How Does the Culture of Sports Circle Affect the Willingness to Continue Sports: Intention to Use Smart Bracelets Based on Social Platforms

Manjiang Xing[1,*], Chi Gong[1,*], Ziyang Liu[1], Dae-won Oh[2], Shuai Jiang[1], Xiaohong Ge[3,*]

[1]Graduate School of Global Business, Kyonggi University, Suwon 16227, South Korea
[2]Graduate School of Sogang University, Sogang University, Seoul 04107, South Korea
[3]Sinosteel Xingtai Machinery and Mill Roll Co., Ltd., Xingtai 054000, China

Abstract: Purpose: This paper mainly discusses the influencing factors of smart bracelet exercise use intention based on social platform. Methods & Results: This paper introduces the definition of sports circle culture and uses it as the moderator variable of TAM model. This model combines the technical elements, takes the influence factors of the cultural elements of the sports circle on the model path as the breakthrough point of the problem, and constructs the multi-factor model of the influence path of the technical elements on the perceived usefulness and perceived ease of use, as well as the influence intention of the sports continuity. A total of 390 valid samples were obtained through questionnaires, and SPSS and MPlus were used to analyze and determine the sample data. Conclusion: The results show that personalization and recommendation are positively related to perceived usefulness and perceived ease of use. Sociability was negatively correlated with perceived usefulness, but had no significant correlation with perceived ease of use. The cultural elements of the sports circle and perceived usefulness are negatively correlated with the willingness to continue sports, and the rest of the hypotheses are verified. Through the analysis of the above conclusions, it is concluded that the cultural characteristics of the circle with the movement of scientific and technological civilization are more inclined to the personalized and recommended elements of perceived ease of use. Therefore, the future product design and development or supply direction of the corresponding product or service provider is proposed.

Keywords: Sports Circle Culture; Smart Bracelet; Sports Social Platform; Motion Persistence Intention

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1 Introduction

With the development of China's economy, the public's willingness to exercise health has been further enhanced. Affected by the widespread epidemic, outdoor sports and high-end private training exercise modes have become popular, and the subsequent forms of sport-related consumption have also shown diversified development, and the influence of the circle between sports groups has gradually increased. Deep users in vertical fields are more willing to express themselves and share diversified sports consumption experience in circles with the same sports interest. The sports circle culture presents a diversified development trend of individuation, refinement and quality.

Under this trend, it is bound to create a new consumption mode of sports circle, and the brand, personalization, refinement and quality are bound to carry out corresponding positioning and matching with the corresponding circle culture. In addition, sports circle culture will be affected by relevant social environment and regional geographical

*Corresponding author: Manjiang Xing, 15271365@qq.com; Chi Gong, gongchi81@qq.com; Xiaohong Ge, 64086286@qq.com

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environment and other factors. For example, the successful holding of the 2022 Beijing Winter Olympics and the influence of corresponding policy environment, ice and snow themed outdoor sports are more popular than other sports circle culture. Summer water sports, diving, mountain climbing, cycling, holiday camping and so on will also be popular. Sports circle culture will also be affected by the level of public economic consumption, health awareness and other aspects. For example, some social elites will pay more attention to the quality and personalization of sports to highlight their unique personalized needs. People with strong health awareness tend to pursue the physical and mental feelings brought by the refinement and quality of sports. At present, relevant research on the constructs such as "circle" and "circle" in the circle culture has shown the importance of circle. Yan Chaofei (2022) [1] took college students as the research object to discuss and study the "circle" communication pattern in which the circle communication of college sports culture gradually converges with many subcultures. Du Xin (2022) [2] introduced the concept of circle culture into the blind box industry of tide play to form the characteristic cultural circle of interest, community and chain community. Liu Yichuan (2021) [3] studied the characteristics and fields of cultural identity communication in circle communication. Zhao Peiyan (2022) [4] took social media as the background to explore the influencing factors and mechanism of the "circle" communication of cyberpunk culture and explain the development of "circle culture." However, the quantity and quality of research literature on the influence of sports circle culture on the continuous intention of sports are relatively thin, and the research on the influence degree of sports circle culture on the consumption level effect of corresponding brand products and services is still at the stage of proposing and hypothesis of the concept of circle, and has not fundamentally solved the explanation of the influence mechanism of circle culture. Therefore, this paper attempts to analyze the influence mechanism of sports circle culture on the continuous willingness to exercise based on the survey report on the use intention of smart bracelet based on the background of social platform, and tries to find the overlapping influence area of human emotional development trajectory and technological product progress.

To sum up, different sports qualities, personality differences and different levels of refinement of sports forms indirectly create different sports circle culture, and different circle culture will also stimulate the corresponding sports consumer groups to form different sports circle. How do personalization and sharing and recommendation behaviors among members of circle cultural groups affect the degree of exercise persistence willingness? What is the magnitude and direction of its influence? With respect to the above issues, this paper will attempt to explain this here.

2 Theoretical Approach Assumes

The process of sports socialization involves utilizing sports behavior as a means of communication and sharing, thereby fostering social connections. Sports-oriented social platforms serve as mediums for engaging in sports-related behaviors. As the main carrier and media of sports circle culture, sports social platform plays a role in promoting and promoting the communication among sports circle groups. Sports circle groups can share and obtain relevant sports experience, track, data and sports experience on social platforms, and experience fresh experiences brought by different cultures and sports methods, so as to meet the personalized exploration and discovery desires of the circle groups. This paper holds that based on different sports social multimedia platforms, social apps and corresponding supporting intelligent wearable equipment, such as the realization of group interaction function, cultural communication ability, group concept integration and sharing, and then form a new circle ecological service system or product service field, and can develop and expand through continuous integration. Finally, it becomes a brand new cultural ecological service system of sports circle with sports social media, and this brand new cultural ecological service system of sports circle is referred to as sports circle culture. The circle culture of the movement is born and developed with the rapid development of the Internet era. In addition, the wide application of artificial intelligence, 6G and big data interaction technology has become the main technical driving force of the circle culture.

In this paper, the culture of sports circle is defined, and then different connotations of sports circle are used to define the individuation, sociability and recommendation needs of sports circle groups. The specific concepts of circle culture are embodied by analyzing the preference of circle group sports consumption products, the number of group members, and the quality of shared experience among group members, so as to judge the quality, level and urgency of product and service demand generated by different movement circle groups, so as to match corresponding ecological products and services for different circle cultures. At present, according to different

sports forms and exercise intentions, this paper is divided into running, fitness, hiking, ball games, mountaineering, cycling, swimming, extreme sports and other types of circle ecosystems. Ball games include different kinds of known ball games, such as football, basketball, table tennis, baseball, football, golf, etc., which are not subdivided here. However, because it includes the influence of factors such as the difference in consumption level of different types and the number of group members, each category of ball games can be summarized as a subdivided sports circle culture, and this paper will not carry out segmentation discriminant analysis here. Naturally, extreme sports also include different kinds of extreme sports, such as diving, rock climbing and so on. Each of these extreme sports can be classified into a specific type of sports circle cultural connotation. This paper also does not make a subdivision of positioning here. For the above mentioned sports culture, this paper only extracts the public factors with high attention for investigation and evidence collection analysis. In view of the lack of space and professional knowledge preparation, this paper does not further subdivide and position the corresponding sports culture. At the same time, because different sports circle culture will cover different age levels, different educational backgrounds, different income levels and different family backgrounds and other elements. Therefore, this paper will make a questionnaire and analyze and demonstrate the corresponding survey report on the basis of such factors. Figure 1 shows the legend explanation of cultural concepts in the movement circle.

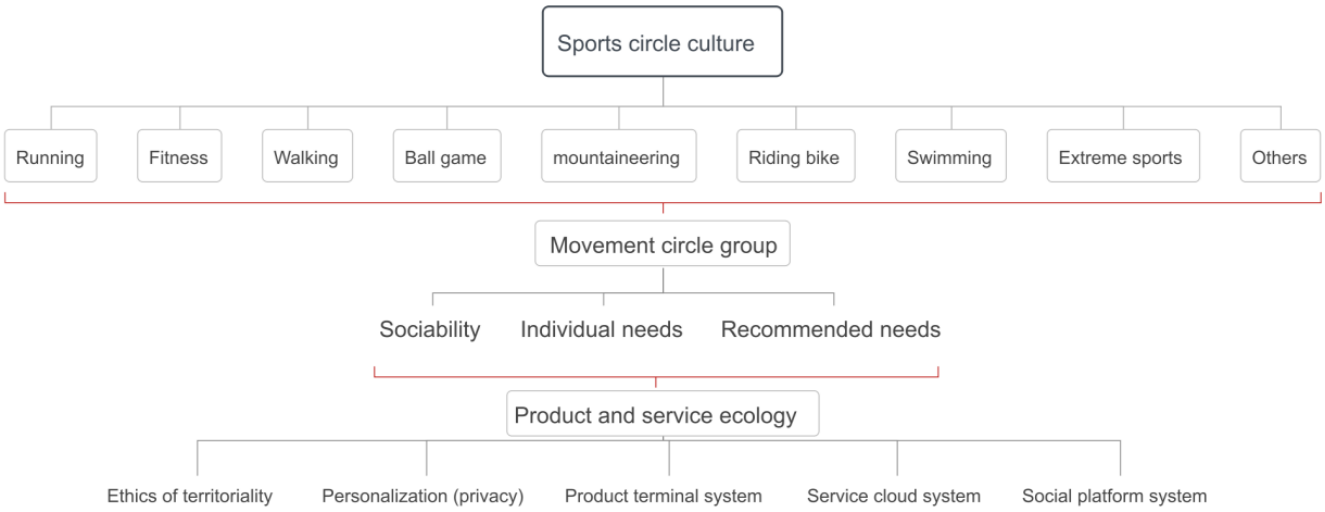

Figure 1 Sports circle culture

The above explained the research connotation of this paper by defining and analyzing the relevant elements of sports circle culture. In addition, this paper also notes that sports circle culture is applied to the personalized fields of different sports circle cultures through embodied product and service demand, and the elements of sports circle culture demand are mainly reflected in the ecosystem of providing specific products and services. For example, smart wearable products, social platforms, etc., these products and services reflect the concerns of circle culture ethics, personalization and privacy.

According to TMALL and KEARNEY's survey and research report, the gender ratio of males and females is 50% in different sports circles. In terms of age description, under 35 years old is the main force of outdoor sports consumption, accounting for about 55% of the total consumption. Among them, 25-34 years old sports consumption group accounted for 36% of the total outdoor sports group, but its sports consumption contribution value reached 44%. In addition, the number and amount of middle-aged and elderly sports consumer groups are increasing year by year, which is related to the age proportion of the Chinese social population, and is also the result of the expansion of the proportion of the Chinese middle class. According to the current number of outdoor sports consumer groups and the regional distribution of consumption amount in China, it can be seen that 34% of the consumer groups in first-tier and second-tier cities contribute 41% of the consumption value, while the number of consumer groups in third-tier and fourth-tier cities account for 59% and 52% of the consumption value, and there is a trend of gradual expansion.

This paper notes that at the current level of scientific and technological development, smart wearable devices are no

longer characterized as health monitoring hardware devices, but also form an intelligent terminal that can communicate through interactive software support, data interconnection, cloud interaction and relying on powerful computing power centers. Compared with the previous interactive forms, the new interactive experience form promotes the interconnection of everything and data sharing, providing a new situational mode for the personalized pursuit of different groups. Therefore, the integration of technology and group needs has become the key to open a new era of the Internet of Things. From the various types of smart wearable devices and the proportion of consumer expenditure, it can be found that the smart wearable device market is mainly dominated by TWS headphones, smart watches and VR/AR devices. Smart watch, namely smart sports bracelet (referred to as bracelet), is a collection of recording, data analysis, health management, watch, telephone, navigation and positioning as one of the smart wearing equipment, because it can be matched with the wrist like a watch and has different functions from traditional watches, so it is commonly known as smart bracelet. The core functions of smart bracelets are interaction records, data interaction analysis and health management. Like all smart wearable devices, smart bracelets are wearable, sustainable, interactive, mobile and simple to operate. In addition, the smart bracelet also has beautiful fashion, watch, navigation and positioning, leisure and entertainment and social interaction functions. Finally, with the continuous progress of social science and technology level, intelligent equipment represented by intelligent bracelet will eventually usher in "intelligent carrier +VR/AR+ wide-area social ecosystem +6G+Metaverse=MR (mixed reality) global ecological model". MR Equipment will certainly lead the new trend of scientific and technological mixed reality. At the same time, considering the wide distribution of audience groups such as smart bracelet and high acceptance of audience groups, MR Global ecological model will develop deeply along the realization of smart devices. In view of the rapid development trend of smart wearable devices, as well as the extensive attention of the sports circle to the influence of personalized, recommended and social factors between groups, the consumption of corresponding sports intelligent products and services has soared. For the above reasons, this paper deduces and demonstrates the factors and corresponding factors that affect the use of sports products and equipment and the willingness to continue sports in the sports circle culture, and tries to summarize the corresponding factors as much as possible. At the same time, it is hoped that it can provide some reference for the corresponding product design and development as well as the research on the ethical culture of the corresponding sports circle.

3 Literature Review and Research Hypotheses

3.1 Theory and Literature Review

It can be seen from the above that sports circle culture is defined as a kind of new circle ecological service system or product service field based on the realization of group interaction function, cultural communication ability and group concept integration and sharing based on different sports social multimedia platforms, social APP software and corresponding supporting intelligent wearable equipment, which can develop and grow through continuous integration. Finally, it will become a new cultural ecological service system of sports circle with sports social media. According to the definition and the development trend of modern MR Mixed reality situation, sports circle culture should be able to meet the multiple functional needs of human survival, social interaction and entertainment in the future.

On the concept of "circle" culture, this paper selects some achievements of master's and doctoral papers and journal papers of similar majors in recent years to show. For example, Yan Chaofei (2022) [1] believed that from the perspective of communication path, the hierarchical communication of college students' group sports culture is a new interpersonal communication and group communication based on the background of new media and the hierarchical communication. On this basis, it puts forward the elements of the stratified communication process based on the "5W" path, and concludes that the main motivation of the stratified communication of college students' group sports culture is "the conclusion of interest and relationship", and "social needs" is the direct driving force. Du Xin (2022) [2] studied the cultural characteristics of the circle of the blind box symbol: interest, community and chain community, and tried to find the future long-term development path of the blind box from the three levels of text, symbol and culture. Liu Yichuan (2021) [3] studied the relevant research literature on "circle communication" and "cultural identity," and on

this basis defined that "circle communication" is about the dispersed participants in the network society relying on one or more specific commonalities. It is a communication activity with close connection and clear boundary by using network communication media tools, which has a far-reaching impact on the field of public opinion, social relations, group communication and other aspects. Zhao Peiyan (2022) [4] believed that with the further development of "circle culture," the interest tribe with "circle" as the external structure gradually became stable, and after adapting to the network communication mode, the cultural circle with "circle" as the main structure was formed. Su Jiaying (2021) [5] studied the new consumption trends presented in the "national trend" clothing consumption market, and took the "national trend" clothing consumption ecological circle formed under the influence of hip-hop culture as the research core, and proposed the "national trend" clothing design thinking model based on the integrated thinking of local culture into the trend consumption demand.

It can be believed that the development of "circle culture" cannot be separated from the complementary effect of various social platforms, which can promote the development and expansion of circles among groups with similar interests, hobbies, professional expertise and similar fields. In addition, the progress of smart wearable products and services provides another supporting tool for interactive effects between groups in a wider range and field. For example, smart wear that monitors health data can provide a connection between members with different personal backgrounds who have similar needs. Providers of the same products and services can better organize the experience exchange and interaction between product or service users, thus gradually expanding and forming a new circle of groups. The sharing experience behavior of user group members of intelligent equipment helps to improve users' perception of use, thus indirectly or actively guiding the growth of users' continuous use intention, and providing preconditions and motivation for the final continuous movement intention. Mo Qingming and Yang Ting (2022) [6] studied the relevant factors affecting users' willingness to continue using smart wristbands based on UTAUT. Zhang Yong, Wang Xu, and Li Zhangyu (2021) [7] constructed a chain mediation model of the influence of quantified self on the continuous use intention of wearable devices, and the research results showed that quantified self had a positive impact on the continuous use intention of wearable devices. Perceived ease of use has a partial mediating effect between quantified self and continuous use intention of wearable devices; Perceived usefulness has a partial mediating effect between quantified self and continuous use intention of wearable devices; Perceived ease of use and perceived usefulness have a partial chain mediating effect between quantified self and intention to continue using wearable devices. ZHANG Bin, CUI Hai-lan, SHAN Si-yuan, WANG Wen-ya (2023) [8] studied the influencing factors model of users' continuous use intention of health short video platform based on TAM model and technical factor analysis. In particular, we need to explain and thank the authors of this paper, whose research results provide an inspiring reference path for the relevance study of this paper.

It is found that most studies adopt or based on TAM, ECM, UTAUT and other models to construct a research framework between perceived usefulness, perceived ease of use and users' intention to continue using. Among the classical adoption theories, Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB) are the two most important frameworks for studying Internet adoption. In addition, the theoretical model of Expectation Confirmation was first proposed by Oliver in the basic framework of Expectation Confirmation Theory (ECT) in 1980, which has been widely used in the field of consumer behavior research. Research is conducted on consumers' expectations before purchase, satisfaction after purchase and behavior after purchase [9].

Bhattacherjee (2001a) [10] proved that the main factors affecting the intention to continue using were perceived usefulness and satisfaction and constructed an ECM-IT model. Hsu, Chiu and Ju (2004) [11], Bhattacherjee, Perols and Sanford (2008) [12], and Lee (2010) [13] used the TAM-ECM model to study the ECM-IT model. Results It was found that satisfaction, expectation confirmation, self-efficacy, perceived entertainment and other factors affected users' continuous use intention. Hong (2005) [14] constructed the EECM-IT model based on the research models of the above scholars, and found that perceived usefulness, perceived ease of use and satisfaction had a direct impact on the intention to continue using. Meng (2018) [15] studied the continuous use behavior of mobile social media users, integrated the ECM model and self-determination theory, and constructed a research model. Yu Yanni (2020) [16] took Keep as an example and relied on the technology acceptance model (TAM) to explore the mediating explanatory mechanism of exercise commitment between social platforms and exercise persistence. Yu Yanni (2020)

[16] believes that exercise performance can predict exercise commitment through self-efficacy, satisfaction and exercise motivation, and exercise commitment can predict exercise persistence of college students. Wang Lin, Hu Mengdi and Zhu Wenjing (2017) [17] explored the impact of users' use behaviors of sports social platforms and smart wristbands on their use and purchase intentions.

Shang Meng, Li Hui et al. (2019) [18] constructed and studied the logical relationship model between the use diffusion and continuous use behavior of South Korean users using Xiaomi sports bracelet based on the diffusion model theory. Wang Pei (2021) [19] conducted a study on users' continuous use intention and related influencing mechanism of sports dance mobile apps based on TAM-ECM model, introducing five variables including perceived entertainment, perceived trust, perceived cost, user habits and subjective norms as influencing factors of users' continuous use intention of sports dance apps. And finally get its influence mechanism. Liu, Wang, and Qian (2015) [20] used questionnaires and mathematical statistics to demonstrate that sports apps have a significant role in promoting people's physical exercise behavior and habit formation.

The biggest advantage of TAM theory lies in its simplicity and ease of use. In view of the above literature review and introduction, the research model of this paper is constructed based on TAM model theory, and the contribution degree of technical factors, perceived usefulness and perceived ease of use to the continuous intention of exercise is studied. The overall model takes the sports circle culture as the mediating moderating effect parameter for empirical analysis. To explore the moderating effect of cultural characteristics of sports circles on perceived usefulness and perceived ease of use relative to the intention to continue sports. This paper takes the continuous willingness to use sports such as smart bracelets based on social platforms as the research object, and tries to explain the degree of bias moderation effect of sports circle culture on relevant factors affecting the continuous willingness to use sports. In addition, this paper provides some reference value for promoting the integration and innovation development of related industries.

3.2 Research Model and Hypothesis

Based on the above discussion, this study will construct a research framework based on the TAM model (as shown in Figure 2). The intention to use smart wristbands based on social platforms was investigated and analyzed. It provides indicators of the strength of the moderating effect of endogenous guidance and exogenous factor bias. The research model mainly reflects two aspects: perceived usefulness and perceived ease of use. By analyzing the degree of biased influence of sports circle culture on the above two factors, this paper provides a reference guide for the design and development direction and service of social platforms and smart wearable products.

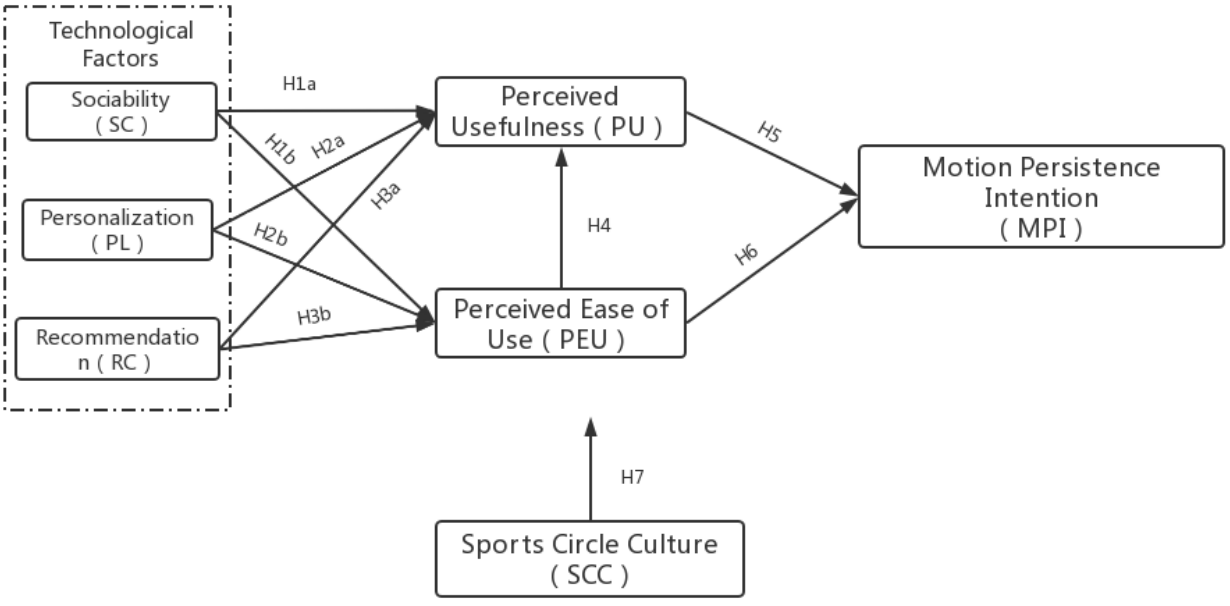

Figure 2 Research model

According to the research model, the previous discussed theories and the degree of integration of research literature review, the main research directions and problems of this paper are summarized and refined, and the following theories and path hypotheses are finally put forward.

Hypothesis:

H1a Product and service sociability positively affects users' perceived usefulness.

H1b The sociability of products and services positively affects users' perceived ease of use.

H2a Product and service personalization positively affects users' perceived usefulness.

H2b Product and service personalization positively affects users' perceived ease of use.

H3a Product and service recommendation positively affects users' perceived usefulness.

H3b Product and service recommendation positively affects users' perceived ease of use.

H4 Users' perceived ease of use positively affects users' perceived usefulness.

H5 Users' perceived usefulness positively affects users' intention to continue exercise.

H6 Users' perceived ease of use positively affects users' Motion Persistence Intention.

H7 movement circle culture has a moderating effect on the whole path.

4 Empirical Research

4.1 Questionnaire Design and Investigation

In this study, users of domestic and foreign mainstream social platforms and smart bracelet brands are used as data collection samples, and data are collected through questionnaire survey. The questionnaire contains seven latent variables and 23 observed variables. This scale adopts the Likert classic 5-level scale to construct the semantic environment. Among them, the scale semantic environment ranges from "completely disagree" to "completely agree." The specific expressions were completely disagree, disagree, neutral, agree, and completely agree, which were assigned 1, 2, 3, 4, and 5 points respectively. In order to ensure that the reliability and validity of the scale meet the requirements, this study draws on the measurement items of some existing research results, and improves them by combining the corresponding situations of social platforms and sports items, so as to obtain the measurement items of this study (see Table 1).

Table 1 Measurement scale

Variables	Item	Measurement Index	Document Source
Sociability	SC	A social platform is a communication channel that keeps users in close touch.	Karahanna [21]
		Social platforms increase my chances of meeting people who share my interests.	
		Through social platforms, I can share sports experience with my friends and enhance friendship.	
Personalization	PL	Social platforms understand my specific interests.	Zhang [22]
		Social platforms know what I want.	
		Social platforms store my preferences and provide services based on my preferences.	
Recommendation	RC	Social platforms can push me information that meets my requirements at the right time.	Kumar [23]
		The information pushed by social platforms is what I need these days.	
		The information provided by social platforms is in my area of concern.	
Sports Circle Culture	SCC	I am willing to participate in activities related to the sports circle and share my experience with other members.	Chen Xueping et al (2016) [24]
		I will actively seek solutions to problems among sports circles.	
		I believe that the interaction between members of the movement can help improve the perceived usefulness of products and services.	
		In my opinion, the active sharing of sports experience among members of the sports circle helps to improve the perceived ease of use of products and services.	
		In my opinion, the process of sharing sports experience among members of the sports circle helps to prolong the willingness to continue sports.	
Perceived Usefulness	PU	In my opinion, the interaction between the social platform and the smart bracelet can help improve the satisfaction of the smart bracelet.	Davis [25] Dong Xuewang et al (2011) [26]
		I think the process of using smart bracelet can get a sense of sports achievement.	
		I think the smart bracelet interactive application interface friendly can get the satisfaction of use.	

Variables	Item	Measurement Index	Document Source
Perceived Ease of Use	PEU	I think smart bracelet technology innovation can get a better sense of use experience.	Davis [25] Dong Xuewang et al (2011) [26]
		I think smart bracelet products are easy to use and efficient.	
		I think using smart bracelet products can easily get a sense of superiority.	
Motion Persistence Intention	MPI	I will extend the exercise time of the smart bracelet because of the satisfactory interactive experience.	Bhattacherjee [10] Davis (1989) [25]
		I will extend the exercise time of the smart bracelet because of the recognition of the circle culture.	
		I will extend the exercise time of the smart bracelet because of the achievements of the growth experience.	

4.2 Data Collection

This study selected people from different industries, different age levels, different interests and different social groups to carry out research, a total of 400 questionnaires were issued, and 390 effective questionnaires were finally recovered, with an effective rate of 97.5%. The questionnaire recovery and verification cycle lasted for 5 months, repeated several times in the middle, and paid a lot of time and energy to visit and investigate the sampling situation. Finally, the statistical distribution of demographic characteristics of the valid sample data of the questionnaire is shown in Table 2.

Table 2 Statistical characteristics of sample demographic distribution

Variables	Item	Frequency	Percent (%)
GENDER	Male	257	65.9
	Female	133	34.1
AGE	<18	3	0.8
	18-24	11	2.8
	25-34	154	39.5
	35-44	194	49.7
	5	18	4.6
	>55	10	2.6
Education	Junior high school and below	4	1
	high school	8	2.1
	college	8	2.1
	University	67	17.2
	Graduate and above	303	77.7
MARITAL	Married	269	69
	Unmarried	121	31
Children	0	7	1.8
	1	198	50.8
	2	58	14.9
	>2	6	1.5
	-999	121	31
ChildrenGENDER	Male	127	32.6
	Female	75	19.2
	-999	188	48.2
Lover's education level	Junior high school and below	1	0.3
	high school	4	1
	college	5	1.3
	University	154	39.5
	Graduate and above	131	33.6
	-999	95	24.4
BROTHERS	only child	189	48.5
	1	106	27.2
	2	93	23.8
	>2	2	0.5
INCOME	<3000	27	6.9
	3000-5000	20	5.1
	5000-8000	79	20.3
	8000-11000	74	19

Variables	Item	Frequency	Percent (%)
	11000-18000	68	17.4
	>18000	122	31.3
exercise frequency	Exercise occasionally	33	8.5
	once a week	253	64.9
	2-3 times a week	91	23.3
	4 or more times a week	13	3.3
Length of use time	6month	201	51.5
	1year	111	28.5
	2year	39	10
	3year	7	1.8
	>3year	32	8.2
BRAND	HUAWEI	157	40.3
	Xiaomi	52	13.3
	Apple	123	31.5
	OPPO	19	4.9
	Samsung	39	10
Social media platforms	WeChat	175	44.9
	Tik Tok	55	14.1
	QQ	9	2.3
	MicroBlog	15	3.8
	quick worker	16	4.1
	bilibili	41	10.5
	Red book	49	12.6
	Zhihu	6	1.5
	Kakao Talk	9	2.3
	Facebook	4	1
	Twitter	3	0.8
	Google	8	2.1
Time of exercise	1H	228	58.5
	2H	108	27.7
	3H	48	12.3
	4H	2	0.5
	>4H	4	1
Partner in sports	alone	229	58.7
	1person	51	13.1
	2person	71	18.2
	3person	3	0.8
	>3person	36	9.2
Form of motion	Running	148	37.9
	Ball sports	26	6.7
	Comperitive extreme sports	18	4.6
	mountaineering	71	18.2
	Swimming	38	9.7
	Walking	89	22.8

The basic statistical data of the sample in this study showed gender, age, education level, marital status, status of core family members, income level, frequency and duration of exercise, length of use of corresponding products or services, brand preference of products and services, number of members of the sports circle and choice of sports forms. This information can help researchers better understand the participants themselves and the surrounding social environment. It is helpful to match and develop the semantic environment of the research, so that the researchers can summarize the semantic environment of the sports circle culture more closely, and provide reference for the subsequent research.

4.3 Data Analysis

In this study, SPSS26.0 and Mplus were used for scale data and model analysis. The reliability and validity test of the sample data of the scale is mainly realized through the data statistical analysis software SPSS26.0. Among them, the reliability and validity analysis of the scale is shown in Table 3. It can be seen from Table 3 that the

Cronbach'a value of each dimension component is higher than the standard value 0.7. Among them, Z>1.96, CR>0.7, AVE>0.5, std.>0.7, P<0,05. In addition, it can be found that the value of the AVE square root of each variable is greater than the value of the relationship between this variable and other variables. Table 4 shows the test results of differential validity of scale data. As can be seen from Table 4, there are obvious differences among the component factors: sociology, individuation, recommendation, moderating variable sports circle culture, perceived usefulness and perceived ease of use, and willingness to continue sports. Mean (min. PL=4.338, Max. MPI=4.675) and SD (min. MPI=0.453, Max. PL=0.711) meet the requirements. Table 5 shows the accuracy and internal consistency among factors of the scale. KMO value of Bartley spherical test is 0.889, greater than 0.8, indicating that the questionnaire is suitable for factor analysis and meets the needs of this study. Based on the above analysis results, it can be shown that the questionnaire scale has statistical analysis characteristics and meets the requirements of this study.

Table 3 Reliability and validity test of the scale

Dimention	Item	Unstd.	S.E.	Z	P-Value	Std.	Cronbach'a	CR	AVE
SC	SC1	1.000				0.889	0.900	0.901	0.752
	SC2	0.883	0.042	20.779	0.000	0.823			
	SC3	0.982	0.042	23.298	0.000	0.888			
PL	PL1	1.000				0.958	0.963	0.964	0.900
	PL2	1.015	0.023	44.359	0.000	0.960			
	PL3	0.861	0.023	37.827	0.000	0.928			
RC	RC1	1.000				0.991	0.987	0.987	0.961
	RC2	0.991	0.007	137.819	0.000	0.999			
	RC3	0.910	0.016	55.721	0.000	0.950			
SCC	SCC1	1.000				0.938	0.971	0.972	0.875
	SCC2	0.875	0.025	35.183	0.000	0.929			
	SCC3	0.990	0.026	38.201	0.000	0.942			
	SCC4	0.951	0.024	40.296	0.000	0.957			
	SCC5	0.846	0.026	32.433	0.000	0.910			
PU	PU1	1.000				0.934	0.972	0.973	0.924
	PU2	1.079	0.026	41.291	0.000	0.965			
	PU3	1.071	0.024	45.072	0.000	0.984			
PEU	PEU1	1.000				0.924	0.961	0.964	0.899
	PEU2	0.988	0.024	40.723	0.000	0.984			
	PEU3	0.919	0.027	34.428	0.000	0.935			
MPI	MPI1	1.000				0.938	0.907	0.923	0.800
	MPI2	0.978	0.030	32.226	0.000	0.944			
	MPI3	1.072	0.049	21.738	0.000	0.793			

Table 4 Discriminant validity test of latent variables of the scale

Latent variable	Mean	SD	SC	PL	RC	SCC	PU	PEU	MPI
Sociability	4.490	0.639	0.867						
Personalization	4.338	0.711	-0.002	0.949					
Recommendation	4.442	0.620	0.441	0.286	0.980				
Sports Circle Culture	4.498	0.585	0.296	0.497	0.586	0.935			
Perceived Usefulness	4.631	0.507	0.202	0.375	0.385	0.601	0.961		
Perceived Ease of Use	4.507	0.553	0.499	0.388	0.594	0.824	0.506	0.948	
Motion Persistence Intention	4.675	0.453	0.341	0.295	0.391	0.392	0.436	0.353	0.894

Table 5 KMO and Bartlett test results

KMO sample appropriateness measure		0.889
Bartlett sphericity test	Approximate chi-square	13451.279
	Degree of freedom	253
	significance	0.000

5 Model Analysis

5.1 Confirmatory Factor Analysis

In this study, structural equation analysis software Mplus8.3 was used to test the relevant parameters of the model, and confirmatory factor analysis was used to test the differential validity of the variables, and comparison was made among the factor models (see Table 6). The results showed the fitting indexes of the seven-factor model ($\chi2$=1285.771, df=209, $\chi2$/df=6.152, RMSEA=0.115, SRMR=0.054, TLI=0.904, CFI=0.920). Although $\chi2$/df>3, RMSEA>0.08, but SRMR<0.08, TLI>0.9, CFI>0.9, that all conditions are satisfied. And the above numerical performance of the seven-factor model (P values are both <0.05) is significantly better than other factor models. The above verification results prove that the current seven-factor model has good discriminative validity and convergent validity, and the internal index quality of the scale is good. In addition, considering the removal of the mediating factor, sports circle culture, the remaining six factors were compared between the six-factor benchmark model and the single model. The results showed that $\chi2$/df>3, RMSEA>0.08, SRMR<0.08, TLI<0.9, CFI<0.9 P<0.05. The verification results of the removal of mediators showed that although there were still significant differences in the comparison models, the effect of the relevant fitting indexes was not obvious. Therefore, it is indirectly proved that there is a mediating regulator, that is, the benchmark seven-factor model containing sports circle culture can better express the research results and significance, and this mediating regulator plays a significant role in the research model in this paper.

Table 6 Results of confirmatory factor analysis

Fitting Index	χ^2	**df**	χ^2/**df**	**RMSEA**	**SRMR**	**CFI**	**TLI**	**Comparison of models**			
								Model Comparison	**Dc2**	**Ddf**	**P**
1. Baseline Model (seven factors)	1285.771	209	6.152	0.115	0.054	0.920	0.904				
2. Six-factor model 1	1950.670	215	9.073	0.144	0.090	0.872	0.849	2 vs. 1	664.899	6	0.000
3. Six-factor model 2	2636.078	215	12.261	0.170	0.106	0.821	0.789	3 vs. 1	1350.307	6	0.000
4. Six-factor model 3	3408.129	215	15.852	0.195	0.084	0.764	0.722	4 vs. 1	2122.358	6	0.000
5. Six-factor model 4	2136.314	215	9.936	0.151	0.068	0.858	0.833	5 vs. 1	850.543	6	0.000
6. Six-factor model 5	2540.716	215	11.817	0.167	0.094	0.828	0.798	6 vs. 1	1254.945	6	0.000
7. Six-factor model 6	2208.040	215	10.270	0.154	0.098	0.853	0.827	7 vs. 1	922.269	6	0.000
8. Five-factor model 1	3285.698	220	14.935	0.189	0.125	0.773	0.740	8 vs. 1	1999.927	11	0.000
9. Five-factor model 2	4051.150	220	18.414	0.211	0.108	0.717	0.674	9 vs. 1	2765.379	11	0.000
10. Five-factor model 3	2802.276	220	12.738	0.173	0.100	0.809	0.781	10 vs. 1	1516.505	11	0.000
11. Five-factor model 4	3208.425	220	14.584	0.187	0.119	0.779	0.746	11 vs. 1	1922.654	11	0.000
12. Five-factor model 5	2835.925	220	12.891	0.175	0.119	0.807	0.778	12 vs. 1	1550.154	11	0.000
13. Four-factor model 1	5381.864	224	24.026	0.243	0.138	0.619	0.570	13 vs. 1	4096.093	15	0.000
14. Four-factor model 2	4081.521	224	18.221	0.210	0.126	0.715	0.678	14 vs. 1	2795.75	15	0.000
15. Four-factor model 3	4530.523	224	20.226	0.222	0.142	0.682	0.641	15 vs. 1	3244.752	15	0.000
16. Four-factor model 4	4160.147	224	18.572	0.212	0.144	0.709	0.672	16 vs. 1	2874.376	15	0.000
17. Three-factor model 1	6162.903	227	27.149	0.259	0.138	0.561	0.511	17 vs. 1	4877.132	18	0.000
18. Three-factor model 2	6620.728	227	29.166	0.269	0.153	0.528	0.473	18 vs. 1	5334.957	18	0.000
19. Three-factor model 3	6241.169	227	27.494	0.261	0.152	0.556	0.505	19 vs. 1	4955.398	18	0.000
20. Two-factor model 1	7312.431	229	31.932	0.282	0.148	0.477	0.422	20 vs. 1	6026.66	20	0.000
21. Two-factor model 2	7005.491	229	30.592	0.275	0.151	0.499	0.447	21 vs. 1	5719.72	20	0.000
22. Single factor model	8120.935	230	35.308	0.297	0.156	0.417	0.359	22 vs. 1	6835.164	21	0.000
23. Removal of mediators (six-factor model)	4516.673	220	20.530	0.224	0.322	0.683	0.635	23 vs. 1	3230.902	11	0.000
24. Removal of mediators (single factor model)	6388.496	135	47.322193	0.345	0.243	0.362	0.277	24 vs. 23	1871.823	-85	0.000
Benchmark model: Sociability, Personalization, Recommendation, Perceived Usefulness, Perceived Ease of Use, Motion Persistence											

Fitting Index	χ^2	df	χ^2/df	RMSEA	SRMR	CFI	TLI	Comparison of models			
								Model Comparison	Dc2	Ddf	P
Intention, Sports Circle Culture;											
Six-factor model 1 to 6: On the basis of the benchmark model, the SCC, SC, PL, RC, PU, PEU and MPI were successively merged into a new factor;											
Five-factor Model 1 to 5: On the basis of the benchmark model, the SCC and SC were combined to form a new factor, and the new factor was combined with one of the other five factors (PL, RC, PU, PEU and MPI) to make a five-factor model analysis.											
Four-factor model 1 to 4: On the basis of the benchmark model, the SCC, SC and PL are combined to form a new factor, and the new factor is combined with one of the other four factors (RC, PU, PEU and MPI) to make a four-factor model analysis.											
Three-factor model 1 to 3: On the basis of the benchmark model, the SCC is combined with SC, PL and RC to form a new factor, and the new factor is combined with one of the other three factors (PU, PEU and MPI) to make a three-factor model analysis.											
Two-factor model 1-2: On the basis of the benchmark model, the SCC was combined with SC, PL, RC and PU to form a new factor. The new factor and one of the other factors (PEU and MPI)) were merged into a new factor for two-factor model analysis.											
Single-factor model: SC, PL, RC, PU, PEU, MPI, and SCC were combined into one factor.											

5.2 Model Hypothesis Testing

In this study, Mplus8.3 software is used to conduct structural equation modeling, and the relationship between variables is verified. The path analysis results were shown in Table 7 and Figure 3. The standardized path coefficients corresponding to H1a, H2a, H2b, H3a, H4 and H6 are −0.135, 0.128, 0.193, 0.143, 0.192 and 0.312, respectively, with P values<0.05, indicating that the hypothesis is significantly valid. Among them, sociality and perceived usefulness (Z=−4.477, P < 0.001) indicate that the perceived intensity of social performance is inversely correlated with perceived usefulness, and the reverse hypothesis holds. In addition, the effect of sociality on perceived ease of use (Z=−0.796, P=0.426) indicates that the effect of social performance intensity on perceived ease of use is not obvious, and it has a certain weakening effect on the functional strength of perceived ease of use. Perceived usefulness on exercise persistence intention (Z=1.602, P=0.109) indicates that products and services such as social platforms and smart wristbands do not significantly enhance users' exercise intention. Even if users' sense of achievement is not too obvious, it indicates that the degree of attention to personal privacy data is stronger than that of external performance. It indirectly indicates that people in modern society have a deeper fear of social interaction. In H7 hypothesis, the moderating effect of the cultural factors of the exercise circle is significantly and positively correlated with the other latent variable parameters, except that the effect on enhancing the users' exercise persistence willingness is not significant. Combining the results of the dual effects of sociability with perceived usefulness and ease of use, this paper draws the following conclusions: The sports circle culture has a positive moderating effect on the relevant parameters of the model, and plays a role in enhancing the user experience, which indicates that the human identity of the sports circle culture in modern society is much higher than the perception of the unfamiliar environment, that is, the sports social group tends to the aggregation effect of the cultural identity of the same sports circle. Of course, from the path coefficient analysis results, it can be concluded that among the cultural characteristics indicators of the sports circle, the circle group focuses more on the personalization and recommendation related behaviors, but does not pay attention to the intensity of social performance. The above conclusions show that the same circle culture has a sense of identity and at the same time has the consideration of ensuring personal privacy security.

Table 8 and Figure 4 respectively show the regression analysis results of the research model on each factor relative to the willingness to exercise persistence and the output of the result model. It can be seen from the results that perceived usefulness has no significant effect on the regression of the continuation state of the Motion Persistence Intention, and the culture of the sports circle has a significant but negative impact on the continuation state of the Motion Persistence Intention. The regression coefficients of the other factors show that the influence effects are significantly correlated, and the perceived ease of use can improve the movement continuity of smart bracelet users based on social platforms, which indicates that modern users are more inclined to simple communication, simple operation and simple acceptance with the diversified demands of scientific and technological products and services. Therefore, this paper believes that the development trend of science and technology should be more concise, efficient and practical.

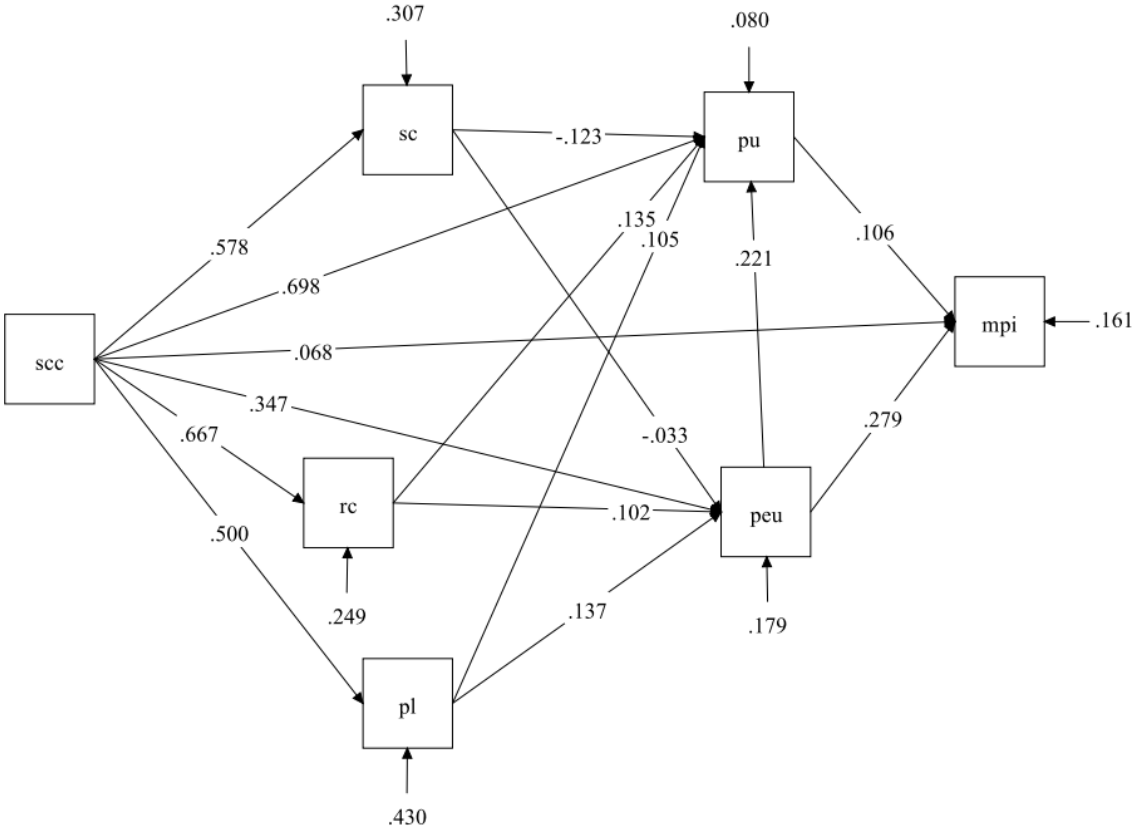

Figure 3 Path test coefficients of the output structural equation model

Table 7 Test results of the mediating moderating effect of the model

Paths	**Unstd.**	**S.E.**	**Z**	**P**	**Std.**
SC→PU	-0.123	0.027	-4.477	0.000	-0.135
PL→PU	0.105	0.023	4.523	0.000	0.128
RC→PU	0.135	0.030	4.511	0.000	0.143
PEU→PU	0.221	0.034	6.536	0.000	0.192
SCC→PU	0.698	0.038	18.184	0.000	0.661
SC→PEU	-0.033	0.041	-0.796	0.426	-0.041
PL→PEU	0.137	0.034	4.031	0.000	0.193
RC→PEU	0.102	0.044	2.292	0.022	0.124
SCC→PEU	0.347	0.055	6.343	0.000	0.379
PU→MPI	0.106	0.066	1.602	0.109	0.136
PEU→MPI	0.279	0.050	5.570	0.000	0.312
SCC→MPI	0.068	0.065	1.050	0.294	0.083
SCC→SC	0.578	0.051	11.379	0.000	0.499
SCC→PL	0.500	0.060	8.321	0.000	0.388
SCC→RC	0.667	0.046	14.587	0.000	0.594

Table 8 Regression results

MPI regression	**Unstd.**	**S.E.**	**Est./S.E.**	**P-Value**	**Std.**
SC	0.190	0.038	5.057	0.000	0.268
PL	0.098	0.032	3.085	0.002	0.154
RC	0.111	0.041	2.725	0.006	0.152
PU	0.094	0.068	1.384	0.167	0.121
PEU	0.250	0.048	5.258	0.000	0.280
SCC	-0.141	0.070	-2.026	0.043	-0.172
Intercepts	1.957	0.215	9.120	0.000	
R-SQUARE	0.305	0.039	7.849	0.000	

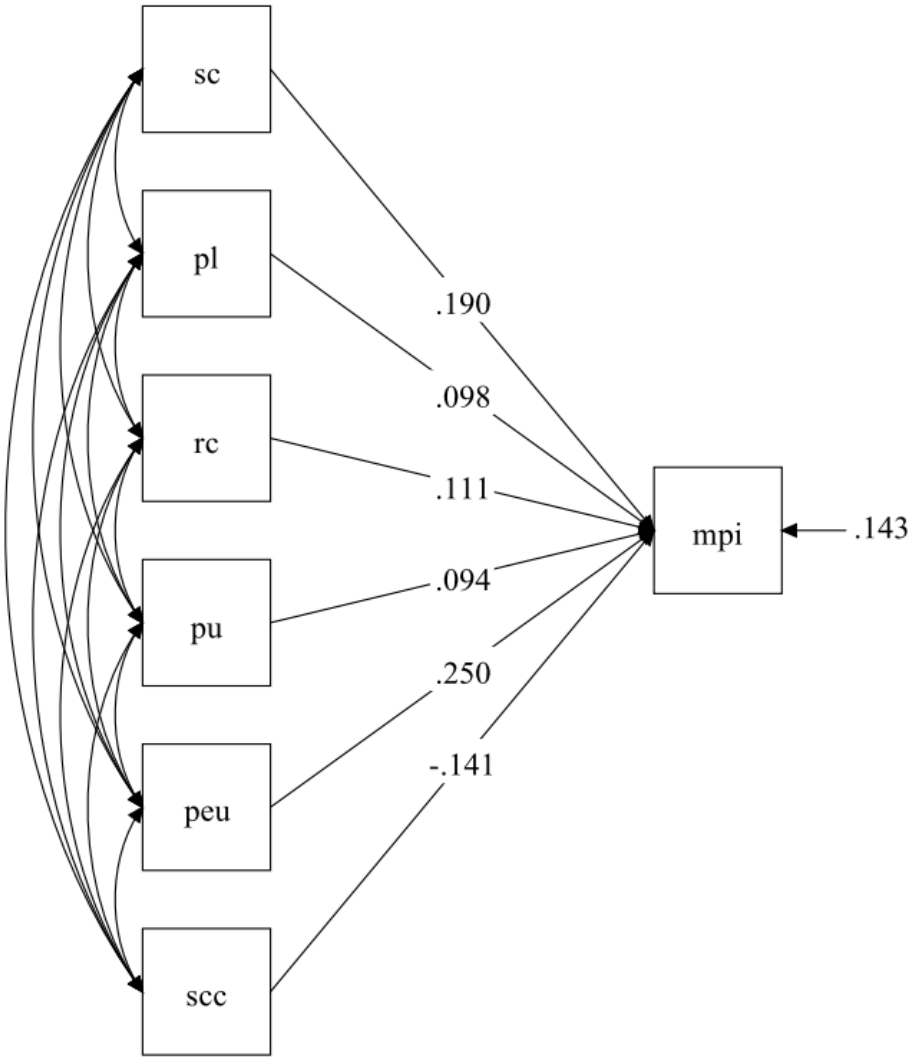

Figure 4 Output results of regression model

From the above regression results, it can be seen that for sociability, personalization and recommendation, the effect of sociability enhancement model is not significant, and there is a certain inhibitory effect. This research conclusion verifies that the social problems of human modernization tend to be more in the era of personalization, and the results derived from science and technology drive groups to pursue personalization. In addition, recommendation is also an important factor affecting the Motion Persistence Intention, which verifies the high utilization and popularity of social platforms such as new social video platforms such as Tik Tok and BiliBili. The concept of sports circle culture does not significantly enhance the extension of the willingness to continue sports. However, according to the path analysis, it can be found that it has a significant enhancing effect on the other five latent variables. This conclusion indirectly verifies the above analysis conclusion: it is difficult for modern groups to accept the relative exposure of personal privacy except for the cultural identity of the sports circle to which they belong. Therefore, the sports circle culture promotes the enhancement of the communication experience of groups within the circle while inhibiting the communication experience of different cultural groups within the same circle. In addition, perceived ease of use has a significant effect on enhancing the Motion Persistence Intention, and perceived ease of use also has a significant effect on enhancing perceived usefulness. This result shows that the communication mode of modern social groups tends to be simple and concise, and human cognition is gradually replaced by the initiative of technology-derived results, and the cognition tends to be more identical. In short, it is more eager to achieve ready-made results than to enhance personal innovative development.

According to the above research results, the regression equation of the sports circle culture relative to the continuous willingness to exercise based on the social platform is finally obtained. The equation is as follows:

MPI=1.957 + 0.190SC + 0.098PL + 0.111RC + 0.094PU + 0.250PEU + (−0.141) SCC, and the residual error of the regression equation is 0.143.

5.3 Test of Moderating Effect of Cultural Bias in Sports Circle

The moderating effect of sports circle culture is tested in groups. The biased moderating effect of sports circle culture on path influence is considered, and the biased moderating effect of sports circle culture on perceived usefulness and perceived ease of use is considered respectively. The biased effect of SCC on PEU→PU is selected respectively to verify whether Hypothesis H4 is valid. The biased influence of SCC on PU→PEU is selected to obtain the structural relationship among perceived ease of use, perceived usefulness and intention to continue exercise (as shown in Tables 9 and 10). At the same time, the analysis of the moderating effect of the cultural factors in the sports circle confirms that H7 is valid. INT=0.056, P=0.205, and the P value is much greater than 0.05, indicating that the moderating effect of bias influence is not significant. INT=0.252, P=0.000 in the corresponding perceived ease of use index of sports circle culture, indicating that the moderating effect of bias influence is 0.252, which is significant.

Table 9 Moderating effect of Sports Circle Culture on Perceived Usefulness bias

Mediating moderating variable	Perceived Usefulness	Effect	S.E.	95%CI
Sports Circle Culture	M-1SD -1	0.025	0.012	[0.002,0.048]
Sports Circle Culture	M 0	0.035	0.013	[0.010,0.061]
Sports Circle Culture	M+1SD 1	0.046	0.019	[0.008,0.083]

Note: The confidence interval is 95%.

Table 10 Moderating effect of Sports Circle Culture on Perceived Ease of Use bias

Mediating moderating variable	Perceived Usefulness	Effect	S.E.	95%CI
Sports Circle Culture	M-1SD -1	0.096	0.029	[0.039,0.152]
Sports Circle Culture	M 0	0.158	0.038	[0.083,0.232]
Sports Circle Culture	M+1SD 1	0.220	0.053	[0.115,0.324]

Note: The confidence interval is 95%.

According to the above verification results, it can be concluded that the moderating effect of sports circle culture on perceived usefulness bias is not significant. However, this factor has a significant moderating effect of bias on perceived ease of use, and positively affects the degree of perceived ease of use. Therefore, product providers or service mainteners should choose to pay attention to or appropriately intervene in the cultural characteristics in the cultural field of the sports circle, and refine products and service situations that are more satisfactory to users, so as to obtain more loyal customer groups and development opportunities in related fields.

6 Research Conclusions

Firstly, this paper expounds the connotation of the cultural concept of the relevant sports circle, describes the legend of the sports circle and explains the relevant influencing factors, and makes corresponding analysis. On this basis, the survey sample statistics survey is carried out, and the demographic characteristics of the sample scale are given.

Secondly, this paper conducts an investigation and evidence collection research on the exercise usage intention of smart bracelet users based on social platform. This research model introduces the cultural connotation factors of the sports circle to analyze the corresponding bias influence, systematically demonstrates the change state of technical elements under the influence of the cultural factors of the sports circle, and whether the positive moderating effect of each technical element on users' perceived usefulness and perceived ease of use is significant. Combined with the hypotheses and the research conclusions, it can be seen that A. The cultural factors of the sports circle (SCC) have a significant but negative impact on the exercise persistence intention (MPI), and the moderating effect on the perceived usefulness (PU) bias is not significant, and the overall impact is not significant.

Therefore, it is hypothesized that the moderating effect of H7 presents significant characteristics on the moderating path, and the moderating effect is positively correlated. b. In the analysis of technical factors, the path coefficients of sociability, personalization and recommendation correspond to perceived usefulness and perceived ease of use. Among them, Hypothesis H1b can be expressed as that sociability acts inversely on perceived ease of use. In addition, there is a significant positive correlation between personalization and recommendation, among which the influence coefficient of personalization index is the most prominent, while the influence coefficient of recommendation on perceived ease of use is small. c. The influence coefficient of perceived usefulness on the path of exercise persistence intention is not significant, that is, H5 is inversely true. d. Perceived ease of use positively affects the continuation of exercise persistence intention, and the path coefficient is significantly positively correlated, that is, H6 is established. e. Hypothesis H4 holds in reverse, that is, perceived usefulness positively affects perceived ease of use, while perceived ease of use has no significant effect on perceived usefulness efficacy indicators. f. The analysis of the influence effect of cultural factors on perceived usefulness and perceived ease of use in the sports circle can be concluded, as shown in Figure 5.

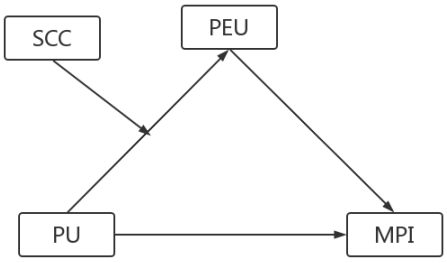

Figure 5 Influence of cultural elements of the sports circle on the effective bias of Perceived Ease of Use

Thirdly, according to the conclusion, it can be seen that the sports circle culture has a multi-dimensional and highly adaptive moderating effect on the sports persistence willingness model; Group members of the sports circle pay more attention to personalized needs and recommended sharing experience, and group members pay more attention to personal privacy and are not willing to share personal experience. Based on this research, it can be found that the level and effectiveness of the privacy mechanism of social platforms will bring more users in the future, and the virtual environment effect can increase the user experience pleasure more. In addition, the conclusion shows that high perceived ease of use can bring more superposition effect of exercise persistence intention to users, and promote users to obtain better experience.

Finally, this paper argues that manufacturers or providers of social platforms and smart wearable devices that provide products and services should pay more attention to the personalized needs of users and strive to improve the secrecy and personalization level of products and services. Strive to make the products and services provided by it more simple, fast, safe and efficient, the future competition must be the products and services with higher audience level win. Therefore, this paper believes that the result of the progress of science and technology and civilization is to develop towards the superposition of multiple elements such as efficiency, simplicity, intelligence and security.

7 Research Contribution Is Insufficient

The main research contribution of this paper is to provide a path analysis of the influence of cultural elements in the sports circle on users' perceived usefulness and perceived ease of use. At the same time, it provides some reference for the interpretation of connotation factors of cultural elements in the follow-up sports circle. The above-mentioned follow-up research directions are also the shortcomings of this paper, that is, the connotation of each element of the movement circle element should be explored in the follow-up research, so as to stratifying and categorizing the circle group and exploring the strength of the model adjustment effect between different circles and between different levels within the circle. In addition to the above contents that need further discussion and analysis, this paper can be regarded as one of the main contributions to the research on the influencing mechanism of sports circle culture on the willingness to continue sports at the present stage.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to containing information that could compromise the privacy of research participants.

ORCID

Xing Manjiang: http://orcid.org/0000-0003-1835-5590

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