

The Influence Of Autonomous Motivation On Leisure Physical Activity Intention Of Chinese College Students Application Of The Extended Model Of Planned Behavior Theory

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ABSTRAT

Based on the extended theory of planned behavior, this study aims to examine the direct and indirect effects of autonomous motivation, attitude, subjective norms, and perceived behavioral control on the intention of Chinese college students to participate in leisure sports activities. Questionnaire was used as a survey tool to explore the direct influence of autonomous motivation on leisure physical activity intention, and to further understand the mediating effect of attitude, subjective norm and perceived behavioral control between autonomous motivation and leisure physical activity intention. A total of 567 college students from four universities in Yunnan Province, China were selected as a sample. The empirical results of structural equation model show that autonomous motivation has a positive effect on college students' intention to participate in leisure sports activities. The autonomous motivation of college students has a positive impact on their attitude, subjective norms and perceived behavioral control, and then affects their intention to participate in leisure sports activities. At the same time, attitude, subjective norm and perceived behavioral control have mediating effects between autonomous motivation and college students' intention to participate in leisure sports activities. The results of the empirical study verify that the extended theoretical model of planned behavior has good explanatory power. According to the final results of the study, specific suggestions and future research directions on how to improve the intention of leisure time physical activity of college students are put forward.

Keywords: Autonomous motivation; Theory of planned behavior; Attitude; Subjective norm; Perceptual behavioral control; College students' participation intention in leisure sports activities.

Introduction

College stage is an important period for students to form good behavior habits and personality temperament. Active participation in sports

activities will bring corresponding benefits to their physical and mental health (Kevin,2000). In the current college student population, obesity and sub-health rates remain high, and

cardiopulmonary function does not reach the average level for this age group (Van, 2021). In addition, the phenomenon of college students' sub-health caused by lack of physical exercise becomes increasingly aggravated, making the physical and mental health of college students receive much attention (Qiu, 2021). College students' leisure sports activities are behaviors in which students freely choose to participate in different sports activities in their spare time to experience pleasure or fun and further complete self-realization (Gao, 2016). Therefore, to encourage college students to actively participate in leisure sports activities, avoid sedentary, physical fitness, has become a common concern in colleges and universities and the society. Intention reflects the degree of effort participants put into achieving a certain goal, and individual intention is the strongest predictor of behavior (Ajzen, 1991). Intention to participate has received a lot of attention in the literature on motivating adolescents to participate in physical exercise (Teixeira & Palmereira, 2012). The research of Carron and Mack (2006) showed that the intention of students to participate in sports activities can reflect the intensity of their final participation in physical exercise. Therefore, in the research on college students' participation in sports activities during leisure time, college students' participation intention is regarded as an important psychological factor to determine whether they can effectively participate in sports activities.

More and more studies have proposed the importance of motivation in the research on students' sports behavior (Conner, 2003; Hagger, 2012; Simon, 2014), an autonomous form of motivation, has been shown to be significantly correlated with participation in health behaviors

(Silva & Ryan, 2012). Studies have shown that learning behaviors supported by autonomous motivation are effective and conducive to the production of adaptive outcomes in the educational environment, such as the improvement of academic performance and the formation of healthy habits (Flink, Boggiano & Barrett, 2008) and maintenance (Reeve, 2002). Deci & Ryan(2000) proposed that the influencing mechanism of autonomous motivation on the adaptive results of learning and physical exercise intention was effective. Hagger, Chatzisarantis & Barkoukis (2005) found that adolescents' physical exercise motivation had a direct and positive impact on the intention to participate in physical exercise. It can be concluded that autonomous motivation may be the key factor affecting the intention of sports activities in leisure time of college students.

The theory of planned behavior has been supported in studies and meta-analytical reviews of various social behaviors (Deci, 1999; Armitage & Conner, 2001) including exercise and health behaviors (Hagge, 2002; Chatzisarantis, 2003), but with limitations. The theory of planned behavior explains the wide variation in intention and motor behavior, but fails to identify the origin of the core structures that lead to intention, namely attitudes, subjective norms, and perceived behavioral control (Hagger & Chatzisarantis, 2007). Previous studies have attempted to expand, integrate and apply the theory of planned behavior, and to add other factors to study and how these factors affect behavioral intention (Chatzisarantis, 2007). Hagger(2015) developed an extended theoretical model that combines the theory of planned behavior with motivation. This model is unique in that it provides an example of how, in the

context of targeting physical activity participation, Motivation can mediate the intention to exercise through the three variables of self-determination theory (Hagger & Chatzisarantis, 2007).

To sum up, this study will be autonomous motivation theory of planned behavior model, the formation of extension theory of planned behavior model, discusses college students' autonomous motivation of leisure sports activities directly affect the intention, and learn more about college students' attitude, subjective norm, perceived behavioral control between autonomous motivation and intention in leisure sports activities of the mediation effect; According to the results of the final research, specific suggestions on how to improve the intention of leisure time physical activity of college students and the direction of future research are put forward.

The components of the extended Theory of Planned Behavior

In the theoretical model of planned behavior, Ajzen (1991) believes that attitude, subjective norms and perceived behavioral control jointly affect a person's behavioral intention. The main underlying assumption of theoretical models of planned behavior is that most of the actions people engage in are under their control and rational. Moreover, the determinant of a person's actual behavior is behavioral propensity, that is, behavioral intention.

Attitude refers to an individual's positive or negative feelings towards the behavior, that is, the attitude formed after the conceptualization of the individual's evaluation of the specific behavior. Therefore, the components of attitude are often regarded as a function of the

individual's significant belief in the result of the behavior (Xu & Li, 2008). Subjective norms refer to the social pressure felt by individuals on whether to adopt a certain behavior, that is, the influence of individuals or groups that have influence on individual behavior decisions on whether to adopt a certain behavior when predicting others' behavior (Bsen, 2018). Perceived behavioral control refers to the obstacles that reflect an individual's past experience and expectations. The more resources and opportunities an individual thinks he has and the less obstacles he expects, the stronger his perceived behavioral control over his behavior will be. There are two ways of its influence. One is that it has the motivational meaning to the behavioral intention. Second, it can also directly predict behavior (Ajzen, 1995). Attitudes, subjective norms, and perceived behavioral control reflect the underlying beliefs people hold about behavior. The theoretical model of planned behavior uses the above three factors (attitude, subjective norm and perceived behavioral control) to predict individual behavioral intentions.

A study based on autonomous motivation (Rodegers, 2004) found that autonomous motivation can directly predict people's intention of physical activity behavior. In various studies on motivation and intention for physical activity, many factors such as internal value systems, beliefs, perceptions, and voluntary processes have been defined as the internal basis for making certain decisions, such as abandoning unhealthy habits and developing and implementing healthy habits (Hamilton, 2019). This internal and non-stressful motivation is called autonomic motivation, which enables individuals to experience a sense of competence, relationship and autonomy (Deciel, 2008) and

can improve the social cognitive decision-making process of individuals to perform physical activities (Wite, 2010). Therefore, in addition to the three components in the theoretical model of planned behavior, autonomous motivation should also be included in the model.

The antecedents and consequences of the extended Theory of Planned Behavior model

Autonomic motivation This intrinsic tendency to actively develop skills, engage in challenges, and be interested in new activities is true even in the absence of external incentives or rewards (Ryan, & Deci, 2007). Autonomous motivation has been found to be the strongest predictor of sustained exercise. Therefore, this study will refer to Deci and Ryan(2000); Teixeira (2012) defined autonomous motivation as college students' sense of personal choice and autonomy when taking action on leisure sports activities. Rodegers (2014) found in his research on students' non-native language learning based on autonomous motivation that autonomous motivation can directly predict students' intention to participate in courses. A study on student participation based on autonomous motivation (Ryan, 2016) found that autonomous motivation can directly predict people's intention of physical activity behavior. Previous studies in the field of physical activity revealed the link between autonomous motivation and intention to participate in physical activity (Hagger, 2002; Wilson & Rodgers, 2004). So put forward the research hypothesis;

H1: College students' autonomous motivation has a positive and significant impact on the intention of leisure physical activity.

Norman & Conner(2005,2010) investigated the

predictive power of attitude, subjective norm and perceived behavioral control on intention through two studies, and found that attitude and subjective norm could highly predict physical exercise intention. Intention is influenced by people's general emotional and cognitive orientation toward behavior, perceived pressure from others or society to participate in the target behavior, and self-evaluation of behavioral ability (Karageorghis, 2002). Previous studies related to physical exercise or participation in sports have shown that (Martin, 2012; Caughtry, 2014; Cothran, 2016; Dake & Fahome, 2017) students with a good attitude toward physical activity, students with strong awareness of subjective norms, or students who express strong perceived behavioral control over the activities they participate in are more likely to show a strong intention to participate in physical activity. So put forward the research hypothesis; H2. College students' attitude has a positive and significant impact on their intention to engage in leisure physical activities.

H3. College students' subjective norms have a positive and significant impact on the intention of leisure physical activity.

H4. College students' perceived behavioral control has a positive and significant impact on leisure physical activity intention.

Hagger (2015) using autonomous motivation to test path analysis model, to predict planned behavior theory in health or intention of factors relevant to the movement, namely, attitude, subjective norm and perceived behavioral control, the research results show that if the individuals with independent motive, so, their attitude towards the behavior of the future, subjective norm and perceived behavioral control will be higher. Previous studies also showed that

autonomous motivation, attitude, subjective norms and perceived behavioral control were strongly correlated (Chatzisarantis, Hagger, 2012; Biddle & Karageorghis, 2014). Therefore, this study puts forward the hypothesis;

H5. College students' autonomous motivation has a positive and significant impact on their attitude.

H6. College students' autonomous motivation has a positive and significant impact on subjective norms.

H7. College students' autonomous motivation has a positive and significant impact on perceived behavioral control.

Researchers will be consolidated autonomous motivation and planned behavior theory, found autonomous motivation through the theory of planned behavior attitude, subjective norm and perceived behavior control indirectly predict behavior intentions, which are attitude, subjective norm and perceived behavior control is the intermediary variable between autonomous motivation and behavior intention (Hagger, 2009, 2016). Attitude, subjective norm and perceived

behavioral control can serve as mediators between autonomous motivation and intention. (Hagger, Chatzisarantis, Culver & Biddle, 2003). According to the research sequence of the theory of planned behavior, Hagger (2015) proved the influence process of autonomous motivation on the intention to participate in sports activities. Therefore, attitude, subjective norm and perceived behavioral control have mediating effects between autonomous motivation and intention.

Therefore, this study puts forward the hypothesis; H8. College students' attitude plays a mediating role between autonomous motivation and sports intention in leisure time.

H9. College students' subjective norms play a mediating role between autonomous motivation and sports intention in leisure time.

H10. College students' perceived behavioral control plays a mediating role between autonomous motivation and leisure sports intention.

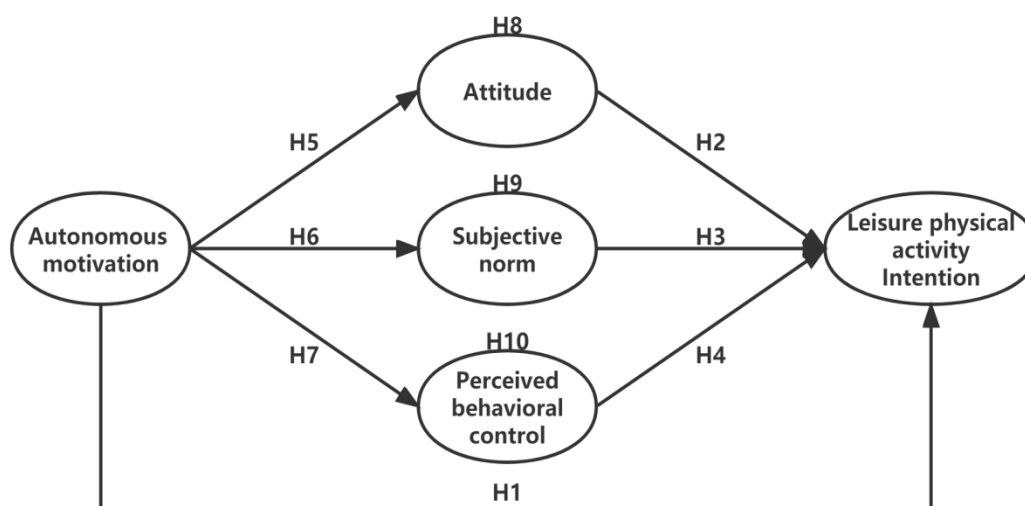


Fig 1. Hypothetical model.

Methodology

Participants and sampling design

In this study, 600 college students from Kunming and Yuxi of Yunnan Province were selected as formal samples by convenient sampling. Invalid questionnaires were eliminated and 567 valid questionnaires were recovered, with an effective rate of 94.3%. The background variables were gender, grade, and school type. The results showed that in terms of gender, there were 243 male students, accounting for 42.4%, and 324 female students, accounting for 57.5%. In terms of grades, 157 freshmen, accounting for 27.9% of the sample, 155 sophomores, accounting for 27.2%, 103 juniors, accounting for 18.1%, 152 seniors, accounting for 27.3% of the sample; In terms of school category, there were 145 national comprehensive universities (25.4), 162 provincial comprehensive universities (28.6%), 128 provincial research universities (22.6%), and 132 municipal comprehensive universities (23.2%).

Measures

In this study, Nikos (2016) was used to compile the exercise Intention Scale for high school students participating in leisure time. On this basis, the research object and related problems are modified. In the scale, attitude included 14 items from two dimensions of affective belief and instrumental belief, subjective norm included 12

items from two dimensions of normative belief and compliance motivation, and perceived behavioral control included 11 items from two dimensions of control belief and convenience perception. The intention was to adopt a latitude of 3 projects. A five-point Likert scale was used. A score of 1 means "strongly disagree" and a score of 5 means "strongly agree". The higher the score, the higher the attitude, subjective norms, perceived behavioral control and intention to participate in leisure physical activities.

In this study, the motor situational Autonomous motivation scale prepared by Lin (2017) was used. The scale included intrinsic motivation, external regulation and non-motivation, with a total of 16 items in 3 dimensions and a five-point Likert scale. A score of 1 means "strongly disagree" and a score of 5 means "strongly agree". The higher the score, the higher the autonomous motivation.

Testing of the measurement model

Table 1 shows the descriptive statistics and correlation coefficient matrix of the hypothesized structure of this study. CFA analysis was performed on the coded data to ensure the reliability and validity of the measurement model before testing the causality between the constructs in the framework.

Table 1 Descriptive statistics and the correlation coefficients matrix.

	M	SD	AM	AT	SN	PBC	IT
AM	3.439	0.588	0.565				
AT	3.855	0.774	0.639***	0.826			
SN	3.727	0.813	0.599***	0.686***	0.679		
PBC	3.534	0.753	0.510***	0.535***	0.637***	0.689	
IT	3.865	0.804	0.463***	0.719***	0.551***	0.536***	0.846

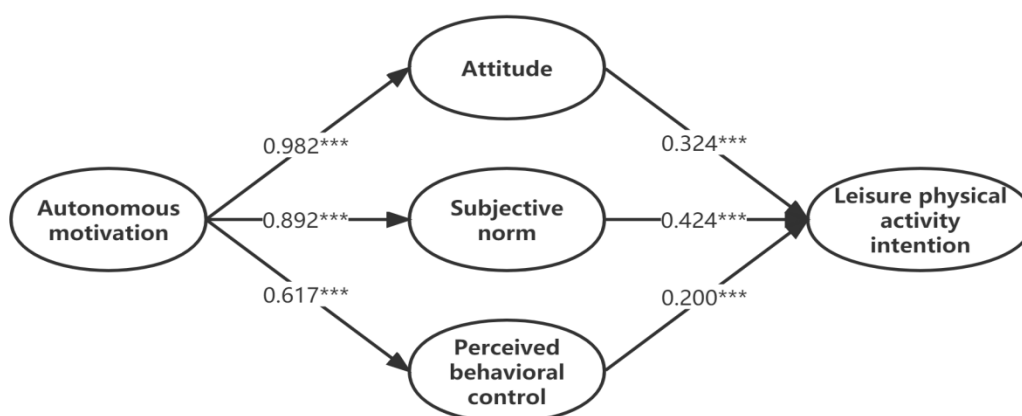
Note: The bold and italic values in the table are the square root of AVE *** $p < 0.001$

AM=Autonomous motivation; IT=intention;
AT=attitude ; SN=subjective norm ;
PBC=perceived behavioral control

CFA test results showed that the goodness-of-fit index of the measurement model was as follows : $\chi^2=598.426$, $DF = 47$, $\chi^2/DF = 12.566$, $GFI=0.868$, $CFI=1.209$, $NFI=1.065$, $RMSEA=0.075$. All the above indicators meet the standard of model fitting data (McDonald & Ho, 2002). The extracted values of construct reliability and mean variance are as follows: The CR of autonomous motivation =0.881, attitude

=0.896, subjective norm =0.906, perceived behavioral control =0.911, and participation intention =0.833, which are higher than the reference value 0.6 and meet the standard (Anderson & Gerbing, 1988). The AVE of autonomous motivation =0.565, the AVE of attitude =0.826, the AVE of subjective norm =0.679, the AVE of perceived behavioral control =0.689, and the AVE of participation intention =0.846, which are higher than the reference value of 0.5 (Anderson & Gerbing, 1988). It can be seen that the convergent validity is good.

Testing of the structural model



Structural equation modeling (SEM) was used to estimate causal relationships among latent variables (Joreskog and Sorbom, 1998). This study followed the SEM data analysis conducted by Anderson and Gerbing(1988) using AMOS 21.0 software package to test whether the collected data were in good agreement with the proposed theoretical model and verify the hypotheses proposed in this study. The results of this study showed that the overall goodness-of-fit index of the structural model was $\chi^2=565.906$, $DF = 47$, $\chi^2/df=12.041$, $GFI=0.848$, $CFI=0.896$,

$NFI=0.888$, $RMSEA=0.139$. This data is in good agreement with the hypothesized structural model (McDonald & Ho, 2002). Secondly, the results of structural equation model showed that attitude ($\beta= 0.324$, $P < 0.001$), subjective norm ($\beta= 0.424$, $P < 0.001$) and perceived behavioral control ($\beta= 0.200$, $P < 0.001$) had statistically significant effects on the intention to participate in leisure physical activities. In other words, the intention of college students to participate in leisure time sports activities depends on their attitude to leisure time sports activities,

subjective norms, perceived behavioral control and autonomous motivation. Moreover, the attitude ($\beta = 0.982$, $P < 0.001$), subjective norm ($\beta = 0.892$, $P < 0.001$), and perceived behavioral control ($\beta = 0.982$, $P < 0.001$) of college students' autonomous motivation were all significant, showing the expected direction. In other words, college students' attitudes, subjective norms and perceived behavioral control of leisure sports activities will be affected by their autonomous motivation.

Mediating effect

In order to test the significance of the mediating effect, the Z-test of Sobel(1982) is one of the most famous methods. Z-test results showed that attitude had a significant mediating effect between autonomous motivation and leisure physical activity intention ($Z = 3.794$, $P < 0.01$). Subjective norms had a significant mediating effect between autonomous motivation and leisure physical activity intention ($Z = 5.828$, $P < 0.01$). The mediating effect of perceived behavioral control between autonomic motivation and leisure physical activity intention was significant ($Z = 2.414$, $P < 0.01$). In other words, attitude, subjective norm and perceived behavioral control play a mediating role between college students' autonomous motivation and their intention to participate in sports activities during leisure time.

Conclusions

Based on the theoretical model of planned behavior proposed by Ajzen(1991), this study explores the intention of Chinese college students to participate in leisure sports activities. The empirical results show that college students' autonomous motivation has a direct effect on

their participation intention in leisure sports activities. The results are similar to previous research results. Rodegers (2014) found in his research on students' non-native language learning based on autonomous motivation that autonomous motivation can directly predict students' intention to participate in courses. A study on students' intention to participate based on autonomous motivation also found that autonomous motivation can directly predict people's intention of physical activity behavior (Ryan, 2016). At the same time, attitude, subjective norm and perceived behavior control have direct effects on college students' participation intention in leisure sports activities. The research results are consistent with previous research results. Norman & Conner(2005) found that attitude, subjective norm and perceived behavioral control can highly predict physical exercise intention by examining the predictive power of attitude, subjective norm and perceived behavioral control on intention. In addition, the results of this study show that the self-initiative opportunities of college students have a direct impact on their attitudes, subjective norms and perceived behavioral control. This result is consistent with previous research results. Hagger (2017) used autonomic motivation to predict the three factors in the theory of planned behavior, which believed that autonomic motivation could effectively affect participants' attitudes, subjective norms and perceived behavioral control. Meanwhile, previous studies have also proved that autonomous motivation has a direct impact on attitudes, subjective norms and perceived behavioral control (Chatzisarantis, Hagger, 2012; Biddle & Karageorghis, 2014). Finally, this study also found that the autonomous motivation of college students can influence their

intention to participate in leisure sports activities through the mediations of attitude, subjective norm and perceived behavioral control. This is similar to the research results of Hagger (2015) on sports participation in leisure time of high school students with different nationalities and backgrounds. This research used the theory of planned behavior to prove the mediating effect of attitude, subjective norm and perceived behavioral control between autonomous motivation and participation intention of sports activities. Chatzisaranyis (2019) also showed that attitude, subjective norm and perceived behavioral control played a mediating effect between autonomous motivation and middle school students' learning behavioral intention.

The results of this study have a certain theoretical contribution to the literature. The results of this study confirm that when college students have a higher level of autonomous motivation, their intention to participate in leisure sports activities will be stronger. At the same time, if the attitude, subjective norm and perceived behavioral control of college students are positive, they will have more intention to participate in leisure sports activities. In addition, this study also confirmed that the attitude, subjective norm and perceived behavioral control of college students participating in leisure sports activities are determined by their degree of autonomous motivation. Finally, this study further confirmed that attitude, subjective norms and perceived behavioral control played a mediating role between college students' autonomous motivation and their intention to participate in leisure sports activities. In other words, when college students have a higher level of autonomous motivation, their attitude towards leisure sports activities, subjective norms and

perceived degree of behavioral control will increase, so that their intention to participate in leisure sports activities will become more positive.

In addition, the results of this study have some implications for the development and implementation of sports activities in college leisure time. When college students have sufficient autonomous motivation, they will have more positive attitudes, subjective norms and perceived behavioral control to participate in leisure sports activities. Therefore, the leaders of colleges and universities should enhance the autonomous motivation of college students for leisure sports activities. In addition, the specific implementation and development of relevant activities will be organized through public physical education departments at the teaching level and relevant associations at the student level, and some relevant policy support will be provided, as well as professional suggestions and guidance. As long as the autonomous motivation of college students to participate in leisure sports activities is improved, they will adopt a more positive attitude, subjective norms and perceived behavioral control to enhance the intention of leisure sports activities.

It is worth noting that this study finds that college students' subjective norms are the most indispensable influencing factor among the three factors of the theoretical model of planned behavior. This means that college students' perceived support from significant others for the process of participating in leisure time physical activities is one of the important determinants of their participation in leisure time physical activities. If college students feel the support and approval from teachers, classmates or public opinion before or during participating in leisure

time sports activities, they will have a stronger intention to participate in leisure time sports activities. Therefore, it has become an important issue to establish a more positive campus opinion or a healthy movement atmosphere for college students. However, so far, most of China's colleges and universities in the sports atmosphere is still insufficient, in addition to the normal physical education course teaching, in the spare time there are few leisure time students sports activities. Therefore, as the leaders of colleges and universities should pay more attention to the construction of campus sports culture and promote the construction of campus sports atmosphere.

The main limitation of this study is to investigate the intention of college students to participate in sports activities in leisure time based on the theory of planned behavior, rather than the actual participation behaviors of college students. Previous studies have shown that theoretical models of planned behavior are robust in many behavioral domains (Ajzen, 2001; Eagly and Chaiken, 1993), but the intentions people have are not always equivalent to their actual actions (Belk, 1985). This study puts forward several prospects for future research. Future research could further investigate the actual behavior of college students participating in leisure sports activities through observation or interviews. In addition, more environmental or situational factors that influence college students' intention to engage in leisure time physical activity can be considered, such as; The hardware facilities and supporting conditions of college students participating in leisure sports activities and the current sports trend and so on.

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