 invalid questionnaires, 356 valid questionnaires were obtained, with an effective rate of 87.9%. The findings show that most of the sports videos (1) are watched by women, mainly in the fourth grade. (2) They watched more than five times a week for more than 40 minutes. (3) Viewing behavioural attitude (BA)/behavioural intention (BI) has the highest predictive power on user behaviour (UB).

**Keywords:** Sports Videos, Theory of Planned Behaviour (TPB), User Behaviour (UB), Live Streaming

### INTRODUCTION

With the emergence of smartphones and the era of the Internet, Sina Sports APP. began publishing a large number of sports-related videos and attracted many sports fans because of its various functions (Duan et al., 2023; Zhou, Wang, & Breedlove, 2021; Lin et al., 2022), which can be broadcasted live or watched anytime and anywhere (see below watch video for short), so it can give users a convenient and fast way to enjoy the fun of sports at the same time, and also gives advertisers a marketing platform under the development of the Internet. Sina Sports has become the No.1 sports video giant in China. The platforms and websites publishing sports videos are mainly developed by advertisers and developers of mobile terminals. Later, more platforms and websites followed suit in earning money from the mobile terminals. Many original sports videos will continue to grow under the influence of new media and have their own place (Wang, 2015). Now, everyone is a self-media, who can make their own videos and post and share them (Sun, & Yu, 2023; Ferrari, Diana, & Tan, 2023; Zhang, 2023). It can easily

be argued that "Internet celebrities" are half of the public figures on video new media apps such as Xiaohuo or Douyin. People can use fragmented time to relieve stress or exercise at home without leaving home. Online video services have become an important part of people's lives (Wang, 2015). In today's society, the dissemination of sports news information through mobile media as an intermediate has a positive impact on students' participation in physical exercise, and it is very common for students to use smartphones. The dissemination of sports news and information on smartphones helps promote participation in sports behaviour. It appears that students' physical exercise behaviour is closely related to sports news and information disseminated by mobile media (An, 2017). Through the Internet, we continue to expand what we see and hear. Sports games can be played by videos to make the whole world immersive, so that more people can enjoy professional fitness guidance in the gym, at home and make students' sports life more convenient. Rich and colourful, sports videos bring more possibilities to people's sports life, continuously improve the awareness of lifelong sports, and promote the development of national fitness requirements.

The Theory of Planned Behaviour (TPB) was developed to predict and explain behaviour across a wide range of different types of behaviours or a person's intention level to engage in a specific behaviour (Jose, & Sia, 2022; Ali, Nakayama, & Yamaguchi, 2023). In this research, the TPB model was used to predict students' use of sports videos. There have been many studies using TPB to predict behaviours (Sheng et al., 1999 ; Xu, 2012 ; Zhu, 2017), but most of the research on watching sports videos is in teaching area, that is, learning behaviours by watching videos, analysing the advantages and disadvantages of live sports videos, watching videos, and sharing them to promote the dissemination of sports news and information. At the same time, none of these studies used the TPB model. In this study, based on the results of scholars' research on sports behaviour, the TPB model is used to predict behavioural studies on watching videos. This study used the TPB model to analyse and forecast behavioural research on watching videos based on the results of scholars' research on sports behaviour.

The purpose of this research is to predict the behaviour of students watching sports videos, including behavioural attitude (BA), subjective norm (SN), and perceived behavioural control (PBC), behavioural intention (BI). More specifically, this study tries to understand whether there are any significant differences among students with different backgrounds in their actions in videos watching. The remainder of the paper is structured as follows. In chapter 2, we briefly describe the literature review. In chapter 3, we develop the research methods. Chapter 4 presents the results and discussion of the study. Finally, chapter 5 provides conclusions and recommendations for future research.

## LITERATURE REVIEW

### Sports Video Research

Zhao and Zhang (2009) made a brief introduction to the status quo of China's online video websites. In China, sports video websites began competing during the Beijing Olympic Games, and they divided China's online sports video websites into four types. Under the unique charm of sports, it has become an important communication content of mass media, which is also an

important demand for mass netizens. The proportion of watching online sports videos occupies the first place. As research, and based on the characteristics of optical flow, a new low-resolution video human action recognition algorithm is proposed to improve the overall performance of sports video recognition technology (Yang, 2018). Shi et al., (2017) proposed sports video research on key frame extraction in the local spatiotemporal features in the video teaching mode.

In the era of using sports videos to correct wrong movements, teachers need to predict students' movement trajectories and trends in sports videos, so the key to sports videos frame extraction is very important, which will affect the correctness of the human body's expressive actions. Hu and Yang (2008) proposed to use the method of sports video to analyse movements in order to improve the quality of physical education teaching and transform the traditional language-based teaching into visual video-based teaching, which will help athletes learn skills better and understand movement skills faster and practice more effective movement technique. The establishment of a sports video database will greatly improve the quality of physical education and break the traditional teaching, while promoting the development of national fitness movement. Shan (2015) explored the adversity and solutions of online sports videos. In today's Internet era, people can choose relevant sports information according to their own needs. Online sports videos are more convenient and durable to receive information. It is convenient for people to view the information they need anytime and anywhere. Research has shown that online sports videos are a combination of the Internet and sports-related programs combined and disseminated.

Definition of sports video: In the context of the information age, the use of multimedia technology in teaching has broken the traditional physical education teaching. Sports require the cooperation between the various parts of the body and sports video can help us watch the details of each action more intuitively (Fu, & Wang, 2022; Tang, & Hyun-Joo, 2022). Physical education and training are of great help. Sport video is an audio-visual program that is produced, edited, and synthesized, and then displayed to the public to watch and share through the Internet (Zhao, 2009).

Sports videos can also create a very strong live feeling for sports video viewers through visual and intuitive video methods (Wu & Xu, 2016). In educational field, teachers or coaches can demonstrate and record videos on smartphones to carry out independent learning. On the other hand, we can also record videos by ourselves to observe our own deficiencies and make comparisons and corrections. With the help of videos, students can better promote flexibility. To mobilize study time, you can also share resources on smartphones, watch more videos, and improve students' awareness of physical exercise (Zhou, 2015).

### **Theory of Planned Behaviour (TPB)**

TPB was first proposed by Icek Ajzen in 1985, and it was also developed from the theory of rational behaviour. This theory believes that the actual behaviour of individuals will be indirectly affected by behavioural attitude (BA), subjective norm (SN), perceived behavioural control (PBC), and behavioural intention (BI) (Li, 2019).

The TPB model has been widely used in many fields, including sports, and there are studies to predict the development of future behaviours, and many research findings show that the TPB model can improve the interpretation and prediction of some individuals' behaviours. TPB model has been proven in the field of sports. It can effectively explain the reasons why people participate in or not in sports activities and can also effectively predict the sports behaviour of actors to a certain extent. Yang et al. (2016) used the existing TPB model to effectively explain and predict individual exercise behaviours from different perspectives and analysed the process of promoting exercise behaviour. The behaviour uses the five dimensions of the TPB model to collect data, and finally employs statistical methods to draw the conclusion that PBC and SN have a more obvious impact on youth football participation BI, while participation attitude has a weaker influence on youth football participation BI. BI and PBC have predictive effect on youth football participation behaviour. Based on the above results, the researcher also put forward suggestions on campus football from the perspective of TPB: at the micro level, we should shift from changing youth participation attitude to changing their SN and perceptual control (Li, 2019).

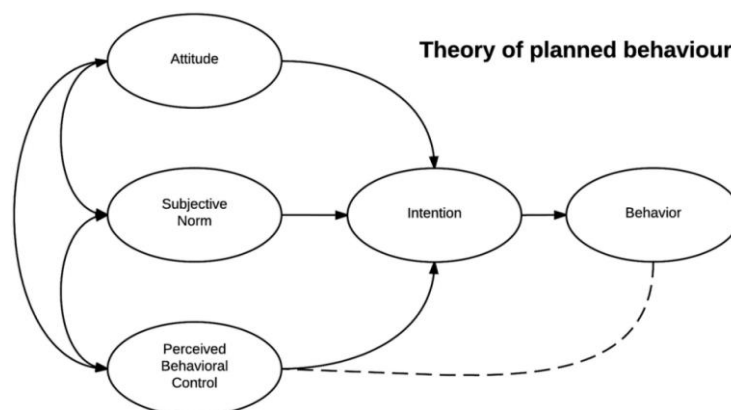
Xiang (2016)) created an analysis framework based on the TPB model, divided the exercise behaviour and intention of the students in the fourth grade of primary school into a control group and an experimental group for intervention, and carried out a series of intervention methods to help students better complete exercise behaviour. The result is that the exercise level and the duration of physical exercise behaviour of the experimental group under the intervention effect are significantly improved, and the exercise intention of the experimental group is also comparatively higher. Qiu and Yang (2017) used the five dimensions of TPB to conduct research and found that the positive degree of BA could be affected by the surrounding environment and whether the individual's motivation to overcome difficulties is strong enough. The stronger the individual's BI, the higher the possibility of UB.

To conclude, there are many studies in sports based on the prediction and interpretation of group or individual behaviour on TPB, and some suggestions can be given from different angles of TPB. In sports, most of them study the prediction and interpretation of exercise behaviour or in school football. For the time being, no scholars have been found to explain and predict the behaviour of watching sports videos from different angles of TPB. In this research, based on TPB, some operable suggestions are put forward to explain and predict the behaviour of watching videos in schools, promoting the teaching of watching videos, improving students' lifelong sports awareness, and at the same time enabling students to better improve their physical fitness and overcoming difficulties, enriching students' life and physical and mental health development and promoting the balanced development of the school in all aspects of morality, intelligence, physical education, art and labour.

## RESEARCH METHODS

### Research Framework

This study is based on the TPB model for students watching videos as personal behaviour. This model includes Behavioural Attitude (BA), Subjective Norm (SN), Perceived Behavioural Control (PBC), Behavioural Intention (BI) and UB (UB) as exhibited in Figure 1.



**Figure 1: TPB Framework for Watching the Videos**

### Research Tools

The design of the questionnaire in this study is based on the five dimensions of TPB with reference to research (Lian & Tang, 2019; Wang & Che, 2019 ; Xie et al., 2019 ; Wang et al., 2019) using a self-compiled scale and building 20 measurements: BA (4 items), SN (4 items), PBC (4 items), BI (4 items), UB (4 items). The closed ended questionnaires consist of the following two parts: The first part is composed of the five basic dimensions of TPB, while the second part consists of the demographic information of the participants. According to the actual situation of the school and some reference documents: Yang et al. (2014), Liu and Pan (2009) self-compiled the items, including gender, college, grade, video watching times/week, time/day, exercise frequency/week, exercise duration minute/time, when to watch videos and viewing channels, and which way to watch it.

### Research Object

This study uses intentional sampling method to select Lingnan Normal University students who watch videos for exercise. To ensure the representativeness of the research sample, snowball sampling method was used to select students from 14 colleges in the school, and 356 valid questionnaires were collected.

### Analysis of the Pre-Test Questionnaire

Item analysis: The research questionnaire adopts item analysis to revise test items, so as to evaluate and screen the quality of the items, choose to eliminate obvious irrelevant items while keeping most potentially relevant items (Wu, 2019). Watching the video of this research

questionnaire includes 4 items of BA, 4 items of SN, 4 items of PBC, 4 items of BI, and 4 items of UB, totalling 20 items using a five-point Likert scale ranging from “Strongly agree” to “Strongly disagree”. The scale is designed and filled in accordance with the actual feelings of the subjects. The scoring method of the scale is divided into 5 levels. The higher the score, the higher the value of the subjects at this level, and the higher the total score of each level, the more positive to watch the video.

For this study, the  $\alpha$  reliability coefficient method in the reliability analysis is mainly used. Generally, the Cronbach's  $\alpha$  coefficient of the questionnaire is above .8, which has research value. The distribution range of the Cronbach's  $\alpha$  coefficient of the reliability of the questionnaire indicates that .70—.80 shows good internal consistency, .60—.70 indicates an acceptable level of reliability, and below .60 is unacceptable (Wu, 2019). The internal consistency reliability of this study Cronbach's  $\alpha$  is .852 for BA, .862 for SN, .843 for PBC, .859 for BI, and .882 for UB as shown in **Table 1**. Cronbach's  $\alpha$  is higher than .80, so the scale of this study proved to have good internal consistency.

**Table 1: Item Analysis and Reliability Analysis**

Variables	Items	Cronbach $\alpha$	TT Items	T test	Remark
BA	BA1	.852	.680	-18.141*	Reserve
	BA2		.766	-16.630*	
	BA3		.729	-16.641*	
	BA4		.620	-14.464*	
SN	SN1	.862	.737	-11.383*	Reserve
	SN2		.711	-12.874*	
	SN3		.742	-12.191*	
	SN4		.672	-12.987*	
PBC	PBC1	.843	.660	-14.407*	Reserve
	PBC2		.745	-14.426*	
	PBC3		.693	-12.763*	
	PBC		.629	-10.729*	
BI	BI1	.859	.692	-13.621*	Reserve
	BI2		.665	-16.133*	
	BI3		.737	-12.994*	
	BI4		.743	-14.826*	
UB		.882	.733	16.157*	Reserve
			.694	-16.136*	
			.788	-13.947*	
			.771	-14,899*	
*p < .05					

### Formal Questionnaire

As of March 7<sup>th</sup>, 2022, a total of 405 questionnaires were collected in this study, and 420 are expected to be collected, with a recovery rate of 96.4%. There are a total of 48 invalid questionnaires. There are 48 questionnaires with the same IP address. After deleting invalid questionnaires, it remains a total of 356 valid questionnaires, with an effective rate of 87.9% as shown in **Table 2**.

**Table 2: Formal Questionnaire Distribution and Return Form**

Estimated No.	Recovered No	Recovery %	Valid	Invalid	Efficient %
420	405	96.4%	356	48	87.9%

### Data Analysis Method

This study uses SPSS 22.0 to analyse the data collected through the questionnaire, and the analysis method used is divided into two parts as described below:

#### Pre-Test Questionnaire:

**Item Analysis:** refers to the analysis and research on the quality of the items of the scale, which is to analyse the items in the scale to evaluate the quality of the items and then select the items, choose to eliminate, or retain it (Wu, 2019).

**Reliability:** It refers to the consistency and stability of the measured results. This study will use the  $\alpha$  reliability coefficient method in the reliability analysis. Generally, the Cronbach's  $\alpha$  coefficient of the questionnaire is above .8, which has research value. The internal distribution of the Cronbach's  $\alpha$  coefficient of the reliability of the scale questionnaire indicates that 70—.80 means good, .70—.60 is acceptable, and below .60 is unacceptable (Wu, 2019).

#### Formal Questionnaire:

**Descriptive Analysis:** In the study, this analysis method can analyse the basic information of students to understand the demographic information of the sample.

**Regression Analysis:** This study uses linear regression analysis in regression analysis, that is, dependent variables and independent variables there is a linear relationship between the variables, and the quantitative dependence between the two variables can be obtained through this analysis (Wu, 2019).

## RESULTS AND DISCUSSION

### Demographic Data Analysis

In the sample population of this study, except for the number of students in the School of Physical Education, which reached 31.5%, the number of respondents from other colleges is not far behind. The ratio of male to female in the school is 3:7. Up to 65.7%. The number of respondents ranged from 14% in the first year, 22% in the second year, 27.8% in the third year, and 36% in the fourth year as exhibited in **Table 3**.

**Table 3: Demographic Information**

Variable	Frequency	%	Variable	Frequency	%
Gender	356	100.0	College (code)	356	100.0
Male	122	34.3	SAM	23	6.5
Female	234	65.7	SFLP	34	9.6
Grade	356	100.0	SFL	17	4.8
Freshman	50	14.0	SES	19	5.3
Sophomore	79	22.2	SIE	17	4.8

Junior	99	27.8	SMS	16	4.5
Senior	128	36.0	SCCE	13	3.7
			SMEE	13	3.7
			SPST	25	7.0
			SB	20	5.6
			SSS	112	31.5
			SRD	21	6.2
			SMD	12	3.4
			SLST	13	3.7

Among the subjects in this research, 33% of them watch videos at any time, and 8% watch sports videos during lunch break and on the way from school/get off work. Even after getting up, before going to bed at night, and during study/work, watching videos has become an essential part of students' life. During the day, it is possible to watch videos at anytime and anywhere. For students, it can help them reduce stress and learn sports knowledge, which can bring them spiritual pleasure and skill learning. When it comes to watching videos, Douyin ranks first, accounting for 54.2%, followed by others 46.6% and Weibo 44.1%. From the data, it is found that the Douyin APP is very popular among students. The video time of this type of APP is short, and it can be flexibly adjusted according to the personal time. Other options include website platforms such as Xiaohongshu, Bilibili and some other sports platforms. There are many ways to watch videos, and each student can find a way to watch videos that suit his/her own characteristics according to his/her needs as shown in **Table 4**.

**Table 4: Watch Video Time and Channel Statistics**

Variable	Frequency	%	Variable	Frequency	%
<b>Watch time</b>					
Morning	46	12.9	After school	40	11.2
Lunch break	44	12.4	before bedtime	87	24.4
Study break	133	37.4	at any time	176	49.4
<b>Viewing path</b>					
Tújìng dǒu yīn	193	54.2	Tújìng huǒshān	9	2.5
Miaopai	31	8.7	Tújìng kuàishǒu	35	9.8
Weibo	157	44.1	Tújìng YY	4	1.1
Meipai	12	3.4	Xiaokaxiu	3	.8
Official	126	35.4	Others	166	46.6

## Differences between Different Population Backgrounds and Variables

### Item Analysis and Review

In this study, 20 items were analysed through descriptive statistics, and then the averages were sorted by Excel. From **Table 5**, we can know that the two items with the lowest average are: "I use sports videos because my family members influence me", and "I use sports videos because my family members recommend them to me", which means that the influence of my family members on watching videos is very low.



**Table 5: TPB Items**

Items	Average	Standard Deviation	Items	Average	Standard Deviation
Q1	4.079	0.700	Q11	3.815	0.859
Q2	4.073	0.729	Q12	3.767	0.862
Q3	4.034	0.730	Q13	3.753	0.873
Q4	4.031	0.744	Q14	3.742	0.875
Q5	4.014	0.750	Q15	3.733	0.877
Q6	4.008	0.762	Q16	3.730	0.889
Q7	4.008	0.775	Q17	3.683	0.898
Q8	3.997	0.778	Q18	3.447	0.934
Q9	3.969	0.813	Q19	3.278	1.061
Q10	3.938	0.850	Q20	3.261	1.073

The 5 major variables: BA, SN, PBC, BI, and UB /sub-items are the detailed items under the subject item

### Gender

After the results of the independent sample t-test as shown in **Table 6**, it was found that in the analysis of gender, "BA" (T=0.087\*, p<.05), "SN" (T=0.001, p<.05), "PBC" (T=0.423, p<.05), "BI" (T=0.010, p<.05), and "Use Behaviour" (T=0.148, p<.05) all reached significant differences. And in terms of "BA", "SN", "PBC", "BI", and "UB", the average number of boys is higher than that of girls.

**Table 6: Gender Samples T-test Difference Analysis**

Variables	Gender	Samples No.	Average	Standard Deviation	T-value
BA	Male	122	4.209	.691	.087*
	Female	234	3.774	.616	
SN	Male	122	3.772	.913	.001*
	Female	234	3.370	.729	
PBC	Male	122	4.002	.745	.423*
	Female	234	3.573	.647	
BI	Male	122	4.139	.708	.010*
	Female	234	3.866	.594	
UB	Male	122	4.221	.705	.148*
	Female	234	3.850	.648	

\*p < .05

### Grades

The results of this study according to grades (see **Table 7**) show that different grades in "BA" (F=3.042, p<.05), "PBC" (F=5.813, p<.05), "BI" (F=3.705, p<.05), "UB" (F=6.037, p<.05). Except for "SN" which did not have a significant difference in grades, the other four variables with significant differences were compared, and a conclusion was found that the seniors were higher than that of the sophomores, and the juniors were higher than that of the sophomores.

**Table 7: Grades Independent Sample T-test Difference Analysis**

Independent Variables	Grades	Samples No	Average	Standard Deviation	F-value	Scheffe's Post Hoc
BA	A	50	3.865	.759	3.042*	D>B
	B	79	3.750	.647		
	C	99	3.954	.664		
	D	128	4.029	.645		
SN	A	50	3.565	.849	.744	
	B	79	3.389	.756		
	C	99	3.525	.788		
	D	128	3.546	.867		
PBC	A	50	3.615	.768	5.813*	D, C>B
	B	79	3.471	.608		
	C	99	3.790	.696		
	D	128	3.861	.719		
BI	A	50	3.860	.716	3.705*	D>B
	B	79	3.788	.577		
	C	99	4.007	.670		
	D	128	4.068	.623		
UB	A	50	3.880	.747	6.037*	D, C>B
	B	79	3.724	.681		
	C	99	4.073	.695		
	D	128	4.097	.626		

\*p < .05      A: Freshman B: Sophomore C: Junior D: Senior

**Watching Video Times/Week**

According to the research results (see **Table 8**), the number of weekly views: "BA" (F=14.597, p<.05), "SN" (F=5.974, p<.05), "PBC" (F =2.456, p<.05), "BI" (F=15.402, p<.05), and "UB" (F=18.386, p<.05) were compared after the event and it was found that watching videos at least five times a week is the highest, followed by watching videos three or four times a week.

**Table 8: Sample T-test for Watching Video Times/Week**

Independent Variables	Week	Samples No	Average	Standard Deviation	F-value	Scheffe's Post Hoc
BA	A	114	3.660	.630	14.597*	A, B, C C, D>A
	B	81	3.817	.663		
	C	65	3.957	.606		
	D	27	4.203	.661		
	E	69	4.340	.584		
SN	A	114	3.271	.759	5.974*	E, D>A
	B	81	3.493	.765		
	C	65	3.496	.797		
	D	27	3.842	.727		
	E	69	3.797	.909		
PBC	A	114	3.438	.732	2,456*	D>A E>A, B, C
	B	81	3.672	.615		
	C	65	3.730	.622		
	D	27	4.046	.576		

	D	69	4.105	.695		
	E					
BE	A	114	3,679	.697	15,402*	C, D>A E>A, B, C
	B	81	3,870	.560		
	C	65	4,050	.530		
	D	27	4,185	.570		
	E	69	4,355	.546		
UB	A	114	3,664	.687	18,386*	C, D>A E>A, B, C
	B	81	3,864	.572		
	C	65	4,073	.641		
	D	27	4,222	.734		
	E	69	4,442	.540		

\*p <.05 A: 1, B: 2, C: 3 times, D: 4 times, E: More than 5 times

### Time/Day of Watching Videos

According to the results of the study (see **Table 9**), the different viewing time in "BA" (F=7.506, p<.05), "SN" (F=5.323, p<.05), "PBC" (F= 6.548, p<.05), "BI" (F=8.215, p<.05), and "UB" (F=9.662, p<.05) all reached significant differences after post-hoc comparisons, and it can be seen that the daily video watching time  $\geq 41$ -50min,  $\geq 51$ -60 minutes, and above 61 minutes (inclusive) were on average higher than those below 20 minutes (inclusive), and >21-30 minutes. Students watch videos for at least 40 minutes per day.

**Table 9: Time/Day Sample of Watching Video T-test Difference Analysis**

Independent Variables	Day	Sample No	Average	Standard Deviation	F-value	Scheffe's Post Hoc
BA	A	155	3.743	.639	7.506*	C, D>A F>A, B
	B	94	3.901	.664		
	C	58	4.116	.655		
	D	18	4.236	.661		
	E	10	4.075	.635		
	F	21	4.476	.552		
SN	A	155	3.321	.782	5.323*	D, F>A
	B	94	3.518	.828		
	C	58	3.659	.687		
	D	18	4.111	.763		
	E	10	3.500	.772		
	F	21	3.916	1.019		
PBC	A	155	3.554	.697	6.548*	D>A F>A, B
	B	94	3.718	.654		
	C	58	3.827	.637		
	D	18	4.097	.753		
	E	10	3.725	.877		
	F	21	4.333	.699		
BI	A	155	3.738	.679	8.215*	B, C, D, E>A
	B	94	4.039	.573		
	C	58	4.146	.544		
	D	18	4.222	.652		
	E	10	4.225	.398		
	F	21	4.369	.556		
UB	A	155	3.740	.673	9.662*	C, D>A

	B	94	4.016	.618		F>A, B
	C	58	4.228	.603		
	D	18	4.277	.844		
	E	10	4.175	.656		
	F	21	4.511	.567		

\*p < .05 A: Less than 20 min (inclusive) B: > 21 - 30 min C: ≥31 - 40min

D: ≥41 - 50 min E: ≥51 - 60min F: 61min (inclusive) or more

### Exercise Frequency/Week

According to the research results as shown in **Table 10**, different exercise frequencies are different in BA (F=6.342, p<.05), "PBC" (F=6.437, p<.05), BI (F=7.498, p<.05) and "UB" (F=10.172, p<.05) were significantly different variables. After the post-hoc comparison, SN did not reach a significant difference, and from Table 12 it can be seen that the frequency of exercise is more than five times and four times per week, which are higher than once and twice respectively. In BI and UB, watching videos three to five times a week is higher than once and twice.

**Table 10: Times/Week Independent Sample T-test Difference Analysis**

Independent Variables	Times/Week	Samples No.	Average	Standard Deviation	F-value	Scheffe's Post-Hoc
BA	A	114	3.660	.630	14.597*	E>A, B, C C, D>A
	B	81	3.817	.663		
	C	65	3.957	.606		
	D	27	4.203	.661		
	E	69	4.340	.584		
SN	A	114	3.271	.759	5.974*	E, D>A
	B	81	3.493	.765		
	C	65	3.496	.797		
	D	27	3.842	.727		
	E	69	3.797	.909		
PBC	A	114	3.438	.732	2.456*	D>A E > A, B, C
	B	81	3.672	.615		
	C	65	3.730	.622		
	D	27	4.046	.576		
	E	69	4.105	.695		
BI	A	114	3.679	.697	15.402*	C, D > A E >A, B, C
	B	81	3.870	.560		
	C	65	4.050	.530		
	D	27	4.185	.570		
	E	69	4.355	.546		
UB	A	114	3.664	.687	18.386*	C, D>A E>A, B, C
	B	81	3.864	.572		
	C	65	4.073	.641		
	D	27	4.222	.734		
	E	69	4.442	.540		

\*p < .05 A: 1 time, B: 2 times, C: 3 times, D: 4 times

E: More than 5 times each Exercise Min/Time

According to the research results as displayed in **Table 11**, it can be seen that the duration of each exercise is in the range of BA ( $F=4.561, p<.05$ ), SN ( $F=4.875, p<.05$ ), PBC ( $F=4.394, p<.05$ ), BI ( $F=6.134, p<.05$ ), and UB ( $F=4.212, p<.05$ ) all had significant differences, which shows that each exercise except for SN, the duration is less than 20 minutes (inclusive), > 21 – 30 minutes,  $\geq 31$  – 40 minutes are all higher than 61 minutes (inclusive); in other variables, it is less than 20 min (inclusive), > 21 – 30 min is higher than 61 min (inclusive). To conclude, the duration of each exercise for most students is about 30 minutes.

**Table 11: Difference Analysis of Each Exercise Min. / Time Sample T-test**

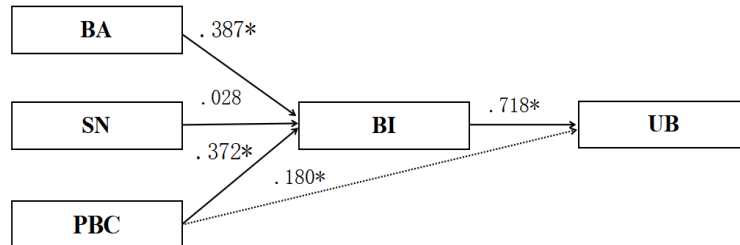
Independent Variables	Min/ Time	Samples No	Average	Standard Deviation	F-value	Scheffe's Post-Hoc
BA	A	85	4.100	.669	4.561*	A,B>F
	B	103	3.970	.665		
	C	71	3.806	.627		
	D	21	4.083	.582		
	E	26	3.960	.565		
	F	50	3.595	.733		
SN	A	85	3.700	.810	4.875*	A, B, D>F
	B	103	3.618	.817		
	C	71	3.366	.780		
	D	21	3.733	.641		
	E	26	3.375	.613		
	F	50	3.115	.891		
PBC	A	85	3.941	.634	4.394*	A, B>F
	B	103	3.793	.710		
	C	71	3.644	.671		
	D	21	3.690	.675		
	E	26	3.500	.741		
	F	50	3.430	.771		
BI	A	85	4.114	.583	6.134*	A, B>F
	B	103	4.099	.669		
	C	71	3.841	.503		
	D	21	4.047	.522		
	E	26	3.846	.659		
	F	50	3,600	.765		
UB	A	85	4.147	.606	4.212*	A, B>F
	B	103	4.048	.720		
	C	71	3.933	.670		
	D	21	4.071	.570		
	E	26	3.846	.583		
	F	50	3.635	.772		

\* $p < .05$  A: Less than 20 min. B: > 21 - 30 min C:  $\geq 31$  - 40 min D:  $\geq 41$  - 50 min.

E:  $\geq 51$  - 60 min F: 61 minutes or more

### Regression Analysis

The research framework of students watching videos has undergone regression analysis, as shown in **Figure 2**.



**Figure 2: Watch Video TPB Mode Framework**

#### Watch Video BA, SN, PBC Predictions for BI

After regression analysis, this study puts in two variables, and the overall explained variation is 50%, among which BA is the largest, which means that BA in watching videos has a greater predictive power on UB as shown in **Table 12**:

**Table 12: Watch Video BA, SN, PBC's Prediction of BI**

Model	Predictor Order	Multivariate Correlation Coefficient R	R-Squared	Adjusted R-Squared	F-value	Standard Regression Coefficient
1	BA SN PBC	.709	.502	.498	118.415*	.387* .028 .372*

\*P < .05 Dependent Variable: BI

#### Prediction of UB by Watching Video PBC and BI

After regression analysis with the two input variables, the overall explained variation is 71%, among which BI is the largest, which means that BI has a greater predictive power on UB in watching videos as shown in **Table 13**.

**Table 13: Watch Video Regression Analysis of Behavior-Based Planning**

Model	Predictor Order	Multivariate Correlation Coefficient R	R squared	Adjusted R-Squared	F-value	Standard Regression Coefficient
1	PBC BI	.844	.713	.711	438.318*	.180* .718*

\*P < .05 Dependent variable: UB.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

#### Current Status of Watching Video Background Information

In the demographic background information, the number of respondents is mostly female, accounting for 65.4%. The grades are mainly senior students, accounting for 36% of the total. The time spent watching videos may account for 33% at any time. Watching videos has already become an indispensable part of students' life. From the data, it can be found that Douyin App. is very popular among students. The video length of this type of APP. is short, and it can be flexibly adjusted according to personal time; every student has found a way to watch videos that suits his/her own characteristics according to his/her own needs.

#### Analysis of Differences in Background Variables in the TPB

Most of the behaviour of students watching videos comes from their own needs, and they learn related fitness knowledge and fitness movement skills (Bulca et al., 2022; Wang et al., 2022). Video movement teaching is intuitive, which is easier for students to accept than classroom language teaching. The behaviour of students watching videos is least affected by family members, but friends and classmates recommend watching videos or introducing individual websites, apps, etc.

In TPB, the average number of males is higher than that of females; the fourth grade is higher than other grades; watching sports video more than five times a week, and the watching time is more than 40 minutes. The frequency of sports is more than five times a week, not less than three times. The duration of exercise is about 30 minutes.

#### Watching Video Based on TPB Predictive Power

Looking at the prediction of BI from BA, SN, and PBC videos, among which BA has the highest predictive power on UB in watching sports videos. Watching video PBC and BI predict UB, among which watching video behaviour intention has the highest predictive power on UB.

### Recommendations

**Grades:** Most of the grades who watch the videos are senior students. After three years of college life, senior students have cultivated a certain awareness of physical exercise in physical education courses, and they are stricter in their own body management. Students in the lower grades pay more attention to the learning of fitness knowledge, motor skills and other related aspects, while freshmen are not used to the school environment when they first entered the school.

**Teaching:** Most of the behaviour of students watching videos comes from their own needs, and they learn related fitness knowledge and fitness movement skills (Lin, Hsia, & Hwang, 2022). The movement video for teaching is intuitive, which is easier for students to accept than language teaching in the classroom. This can explain that multimedia teaching can be used in the classroom, or the recorded movement video can be prepared in advance before class and

sent to the corresponding class for pre-class preview, which is conducive to improving the quality of teaching.

**School atmosphere:** Most of the students benefit from their classmates and friends when they do fitness exercises and learn sports-related knowledge (Woo, & Lee, 2022; Tang, & Chen, 2022). They should enhance the school's sports atmosphere and add fitness equipment and venues. Students majoring in physical education can also promote the school's sports atmosphere and drive friends around them to participate in physical exercise, so that more students can really pay attention to the positive impact of sports on themselves.

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