



What Predicts Chinese Winter Sports Participation Intention Based on an Extended TPB Model: Exploring the Moderating Effects of Traditional Media and Social Media Attention

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Abstract. This study extends the theory of planned behaviour (TPB) by taking media factors into account. Specifically, this study examines the moderating effects of traditional media and social media attention on the relationship between subjective norms, injunctive norms and winter sports participation intention. An online survey was conducted in China ($N = 499$) using convenience sampling. The results indicated that attitude, subjective norms, injunctive norms and perceived behavioural control were positively associated with winter sports participation intention. In addition, both traditional media and social media attention moderate the relationship between subjective norms, injunctive norms and winter sports participation intention. Theoretical and practical contributions are discussed as well.

Keywords: the theory of planned behaviour · injunctive norms · winter sports participation intention · traditional media attention · social media attention

1 Introduction

In 2022, the 24th Olympic Winter Games were successfully held in Beijing and Zhangjiakou, China, which provided a golden opportunity to boost Chinese people's participation in winter sports, including alpine skiing, cross-country skiing, sledging, snow hiking, snowboarding and so on [17]. China has put forward a goal of promoting 300 million Chinese people to participate in winter sports and becoming a leading nation in winter sports. According to the results of a survey conducted by the National Bureau of Statistics and the General Administration of Sport of China, since Beijing was honored to host the 24th Olympic Winter Games, 346 million Chinese people have participated in winter sports, raising the participation rate of residents to 24.56% in China [13].

Boosting participation in winter sports benefits China in several ways. Not only does it improve the health level of Chinese people by encouraging exercise in winter, but it also promotes the development of the winter sports industry, which will contribute substantially to Chinese economic development. However, the growth of winter sports participation rate in China is still not satisfying. The Chinese participation in skiing

experienced a stagnation from 2017 to 2019, remaining at around 13 million people in three years, without significant growth [16]. Since winter sports were just emerging in many parts of China, not many people were familiar with these activities and some were even afraid of the risks and difficulties that hinder participation. Therefore, it is necessary for China to recognise the key factors that can encourage and promote more people to participate in winter sports.

Research has established that TPB is a strong, powerful theory for predicting individuals' intentions, and it is widely used in research fields regarding sports and physical activities [28, 31]. Studies have used TPB to explain people's intention of participating in physical activities or a particular kind of sport, for example, college students in the UK [28] and fencing in Korea [31]. Therefore, we applied the theory of planned behaviour (TPB) as the theoretical framework in this study and explored the variables that predicted winter sports participation intention. To explore the normative influence on behavioural intention, the study also explored how injunctive norms, an extension of TPB, affects winter sport participation.

Previous research regarding TPB neglected the moderating effect of different media platforms attention on the relationship between the normative influences (i.e., norms) and behavioural intention. Media is widely considered as a powerful and promising tool to popularise winter sports in China. According to the statistics provided by the General Administration of Sport of China, during the Olympic Games Beijing 2022, about 600 million Chinese people watched broadcasts and rebroadcasts of the competitions on television, whereas 'Winter Sports 2022' related short video clips on Tik Tok received 164.5 billion recorded plays [12]. Limited research has demonstrated the moderating effects of media attention on the relationship between different kinds of normative beliefs and behavioural intention [14].

The current study closes the research gap by examining how media attention moderates normative influence on winter sports participation intention. For instance, increasing attention to traditional and social media may strengthen the relationship between subjective norms, injunctive norms and winter sports participation intention, because there is typically media representation featuring how different norms shape individuals' intention to participate in winter sports. In summary, the present study aims to a) explore how TPB variables affect winter sports participation intention; b) examine how injunctive norms influence winter sports participation intention; and c) investigate the moderating effects of media attention on the relationship between normative beliefs and winter sports participation intention.

2 Literature Review

The theory of reasoned action (TRA) [5] was developed to predict individuals' possibility to participate in a certain behaviour. According to TRA, behavioural belief and normative beliefs are defined as attitude and subjective norms, respectively. Furthermore, attitude and subjective norms are positively related to individual's behavioural intention. Based on TRA, Ajzen proposed the theory of planned behaviour (TPB) by incorporating a new variable, perceived behavioural control, to deal with conduct over which people have incomplete control [1]. Specifically, TPB, as a powerful theoretical framework for

predicting individuals' behaviour, posits that attitude, subjective norms and perceived behavioural control predict intention to perform various kinds of behaviours with high accuracy [1].

2.1 Winter Sports Participation Intention

According to TPB, behavioural intention can serve as a strong predictor of actual behaviour [1]. It can serve as a proxy for the behaviour [3, 31]. Given this, the study adopted winter sports participation intention to replace actual participation. TPB has been applied in various contexts to predict the intention to participate in different kinds of sports and physical activities [2, 31]. For instance, a study applied TPB constructs to predict university students' sports participation behaviour by conducting a survey of freshmen in a institution of higher education in the UK. Findings highlighted that attitude, subjective norms and PBC can explain 59% of the variance in sports participation intention and 42% in sports participation behaviour [28]. Therefore, the study expected that personal attitude, subjective norms and perceived behavioural control had a positive influence on people's winter sports participation intention.

2.2 Attitude

Attitude has long been recognised as a powerful factor that influences behavioural intention [1, 25]. In this study, attitude can be defined as the degree to which one has a positive or negative feeling towards participating in winter sports [1]. Previous research conducted a survey among 212 first year college students and found that attitude strongly predicted physical activities participation intention [30]. Hence, the study expected that attitude exerted a positive influence on winter sports participation intention. Thus, we propose the first hypothesis.

H1: Attitude is positively associated with winter sports participation intention.

2.3 Subjective Norms

In addition to attitude, one's behaviour is also shaped by social influences (i.e., subjective norms). Normative beliefs can have a significant influence on one's actual behaviour [7]. Subjective norms are defined as 'perceived social pressure to perform or not to perform a certain behavior' [1]. In other words, subjective norms refer to the degree to which one believes important others, such as friends or families, would expect them to participate in winter sports. Previous research has established that subjective norms were positively associated with behavioural intention. For instance, Latimer and Martin conducted a survey of 325 undergraduate students [20]. The results showed that subjective norms were a significant predictor of intentions to do regular exercise. Therefore, the study expected that subjective norms had a positive influence on winter sports participation intention and thus, we propose the second hypothesis.

H2: Subjective norms are positively associated with winter sports participation intention.

2.4 Perceived Behavioural Control

Perceived behavioural control (PBC) refers to people's perceptions of how easy or how difficult it is to perform a certain activity [1] and it explains the significant amount of variance in behavioural intentions [4]. Perceived behavioural control helps explain behaviours by considering individuals' perceptions of their ability to perform behaviours. A previous study involved 395 females in physical fitness programs over a two-month period and demonstrated that perceived behavioural control was a strong predictor of behaviours in the context of exercise and sports [29]. Since participating in winter sports requires resources and opportunities, such as time, money and equipment as well as the physical condition to stay in a cold environment, it is evident that perceived behavioural control has a significant influence on one's participation intention. Therefore, Hypothesis 3 was posited in this study.

H3: Perceived behavioural control is positively associated with winter sports participation intention.

2.5 An Extension of TPB: Injunctive Norms

Generally speaking, social norms are rules and standards that are recognized and followed by members of a group [18]. In addition to subjective norms, another kind of social norms, injunctive norms, also plays an important role in predicting behavioural intention.

Injunctive norms refer to others' approval and disapproval of a certain behaviour perceived by individuals [24]. One is more likely to perform a certain behaviour when perceiving strong social approval. Injunctive norms have been empirically proven to be a predictor of behavioural intention in TPB-related studies. For instance, a study conducted a survey among 63 college students and found that injunctive norms significantly predicted daily changes in intention strength of participating in physical activities [9]. Likewise, to figure out the impact of different normative information, researchers conducted an experiment among 95 recreation volleyball athletes and found that those receiving the injunctive norm message reported greater effort practising volleyball on the team than those receiving the control message [10]. Based on the above literature, this study expected that injunctive norms exerted significant influence on one's intention to do so and proposed Hypothesis 4.

H4: Injunctive norms are positively associated with winter sports participation intention.

2.6 The Moderating Effect of Different Media Attention

Media attention refers to one's efforts to process the particular type of media message and make a corresponding response to it [27]. People use sports media for informational and interactive purposes. Nowadays, in China, both traditional media (e.g., newspapers, magazines, televisions) and social media (e.g., Facebook, Twitter, Weibo, WeChat) provide the audience or users with different kinds of winter sports-related messages including worldwide winter sports events and competitions, timely news of famous winter sports athletes, knowledge and basic skills to perform winter sports and so on.

Previous research has demonstrated mixed results of norm influence on behavioural intention. Most times subjective norms are a successful predictor in a TPB model [28, 31] but they do not always significantly predict behaviours [21]. Ajzen also demonstrated that the results of subjective norms were mixed, and the influence of subjective norms on behavioural intention was weaker than that of attitude and PBC [1]. A possible reason for this phenomenon may be that individuals pay different amounts of attention to media, which results in different normative influences on behavioural intentions. Since media usually conveys normative messages to audiences, like providing them with news or documentaries representing social influence on one's winter sports participation, it can be inferred that media attention may have a moderating effect on the relationship between subjective norms, injunctive norms and winter sports participation intention.

Although many studies consider media attention as an unidimensional construct, different media has different characteristics and should be treated as multidimensional based on different media platforms (i.e., traditional media and social media). For example, social media can differ from traditional media, such as TV and magazines in terms of feedback immediacy and multiplicity of cues [26]. In addition, people use traditional media and social media for different purposes. Clavio and Walsh found that traditional media was primarily used by college sports fans for informational purposes, whereas social media like Twitter and Facebook was mainly used for interactive purposes [8]. However, limited research has examined the moderating effects of individuals' attention to different types of media platforms on normative influence in TPB. Therefore, the current study will test the moderating effects of traditional media attention and social media attention on the relationship between subjective norms, injunctive norms and winter sports participation intention, respectively.

2.7 Traditional Media Attention

Traditional media like television has long been an essential channel through which people watch live sports and acquire information relevant to sports or sports events [11]. For instance, in China, CCTV5, a TV channel focusing on sports, offers timely broadcasts and rebroadcasts of worldwide winter sports events like the Olympic Winter Games, the World Championship of snowboarding and so on, as well as special programs interviewing famous winter sports athletes and documentaries recording their training lives. Han and Cheng conducted an online survey of 550 Chinese residents and found that the traditional media environment information acquisition significantly moderated the relationship between perceived injunctive norms and PEB [14]. Specifically, the interaction between traditional media environment information acquisition and injunctive norms was negatively related to PEB. Therefore, this study focused on examining whether traditional media attention has moderating effects on the relationship between (a) subjective norms, (b) injunctive norms and winter sports participation intention.

RQ1: How does traditional media attention moderate the relationship between subjective norms and winter sports participation intention?

RQ2: How does traditional media attention moderate the relationship between injunctive norms and winter sports participation intention?

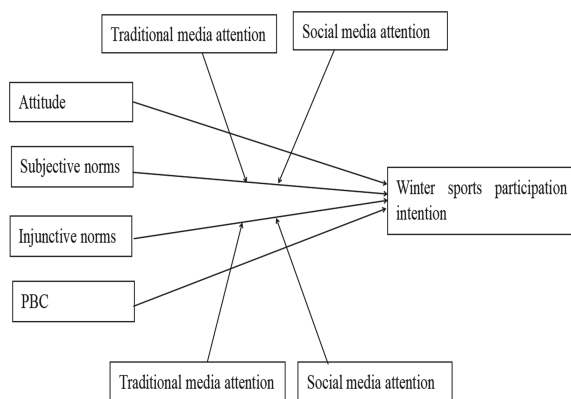


Fig. 1. Conceptual model

2.8 Social Media Attention

Social media refers to persistent channels online for mass personal communication through which users can opportunistically interact and selectively self-present, as well as acquire value from user-generated content and the perceived interaction with others [6]. Many famous Chinese winter sports athletes have their social media account on platforms like Tik Tok or Weibo and usually share their photos, videos of their daily training lives or even conduct live streams, which attract many fans’ attention. Besides athletes, amateurs also share their experience of participating in winter sports on social media, which may attract attention from both friends and strangers.

Han and Cheng found that social media environment information acquisition significantly moderated the relationship between subjective norms and PEB [14]. Specifically, the interaction between social media information acquisition and subjective norms was positively related to PEB. Therefore, the study seeks to examine how social media attention moderates the relationship between (a) subjective norms, (b) injunctive norms and participation intention in a winter sports context (Fig. 1).

RQ3: How does social media attention moderate the relationship between subjective norms and winter sports participation intention?

RQ4: How does social media attention moderate the relationship between injunctive norms and winter sports participation intention?

3 Methods

3.1 Data Collection

This research conducted an online survey to collect data during April 2022 in China. The study employed the snowball-sampling technique to recruit respondents. Specifically, a link to the online questionnaire made on Sojump was sent to respondents through an instant message on WeChat. Respondents were asked to share the link with their WeChat contacts. Before they started to answer the questions, participants were required to give

their consent to participate in this study. Finally, a total of 507 respondents completed the questionnaire in this study. After excluding 8 participants for invalid data, we obtained a valid sample of 499 respondents.

3.2 Sample

Of the 499 respondents, 59.96% of the respondents were female. The mean age was 33 years old ($SD = 13.18$), ranging from 15 to 70 years old. Approximately 81.26% of the respondents had a college degree, whereas the education levels of 5.33% of the respondents were high school and under, and 13.41% of the respondents were post-graduate and higher. The monthly personal incomes of students was calculated by the living expenses provided by parents. The monthly personal incomes of about 4.83% respondents were below 3,000 yuan, whereas 26.23% of respondents were above 10,000 yuan. Those whose personal monthly incomes ranged from 3,000 to 6,000 accounted for 17.55%, while 15.38% reported monthly incomes ranging from 6,000 to 9,000.

3.3 Measures

Control variables. The study used demographic variables including age, gender, education level and monthly personal income as control variables.

Traditional media attention about winter sports. Individuals' attention to traditional media information about winter sports was measured by five items adapted from previous research [15]. Specifically, these messages were measured by requiring respondents to indicate the amount of attention (1 = no attention, 7 = very high attention) they paid to five types of winter sports message on traditional media: winter sports events and relevant programs, information and news about famous winter sports athletes, information about how other people participate in winter sports, ways and methods to participate in winter sports and notes about participating in winter sports, like how to protect one's physical safety ($M = 4.74$, $SD = 1.52$, Cronbach's $\alpha = .953$).

Social media attention about winter sports. Attention to winter sports-related messages on social media was measured by asking the respondents the same five items used to measure traditional media attention while replacing traditional media with social media ($M = 5.56$, $SD = 1.28$, Cronbach's $\alpha = .964$).

Attitude toward winter sports participation. To measure the attitude toward winter sports participation, the study used four items adopted from a previous study [19]. Respondents were required to indicate the degree to which they agree with the items below on a scale from 1 (highly disagree) to 7 (highly agree): "I think that participating in winter sports is (a) pleasant, (b) exciting, (c) entertaining, (d) worthwhile." A higher average score indicates a more positive attitude toward winter sports participation ($M = 5.89$, $SD = 1.08$, Cronbach's $\alpha = .97$).

Subjective norms. Subjective norms about winter sports participation were measured by three items adapted from a prior study [24]. Respondents were required to indicate the degree to which they agree with the statements followed on a scale from 1 (highly disagree) to 7 (highly agree): (a) "Most people who are important to me think that I should participate in winter sports", (b) "Most people whose opinion I value think that I

should participate in winter sports” and (c) “It is expected that I will participate in winter sports” ($M = 4.45$, $SD = 1.55$, Cronbach’s $\alpha = .97$).

Injunctive norms. This section used the same three items as the subjective norms, based on the study conducted by Park and Smith [24]. When measuring injunctive norms about winter sports participation, respondents were required to indicate the degree to which they agree with the statements on a scale from 1 (highly disagree) to 7 (highly agree): (a) “Most people whose opinion I value show approval of my participating in winter sports,” (b) “Most people who are important to me prefer my participating in winter sports,” (c) “Most people who are important to me support that I participate in winter sports” ($M = 4.97$, $SD = 1.43$, Cronbach’s $\alpha = .99$).

Perceived behavioural control. The study used three items adapted from previous research [31] to measure PBC. Respondents were asked to indicate their agreement with the following statements on a scale from 1 (highly disagree) to 7 (highly agree): (a) “I can participate in winter sports at any time I want”, (b) “Whether I participate in winter sports or not depends on myself”, (c) “I have time to participate in winter sports” ($M = 5.09$, $SD = 1.20$, Cronbach’s $\alpha = .78$).

Winter sports participation intention. Winter sports participation intention was measured by three items adapted from previous research [31]. Respondents were required to indicate the degree to which they agree with the items mentioned below on a scale from 1 (highly disagree) to 7 (highly agree): (a) “I intend to participate in winter sports in the future”, (b) “Participating in winter sports is something I plan to do in the future” and (c) “I am willing to spend time and money to participate in winter sports in the future” ($M = 4.82$, $SD = 1.49$, Cronbach’s $\alpha = .94$).

3.4 Analytical Approach

This study used hierarchical ordinary least squares regression analysis in SPSS 25. The study conducted preliminary analysis to explore the correlation between independent variable, moderators, and dependent variables based on Pearson r correlation formula (see Table 1). The Pearson r coefficient represent the extent to which a variable is correlated to the other one variable. If Pearson r coefficient is closed to 1 or -1 , it suggests that two variables are positively or negatively correlated to each other, respectively. Instead, if the coefficients are closed to 0, it represents a weak association between two variables. After that, we analysed one dependent variable--intention to participate in winter sports, four independent variables including attitude, subjective norms, PBC and injunctive norms using hierarchical ordinary least squares regression analysis. Two moderators were traditional media attention and social media attention.

To examine the moderating effects, the interaction terms were created by multiplying the mean-centered independent variables and moderators to reduce multicollinearity. For regression analysis, demographic variables were put in the first block, and the four independent variables were put in the second block. The moderators were put in the third block respectively and the two-way interaction terms were placed in the fourth block.

Table 1. Bivariate correlation of independent variables

	1	2	3	4	5	6
1. Attitude	1	.394**	.501**	.494**	.354**	.527**
2. Subjective norms		1	.706**	.611**	.435**	.371**
3. Injunctive norms			1	.663**	.345**	.428**
4. PBC				1	.314**	.402**
5. Traditional Media Attention					1	.487**
6. Social Media Attention						1

Note. The numbers in column are Pearson r coefficients. ** p < .01

4 Results

Firstly, the preliminary analysis showed that most of variables were significantly and positively associated with each other. Then, the hierarchical regression model demonstrated that gender, education and personal monthly income were not significantly related to winter sports participation intention. Age ($\beta = -.131, p < .05$, see Tables 2 and 3) was found to be negatively related, and the demographic variables explained 3.8% of the variance in winter sports participation intention.

Regarding the TPB variables, attitude ($\beta = .123, p < .00$), subjective norms ($\beta = .306, p < .00$) and PBC ($\beta = .320, p < .00$) were all positively related to winter sports participation intention, which supported H1, H2 and H3. The injunctive norm ($\beta = .192, p < .00$) was also positively related, which supported H4. The TPB block and injunctive norms explained 64.5% of the variance in winter sports participation intention.

$$r = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}} \tag{1}$$

Regarding the moderating effects, the interaction of traditional media attention and subjective norms ($\beta = -.148, p < .001$), and the interaction of traditional media attention and injunctive norms ($\beta = .179, p < .001$) were significantly related to winter sports participation intention, which answered RQ1 and RQ2. In addition, the interaction of social media attention and subjective norms ($\beta = -.109, p < .01$) and the interaction of social media attention and injunctive norms ($\beta = .093, p < .01$) were significantly related to winter sports participation intention, which answered RQ3 and RQ4. Specifically, both traditional media attention and social media attention weakened the relationship between subjective norms and winter sports participation intention. As shown in Figs. 2 and 3, when traditional media attention or social media attention was high, individuals with high subjective norms were less likely to participate in winter sports compared with those who paid less attention to traditional media or social media. Meanwhile, when traditional media attention or social media attention was high, individuals with low subjective norms were more likely to participate in winter sports compared with those who paid only slight attention to traditional media or social media.

Table 2. Hierarchical regression model moderated by traditional media attention

	Model 1	Model 2	Model 3	Model 4
	β	β	β	β
Gender	-.058	-.01	-.01	-.015
Education	-.013	.03	.032	.033
Personal monthly income	-.068	.032	.032	.008
Age	-.131*	-.126**	-.128**	-.103**
$\Delta R^2(\%)$.038			
Attitude		.123***	.121***	.139***
Subjective norms		.306***	.303***	.271***
Injunctive norms		.192***	.192***	.236***
PBC		.32***	.321***	.316***
$\Delta R^2(\%)$.645		
Traditional media attention			.01	-.062
$\Delta R^2(\%)$.645	
Subjective norms * Traditional media attention				-.148***
Injunctive norms * Traditional media attention				.179***
Total $R^2(\%)$.660

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

In addition, both traditional media attention and social media attention strengthened the relationship between injunctive norms and winter sports participation intention. As shown in Figs. 4 and 5, when traditional media attention or social media attention was high, individuals with high injunctive norms were more likely to participate in winter sports compared with those who paid scant attention to traditional media or social media. Meanwhile, when traditional media attention or social media attention was high, individuals with low injunctive norms were less likely to participate in winter sports compared with those who paid less attention to traditional media or social media.

5 Discussion

Overall, our findings supported the TPB variables in predicting behavioural intention in the situation of winter sports participation. In coincidence with previous research [28, 31], our results indicated that attitude, subjective norms, injunctive norms and PBC were positively associated with winter sports participation intention. These results reveal that people are more likely to participate in winter sports when they feel that it is enjoyable and beneficial to do so. Meanwhile, individuals are more likely to participate in winter sports when others expect them to do so or show approval and support of their participation in the collective cultural environment in China. They were also more likely to participate when they perceived strong behavioural control due to the increasing availability of the winter

Table 3. Hierarchical regression model moderated by social media attention

	Model 1	Model 2	Model 3	Model 4
	β	β	β	β
Gender	-.058	-.01	-.014	-.016
Education	-.013	.03	.031	.03
Personal monthly income	-.068	.032	.03	.026
Age	-.131*	-.126**	-.131**	-.13**
$\Delta R^2(\%)$.038			
Attitude		.123***	.098**	.113**
Subjective norms		.306***	.302***	.311***
Injunctive norms		.192***	.182***	.182***
PBC		.32***	.316***	.319***
$\Delta R^2(\%)$.645		
Social media attention			.063	.016
$\Delta R^2(\%)$.648	
Subjective norms * Social media attention				-.109**
Injunctive norms * Social media attention				.093**
Total $R^2(\%)$.653

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

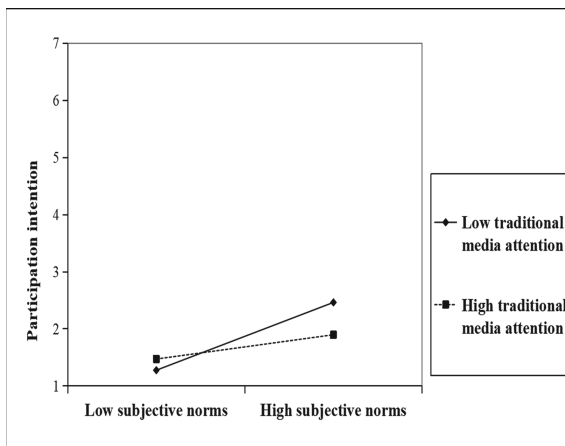


Fig. 2. Participation intention by subjective norms and traditional media attention

sports infrastructure and facilities in China. Furthermore, our findings also indicate that traditional media attention and social media attention moderate the relationship between subjective norms, injunctive norms and winter sports participation intention.

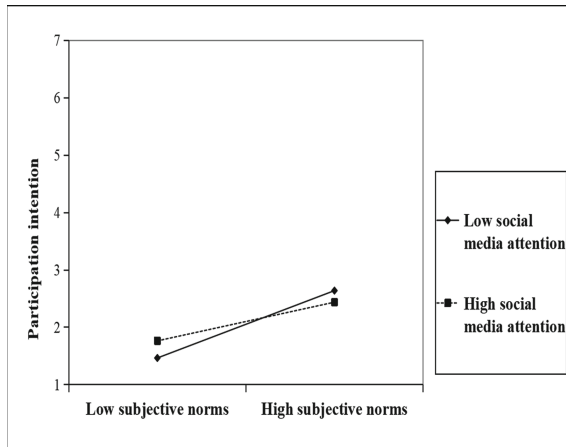


Fig. 3. Participation intention by subjective norms and social media attention

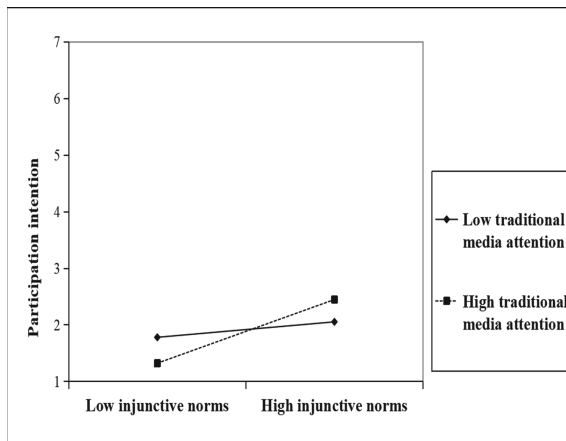


Fig. 4. Participation intention by injunctive norms and traditional media attention

Both traditional media attention and social media attention weakened the relationship between subjective norms and winter sport participation intention. Individuals who paid more attention to traditional and social media were less likely to participate in winter sports when subjective norms were high, compared with those who paid less attention to the two media platforms. One possible explanation is that increasing attention to subjective norms relevant messages on traditional media and social media may give people a sense of social pressure and expectation, which can impede them from participating, especially for those people with high subjective norms. If individuals with a high level of subjective norms pay too much attention to traditional media and social media, they may get tired of the subjective norms messages conveyed by the two media platforms, encounter cognitive overload, and it may even cause cognitive dissonance. This, in turn,

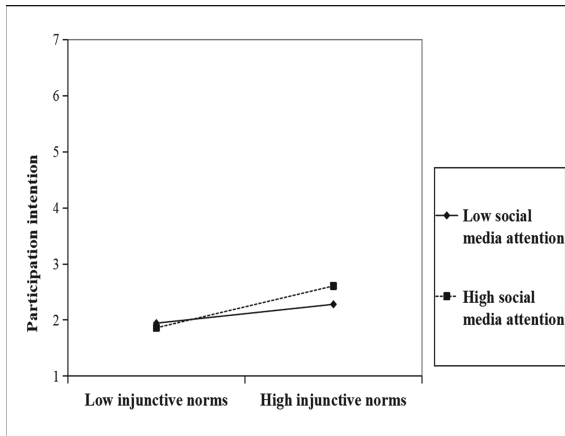


Fig. 5. Participation intention by injunctive norms and social media attention

would arouse psychological reactance [14], thus reducing their intention to participate in winter sports.

The findings also demonstrated that traditional and social media attention strengthened the relationship between injunctive norms and winter sport participation intention. Individuals who paid more attention to these platforms were more likely to participate in winter sports when injunctive norms were high, compared with individuals who paid less attention to them.

This can possibly be explained by the status-conferral function of the media, which is one of the social functions of mass media proposed by Merton and Lazarsfeld [22]. The frequent reports from mass media about athletes or amateurs participating in winter sports would legitimise the social status of winter sports participation. People paying greater attention to traditional media will think it is of great importance to participate in winter sports, which strengthens the influence of injunctive norms on winter sports participation intention.

In the contemporary media environment, social media has become the primary source through which people access news, find news and engage with news [23]. This suggests that the status-conferral function is more pronounced on social media. Therefore, social media plays an important role in legitimising winter sports participation, thus strengthening the positive influence of injunctive norms on such activities.

6 Conclusion

This research has essential theoretical contributions. First, this study extended the application of TPB in predicting winter sports participation. Past research mainly used TPB to predict general physical activities [28, 30] and seldom focused on a specific sports type. The current study tested the validity of the TPB model in the situation of winter sports participation, which is now a hotly discussed issue in China.

Secondly, this study has also extended the TPB model by incorporating injunctive norms, which is another dimension of social norms, and found that it is a strong predictor of winter sports participation intention. Previous research has typically used only subjective norms to predict behavioural intention [28, 31]. This study replicated the relationship between injunctive norms and behavioural intention and provided empirical evidence for the relationship. Notably, the study advanced TPB by taking media factors into account. Specifically, the study explored the moderating effect of media attention on the relationship between the normative influence (i.e., subjective norms and injunctive norms) and behavioural intention.

Furthermore, this research treated media attention as a multidimensional construct. That is, we measured media attention by classifying the construct into two dimensions (i.e., traditional media attention and social media attention) and examined the moderating effects, respectively. The research shed lights on exploring the moderating effects of refined media attention on the normative influence on behavioural intention.

Moving onto practical implications, the study provided useful suggestions for government and media to better encourage and promote winter sports participation in China. The first noteworthy suggestion is that we should attempt to shape a positive public attitude, which in turn could substantially motivate individuals to participate in winter sports. For instance, government and media professionals could utilise different media platforms to guide the public toward establishing a positive attitude. Traditional media and social media can represent the benefits and playfulness of participating in winter sports, which could enhance people's interest in winter sports.

Secondly, strengthening people's perceived behavioural control can encourage them to participate in winter sports. For example, traditional media and social media can show the audience the convenience and simplicity of participating in winter sports to strengthen people's confidence and self-efficacy. Furthermore, it can be inferred that subjective norm information regarding traditional media and social media should be cautiously released or appropriately reduced because too much content in this area on media may generate cognitive overload, causing cognitive dissonance and psychological reactance, which will reduce winter sports participation intention, especially for those with high subjective norms in a country with a strong collective culture. In addition, it may be effective to release messages featuring social approval for winter sports on traditional media and social media. The more approval people perceive from relevant content on traditional media and social media, the more it may reduce their uncertainty and strengthen the positive influence of injunctive norms on winter sports participation intention.

This study has its limitations. First, we used a snowball-sampling method to recruit respondents, and a large percentage of the samples were well-educated university students. It is necessary for future studies to recruit a more representative sample. Second, we did not take respondents' locations into consideration. This factor may exert influence on individuals' winter sports participation. For instance, people from the southern part of China may have fewer opportunities to participate in winter sports compared with those from northern part of China, because there are fewer snow days in the South. Future studies should consider location as a control variable.

In addition, the study only measured winter sports participation intention, which may not completely reflect individuals' real participation actions. Future research can observe the actual behaviours in order to avoid this intention-behaviour gap. Furthermore, the research is based on the context of winter sports participation. In the future, studies can examine the proposed extended TPB model in a wider context, such as pro-environmental behaviours or public health issues.

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