Volume: 5, Issue: 8
Page: 46-72
2021

International Journal of
Science and Business
Journal homepage: ijsab.com/ijsb

IJSAB International

The influence of Consumers' Purchase intention on Smart Wearable Device: A study of Consumers in East China

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Abstract

In order to better analyze the influencing factors of consumers' purchase intention of smart wearable devices, this paper uses the technology acceptance model as the theoretical basis, and selects the factors that may have a greater impact on the purchase intention of smart wearable devices as the investigation project. By constructing a theoretical analysis model of consumers' purchase intention of smart wearable devices, interpret the relationship between the key variables of smart wearable devices and the influence of consumers' purchase intention, verify the credibility of various assumptions, and propose the development path of China's smart wearable industry based on the research and analysis results. Specifically, the research contents include the following: (1) According to relevant theories and literature analysis, screen out the influencing factors that affect the usefulness and ease of use of smart wearable devices, and under the framework of the technology acceptance model, analyze the explanatory relationship of the influencing factors that affect consumers to purchase smart wearable devices from two aspects: perceived ease of use and perceived usefulness. (2) With the help of investigation and statistical analysis, the correlation between independent variables and dependent variables that affect the purchase intention of smart wearable devices is discussed. (3) Starting from the personal characteristic attributes of consumers such as age, gender, educational background and income level, the differences between the personal characteristic attributes of consumers and the purchase intention of consumers of smart wearable devices are discussed. The path relationship between independent variables and dependent variables shows that the theoretical analysis model of the purchase intention of smart wearable device consumers constructed in this paper can better analyze the internal influence of the factors affecting the purchase intention of smart wearable device consumers, and help smart wearable device manufacturers and intermediate service providers better understand the key factors affecting the purchase intention of smart wearable device consumers, and guide their product development and marketing activities.

IJSB
Accepted 12 May 2021
Published 16 May 2021
DOI: 10.5281/zenodo.4765601

Keywords: *Smart wearable device, Technology acceptance model, Perceived ease of use, Perceived usefulness, Purchase intention.*

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INTRODUCTION

Industry Background of Smart Wearable Devices

With the increasing commercial use of mass technology products, especially the opening of 5G high-speed network applications, more and more innovative technology products are used by consumers, and the application research of technology acceptance models will return to the public's vision in the future. However, the biggest problem in the application of new technologies is whether new technology products can be accepted and used by consumers. Therefore, new research on technology acceptance models in various fields has become a hot topic in management. Smart wearable device is a portable device that is worn directly on the body or integrated into the user's clothes or accessories. It is not only a hardware device, but also realizes powerful functions through software support, data interaction and cloud interaction. Wearable device will bring great changes to our life and perception. The concept of smart wearable devices was first put forward by foreign scholars in the 1960s. Limited by the level of science and technology at that time, the research stayed on the theory and form of smart wearable devices. In the 21st century, with the rapid development of technology, smart wearable devices began to show their unique charm and magical functions to people. Especially since 2005, the concept of smart wearable devices has continued to be hot. Some famous foreign universities, such as Massachusetts Institute of Technology and Stanford University, have set up research groups and laboratories one after another to invest a lot of money every year to explore this field. Some well-known domestic enterprises, such as Ali, Baidu, Huawei and Xiaomi, have also invested heavily in the industry and carried out a number of research and development projects on smart wearable devices. As one of the inventions and expansions of intelligent technology closely related to human life, the emergence and extensive expansion of smart wearable devices are changing the way of human life. In 2006, Nike and Apple teamed up to launch the Nike + iPod - a sports kit that combines a portable music player with a smart pedometer, marking the first step in mobile health tracking of wearables. In 2009, Fitbit launched its first product, the Fitbit Tracker, a thumb-sized "pedometer" that quickly set off an exercise and fitness craze in North America. In 2012, the smart wearable industry entered the era of rapid development in which a hundred flowers bloom and a hundred schools of thought contend, attracting global attention to the smart wearable industry. After 2014, the world's major companies entered the stadium, accelerating the landing of wearable devices in various industries. From 2014 to 2018, Google launched an Android Wear system specially used in wearable devices. Xiaomi and Huami jointly launched the "Mi Band" and Apple launched the Apple Watch, which provides more in-depth application services in sports and health scenes and provides more powerful heart rate tracking functions. In 2018, Apple Watch intensified its exploration in the health field, and its electrocardiogram (ECG) intelligent monitoring product was certified by the U.S. Food and Drug Administration. In the domestic market, Huami Technology has followed Apple's footsteps with the introduction of a new watch series AMAZFIT, which enhanced exercise and health functions and can monitor heart rate changes around the clock. In addition, in the health field, the smart watch Huawei Watch GT series is equipped with , namely TruSeen 3.0 heart rate monitoring function to monitor heart rate and sleep quality in real time. At present, the shipments of smart wearable products in the Chinese market have entered a period of rapid development. Especially under the background of the 2020 epidemic, smart wearable products have shown their technological advantages in the control of home isolation personnel and the health intelligent monitoring of the left-behind elderly, helping to fight the epidemic and giving smart wearable products a special historical mission. With the gradual popularization of 5G networks, the research and development and promotion of smart wearable devices in China has entered a period of rapid upsurge. IDC's "China Wearable Device Market Quarterly Tracking Report (Third Quarter in 2019)" shows

that China's wearable device market shipped 27.15 million units in the third quarter of 2019, up 45.2% year-on-year. Among them, the largest increase was in smart bracelets, smart watches and other devices, with an increase of 86.3%. Judging from the figures, China's smart wearable device market is still a blue sea, and the market scale still has a lot of room for improvement. In the next five years, the production and demand of China's smart wearable devices will further increase, and China's smart wearable market has become an emerging market force that cannot be ignored. However, the characteristics of people's consumption demand for smart wearable devices and the key influencing factors for consumers to purchase smart wearable devices are urgent issues for industrial development.

Description of research questions

The Technology Acceptation Model (TAM) is proposed based on the theory of reasoned behavior (TRA). It is widely used in information system research and can help understand people's cognition or acceptance of information technology. Extensive empirical research has been carried out abroad, but its application in China is less and its scope is limited. Based on the TAM model theory, this paper discusses the consumer's attitude towards smart wearable devices, their demand and the influencing factors of their selection system, evaluates the consumer's acceptance of smart wearable devices, and establish a theoretical model of the factors influencing consumers' acceptance of smart wearable devices, and then put forward specific suggestions, hoping to provide some references for the development and management of China's smart wearable industry. Based on this, the research questions in this paper are as follows:

Question 1: What are the main variables that affect the ease of use of smart wearable devices and what are the main variables that affect the usefulness of smart wearable devices? Into which explanatory factors can these variables be classified, and what is the degree of explanation of the survey question items of these influencing factors on the original variables?

Question 2: Do consumers' personal characteristic attributes such as gender, age, educational background, income status and other factors affect their willingness to purchase and use smart wearable devices, and do these personal characteristic attributes have significant differences in their willingness to purchase smart wearable devices?

Research Objectives

To better analyze the influencing factors of consumers' purchase intention of smart wearable devices, this paper uses the technology acceptance model as the theoretical basis, and selects the factors that may have a greater impact on the purchase intention of smart wearable devices as the investigation project. By constructing a theoretical analysis model of consumers' purchase intention of smart wearable devices, interpret the relationship between the key variables of smart wearable devices and the influence of consumers' purchase intention, verify the credibility of various hypotheses, and propose the development path of China's smart wearable industry based on the research and analysis results. Specifically, the research objectives include the following:

Research Objective 1: To investigate the degree of explanation of the variance of the original variables by the questioned items. According to relevant theories and literature analysis, various influencing variables that affect consumers' purchase of smart wearable devices are screened out, an analysis survey scale of various variables is constructed, and the explanatory ability of various survey items on the purchase intention of smart wearable devices to the original variables is discussed, which provides support for completing the analysis of smart wearable devices.

Research Objective 2: Differential analysis of consumer purchase intention. Starting from the characteristic attributes of consumers, the differences between the personal characteristic attributes of consumers such as gender, age, educational background, income status and the purchase intention of smart wearable device consumers are discussed.

LITERATURE REVIEW

Consumer Purchase Intention

Purchase intention refers to whether a consumer is willing to buy a product at a balanced market price under the condition that the consumer's monetary income is established. Consumer purchase intention refers to the probability that the consumer is willing to take a specific purchase behavior.

Preliminary study

Mitchell(1999) believed that the consumer's attitude towards a certain product or brand, combined with the effect of external factors, constitutes the consumer's purchase intention. The purchase intention can be regarded as the subjective tendency of consumers to choose specific products, and has been proved to be an important indicator for predicting consumer behavior. Juliet, B. (2010) argues that purchase intention refers to the subjective probability or likelihood that a consumer will purchase a particular product, while some scholars argue that purchase intention is the consumer's purchase plan for a particular good. Zhou (2020) considered purchase intention as the possibility of consumers to buy the product, and he constructed a research model and proposed hypotheses by studying the theory based on technology acceptance model, then designed and collected questionnaires and tested them using SPSS and Amos statistical software, and finally constructed a structural equation model path diagram. The empirical results enrich the theoretical results and practical value of the research on the influence of consumers' purchase intention. Wang and Gao (2020) believe that the purchase intention is a psychological consultant for consumers to buy goods suitable for their own needs, a manifestation of consumer psychology and a prelude to purchase behavior. Based on the stimulus-organism-response theory, he studied the influence of individual consumer behavior characteristics on purchase intention in the online shopping environment by influencing consumers' cognition, experience and psychological characteristics. Research shows that information involvement, network closeness and individual innovation have significant positive effects on purchase intention, while perceived risk has significant negative effects on purchase intention. Perceived risk is divided into functional risk and emotional risk. Individual innovation plays a regulatory role in the influence path of functional risk and emotional risk on purchase intention, and functional risk and emotional risk play a part mediating role in the overall model. Hu, Shi, Yu, Mao, et al. (2021) constructed an extended technology acceptance model by introducing three potential variables: perceived risk, service quality and social impact. Then, the latent variables, personal socio-economic attribute variables and travel mode attribute variables of the extended technology acceptance model are integrated into multiple Logit models, a hybrid selection model is constructed, and the probability of users choosing to share self-driving cars to travel is used to measure the user's purchase intention of using shared self-driving cars.

Software and Hardware Design of Smart Devices

The software of smart device is a logical product, which is essentially different from hardware products. Hardware is a visible and tangible physical component or device. When developing hardware products, people's creative activities are manifested in transforming raw materials into tangible physical products. Software products exist in the form of programs and documents, and their role is reflected by running on computers. The design of smart wearable

products includes the design of software and hardware functional modules of smart wearable devices. Whether the design of smart wearable products meets the needs of consumers is the main basis for consumers to be willing to purchase and try to use smart wearable devices. The design of software and hardware functional modules of smart wearable devices mainly includes the quality level of functions and performance of smart wearable products produced by research and development and production enterprises according to the needs of market consumers. If the quality is good, the evaluation of consumers' perceived usability and perceived usefulness will be improved. At the same time, their willingness to purchase will be improved, and the possibility of final purchase behavior will be higher.

Previous research on the relationship with independent variables

According to research by Wang, Liang, Fan, Deng, et al. (2017), the coexistence of software and hardware devices is the biggest difference between intelligent devices and traditional products. To this end, based on the technology acceptance model (TAM) and the characteristics of consumers' online car-booking travel behavior, he constructed a theoretical model of the influencing factors of consumers' online car-booking travel, and completed the influencing factors of online car-booking software through sample surveys. The results show that: subjective norms, usage feelings, and software design level have an impact on perceived usefulness, of which perceived price level negatively affects perceived usefulness; self-efficacy, perceived external control, and perceived pleasure have a positive impact on perceived usability; perceived usability positively affects perceived usefulness; perceived usability and perceived usefulness positively affect users' travel intentions. Huang (2019) extends and proposes the Senior Technology Acceptance Model (STAM) on the basis of the theory of technology acceptance model, and proposes the importance of software to smart device. He developed a structured questionnaire based on the variables of the new technology acceptance model, conducted research and interviews to understand the attitudes and intentions of the elderly towards smart home appliances, summarized the problems of using smart home appliances among the elderly, and collected relevant statistical data. He used the Structural Equation Model (SEM) to analyze the effects of four core elements of product design: product function, software function design, product appearance, and interaction interface on perceived usefulness, perceived ease of use, perceived pleasure, perceived safety, behavioral intention, and system use. Based on the technology acceptance model, Wei Ling and Guo Xinyue (2020) regarded users' willingness to continuously use knowledge payment platforms as a performance under the stimulus-organism-response (S-O-R) model, and based on the usability and convenience of software design, proposed that perceived value, immersion experience, perceived usefulness, and perceived ease of use significantly influenced consumers' willingness to continuously use, and then, they put forward relevant suggestions for platform operators based on this conclusion.

Theory of Reasoned Action comes from social psychology and is considered as one of the most basic and influential theories to study cognitive behavior. This theory fully illustrates the influence of motivation and information on behavior. This model can be regarded as a deliberate process model, because they represent the behavioral decisions made by individuals after careful consideration based on available information. This theory suggests that people tend to follow a reasoned action that enables them to obtain favorable outcomes and to conform to others. it arose from a study of mental processes done by Feishbein and was discovered by Feishbein when he analyzed the failure of attitudes to predict behavior. Due to the openness and conciseness of TRA, it is believed that it can further deepen the research or be added other predictive variables, and many scholars have conducted extensive research on it. According to the different research topics and emphases, these existing TRA

expansion studies can be classified into three categories: theoretical deepening research on the perfection of TRA theory itself; expansion research on the applicability of TRA with situational variables; and model expansion research that incorporates new variables into TRA models. The significance of this theory lies in that it illustrates two basic hypotheses: first, attitude and subjective norms are mediating variables that affect behavior tendency by other variables; second, behavior intention is a mediating variable that affects behavior by attitude and subjective norms. Some researchers believe that adding other structures to the TRA model will reduce the refinement of the TRA model. Therefore, a common extension study is to further study the variables contained in the TRA. These studies mainly include three types, namely, in-depth research on the attitude toward behavior dimension, in-depth research on the subjective norm dimension, and in-depth research on attitude toward behaviors, which are hot spot in the extension study of TRA itself. From the existing studies, there are two main types of studies that focus on the division of attitude toward behaviors.

METHODOLOGY

Objectives of investigation

1. With the help of investigation and analysis, analyze the influence factors and relationships of consumers using smart wearable products from two aspects of perceived ease of use and perceived usefulness;

2. Verify the authenticity of the 13 basic hypotheses proposed in this paper, and complete the key factors affecting the promotion and application of smart wearable products with empirical analysis.

Questionnaire Design

The design of smart wearable products includes the design of software and hardware functional modules of smart wearable devices. Whether the design of smart wearable products meets the needs of consumers is the main basis for consumers to be willing to purchase and try to use smart wearable devices. As a new high-tech intelligent product, it is very important for consumers to fully understand the functional characteristics and usage methods of smart wearable products in the shortest possible time. With the help of publicity, promotion and education and training on the service functions of smart wearable devices, consumers' awareness of smart wearable device software can be improved, thus enhancing consumers' willingness to purchase smart wearable devices. In order to complete the above analysis, this study intends to complete the collection of required data through questionnaire survey. The design of questionnaire items mainly refers to the design description of relevant questionnaires, and is compiled according to the research purpose and research hypotheses. The questionnaire is divided into five parts, The first part is the investigation of the influence of smart wearable product design, publicity and education and consumer service on consumers' perceived ease of use and perceived usefulness; The second part is the investigation of the influence of consumers' subjective norms, innovation characteristics and perceived risks on their perceived ease of use and perceived usefulness; The third part is the investigation of perceived ease of use to perceived usefulness, perceived ease of use and perceived usefulness to consumers' intention to use; The fourth part is a survey to understand consumers' intention to use smart wearable products, thereby completing the analysis of consumers' intention to use smart wearable products and the relationship between various factors. The fifth part is the personal data of consumers, including four questions such as gender, age, educational background and income level.

Population / Sampling / Unit of Analysis

According to the previous description, consumers' attitude towards smart wearable devices has a great influence on their purchase intention. Previous scholars have applied the technology acceptance model to a very large number of research areas, and this paper is mainly based on previous studies, with modifications made in this specific context to fit the purpose of the study, so the scale design mainly refers to the studies of Davis (1986), Ajzen (2006), and others, who provide more detailed measurement scales.

Reliability and validity test scheme

In this study, after the completion of the design of the first draft of the questionnaire and before the formal test, in order to understand whether the questionnaire design is perfect and to test the reliability of the questionnaire, to avoid semantic problems in the content of the questionnaire, which leads the respondents to misunderstand the meaning of the questionnaire and answer the questionnaire by mistake, the questionnaire will be pre-tested in advance and the non-significant items will be deleted. This study mainly implements reliability analysis in the process of questionnaire pre-test analysis. Cronbach's alpha is used to measure the consistency and stability of the entire questionnaire item. The higher the number of alpha coefficients, the higher the internal consistency of the scale. According to Nunnally, reliability above 0.7 is considered reliable; Cuieford believes that Cronbach's alpha greater than 0.7 is considered as high reliability, between 0.7 and 0.35 is considered as fair reliability, and less than 0.35 is considered as low reliability and should be rejected. Based on the pre-test items of the questionnaire, the formal questionnaire was distributed after appropriate revision. In order to discuss the influence of survey items on intention to use, this study conducts factor analysis for perceived usefulness, perceived ease of use, software design, publicity and education, consumer service, subjective norms, innovation characteristics, perceived risks and purchase intentions. Before conducting factor analysis, the statistical values were first tested with the help of KMO test to determine the suitability of the sample information for factor analysis in this study.

Data collecting process

Sample source

This study focuses on consumers in East China as the survey target. The intention to use smart wearable devices such as smart bracelet products is the survey content, and the comprehensive discussion of consumers' intention to use smart wearable products and its influencing factors is completed. The survey sites are generally chosen from electronic shopping centers, electronic product counters in large commercial buildings, and specialized stores of related brands.

Investigation arrangements

This study mainly takes the first-tier and second-tier urban residents in East China as the measurement objects. Due to the impact of the epidemic, this survey chooses the network survey as the main method and the on-site survey as the auxiliary method. The questionnaire was prepared by Questionnaire Star and distributed to the consumers of well-known digital electronic stores network mall with the help of network WeChat group and QQ group, who filled in the questionnaire online, and the questionnaire was collected simultaneously.

From September 25 to October 30, 2020, 737 questionnaires were collected, 7 invalid questionnaires were removed, and 731 valid questionnaires were collected. According to the suggestion of Hair et al. (2006), the sample size should be at least 5 times of the questions, and 10-20 times is the best. The questionnaire items in this study are 9 types with a total of

29 questions, and 731 valid questionnaires have been obtained. Therefore, the sample size of this study is appropriate.

Table 3.1 Distribution of survey sample sources

	Distributed	Collected	Effective	Total number of valid questionnaires
On site	327 copies	319 copies	313 copies	731 copies
Web-based approach			419 copies	

Findings

In this study, there are 4 demographic variables including gender, occupation, age and educational background. The statistical data analysis of the survey sample is shown in Table 4.1.

Table 4.1 Characteristic analysis of sample data

Name	Options	Frequency	Percentage (%)
Gender	Female	342	46.79%
	Male	389	53.21%
Educational background	High School and below	167	22.85%
	Undergraduate or specialist degrees	431	58.96%
	Master and above	133	18.19%
Age	Under 25 years old	214	29.27%
	26-40 years old	157	21.48%
	41-55 years old	122	16.69%
	Over 56 years old	238	32.56%
Monthly salary level	6,000 and below	104	14.23%
	6,000 to 10,000	247	33.79%
	10,000 to 15,000	256	35.02%
	15,000 and above	124	16.96%
Total		731	100.00%

1. Gender: In terms of gender distribution, 389 respondents were male, accounting for 53.21%; There were 342 women, accounting for 46.79%. From the above statistics, we can see that the difference between men and women is not obvious in terms of consumption of smart wearable devices.
2. Educational background: In terms of educational background, 58.96% of the respondents have undergraduate or specialist degrees; 133, or 18.19%, have postgraduate degrees or above; 167 people have high school degree or below, accounting for 22.85%. From the above statistics, those with undergraduate or specialist degrees or above are the main consumer groups of smart wearable products.
3. Age: In terms of age distribution, 214 people are under 25 years old, accounting for 29.27%; There are 157 people aged 26-40, accounting for 21.48%. There are 122 people aged 31-55, accounting for 16.69%. There are 238 people over 56 years old, accounting for 32.56%. From the above statistics, people over 56 years old and people under 25 years old are the main consumer groups of smart wearable products.
4. Monthly wage level: in terms of income level, the proportion of consumers with monthly income below 6,000 yuan is 14.23%; Consumers with monthly income of 6,000 to 10,000 accounted for 33.79%. Consumers with monthly income of 10,000 to 15,000 accounted for 35.02%. Consumers with monthly income of 15,000 and above accounted for 16.96%. From

the above statistics, consumers with a monthly income of 6,000 to 15,000 are the main consumer groups of smart wearable products, and the proportion of consumers with a monthly income of less than 6,000 yuan is not high.

Objective 1: To explore the variance explanation degree of influencing factors to the original variable

In this study, factor analysis was conducted for nine survey items, including perceived ease of use, perceived usefulness, device hardware and software design, device service system, device training and promotion, consumer subjective norms, consumer perceived risk, consumer innovative traits, and consumer purchase intention, and according to the adoption criteria advocated by Kaiser (1958), common factors with extracted eigenvalues greater than 1 were retained, and the question items with absolute values of factor loadings greater than 0.5 were retained.

Dependent Variable D: Test and analysis of the results of the survey on consumer purchase and use Intention

1. Reliability analysis

The dependent variable consumer purchase intention to use has three question items, D11: I think it is valuable for me to buy smart wearable devices; D12: I think it is wise for me to buy smart wearable devices; D13: I think it is very helpful for my life to buy smart wearable devices. In order to investigate the quality of the survey results of the three questions, the reliability analysis of the survey results of these three questions is first carried out. The analysis results are as follows in Table 4.2.

Table 4.2 Reliability analysis of consumer purchase intention survey questions

Question item	Corrected Item-Total Correlation (CITC)	Cronbach's Alpha if Item Deleted	Cronbach's alpha coefficient
D11	0.883	0.867	
D12	0.859	0.886	0.907
D13	0.811	0.904	

It can be seen from the above table that the reliability coefficient value is 0.960, which is greater than 0.9, indicating that the reliability of the research data is of high quality. Regarding the Cronbach's alpha if Item Deleted, after any item is deleted, the reliability coefficient will not increase significantly, so the item should not be deleted. Regarding the "CITC value", the CITC values of the analysis items are all greater than 0.4, indicating a good correlation between the analysis items and a good level of reliability. To sum up, the reliability coefficient value of the research data is higher than 0.9, which can be used for further analysis.

2. Analysis of validity

Validity research is used to analyze whether a measurment item is reasonable and meaningful, and validity analysis is conducted using factor analysis, a method of data analysis, to verify the level of validity of the data through a comprehensive analysis of KMO values, communalities, percentage of variance values, and factor loading coefficient values, respectively. The KMO value is used to determine the validity, the communalities value is used to exclude unreasonable research items, the percentage of variance value is used to indicate the level of information extraction, and the factor loading coefficient is used to measure the correspondence between factors (dimensions) and items. KMO and Bartlett's

Test were used to verify the validity of consumer purchase and use intentions. The analysis results are as follows in Table 4.3.

Table 4.3 Validity analysis results of consumer purchase and use intention survey questions

Name	Factor loading coefficient	Communality (common factor variance)
D11	0.950	0.903
D12	0.938	0.880
D13	0.913	0.834
Eigen value (Unrotated)	2.616	-
% of Variance (Unrotated)	87.205%	-
Cumulative % of Variance (Unrotated)	87.205%	-
Eigen value (Rotated)	2.616	-
% of Variance (Rotated)	87.205%	-
Cumulative % of Variance (Rotated)	87.205%	-
KMO value	0.748	-
Bartlett's Test of Sphericity	192.124	-
df	3	-
p value	0.000	-

According to the results of the above variable reliability, validity and factor analysis, the factor loading coefficient, weight, average value, KMO value, P value, percentage of variance and Cronbach's alpha coefficient of all survey items can be obtained. According to the comprehensive analysis of these coefficients and data, it can be found that all of them passed the Bartlett's test of sphericity ($p<0.05$), and the validity of the study data was good, which satisfied the prerequisite requirements of factor analysis. At the same time, the calculation of the question weights provided a method for calculating the specific data of the nine variables more accurately, and these preparations provided the data basis for the subsequent structured path analysis.

Objective 2 of the study: Difference analysis of demographic variables on survey items
Difference analysis of gender on survey items
To explore whether gender makes a difference in each survey item, gender was used as a grouping variable, and nine survey items, perceived ease of use (C1), perceived usefulness (C2), device hardware and software design (A1), education, training and promotion (A2), background support and service (A3), consumer, subjective norms (B1), consumer innovative characteristics (B2), consumer perceived risk (B3), and purchase intention (D) etc. as test variables for t-test, and their results are shown in Table 5.

In table 4.43:
(1) The evaluation score of males and females in the survey item of perceived ease of use is 5.717 and 5.535, indicating that males are slightly better than females in terms of the ease of use of smart wearable devices, but on the whole, it does not reach a significant level.
(2) The evaluation score of males and females in the survey item of perceived usefulness is 5.792 and 6.211. This shows that in terms of perceived usefulness, the overall average value of women is significantly higher than that of men, indicating that in terms of the usefulness of smart wearable devices, women are significantly stronger than men, with a P value of 0.033 reaching a significant level, indicating that in terms of perceived usefulness, women are significantly higher than men, and reach a significant level.
(3) The evaluation score of males and females in the survey item of the device software and hardware design is 6.176 and 5.932. This shows that the overall average value of women is

slightly lower than that of men in terms of device software and hardware design, and that men are slightly stronger than women in terms of software and hardware design of smart wearable devices, but overall, does not not reached a significant level.

Table 4.4 Difference analysis of gender on survey items

Level Classification		Gender		T-value	P-value
		Male (N=159)	Female (N=167)		
Perceived ease of use (C1)		5.717	5.535	0.426	0.352
Perceived usefulness (C2)		5.792	6.211	0.986	0.033*
Product Level	Device software and hardware design (A1)	6.176	5.932	0.327	0.269
	Education, Training and Promotion (A2)	5.821	6.121	0.905	0.008*
	Background support and services (A3)	5.687	5.817	1.413	0.111
Consumer Level	Consumer subjective norms (B1)	5.014	5.518	0.822	0.000**
	Consumer Innovation Characteristics (B2)	5.904	5.517	0.322	0.000*
	Consumer perceived risk (B3)	5.039	5.217	1.226	0.115
Intention to buy (D)		4.924	5.115	1.903	0.102

* means p value is less than 0.05; ** means p value is less than 0.01

The research results show that (1) perceived ease of use, perceived usefulness, backend support and services, perceived risk, innovation traits and intention to use reflected significant differences in academic qualifications. (2) The difference analysis results of educational background on each survey items show that in terms of background support and services, consumer innovation characteristics and purchase intention, the survey evaluation scores of undergraduate and specialist degrees or above are significantly higher than those with educational background in high school or below. (3) The difference analysis results of the monthly income level on each survey items show that there are significant differences in the monthly income level on consumers' perceived usefulness, education, training and promotion, innovation characteristics and use intention. Among them, consumers with incomes of 10,000 to 15,000 and 15,000 or more have significantly higher perceived usefulness of smart wearable products, while consumers with monthly incomes of 6,000 or less have significantly lower perceived usefulness evaluation. This indicates that smart wearable products are technology-based products, and consumers generally have a higher level of income to purchase such products above a certain level. This provides a reference for the marketing design of intelligent wearable products in the later period. (4) The difference analysis results of age on each survey item show that there are significant differences in consumer perceived ease of use, perceived usefulness, device hardware and software design, education, training and promotion, background support and services, subjective norms,

perceived risk, innovative characteristics and intention to use all in terms of age. Among them, consumers 25 and below have a significantly higher perceived of ease of use of smart wearable products, followed by consumers 26-40 years old, and consumers over 56 years old have a significantly lower perceived of ease of use. In terms of perceived usefulness, consumers under 25 and consumers over 56 years old have higher evaluation scores, which is relatively consistent with the evaluation scores of consumers' shopping willingness. In terms of purchase intention, consumers under 25 years old have significantly higher purchase intention than other age levels, followed by the overall performance of consumers over 55 years old, and are also the main consumers of smart wearable products. In terms of education, training and promotion, consumers over 56 years old perform significantly higher than other age groups. In terms of consumer innovation characteristics, consumers in low-age groups are generally higher than consumers in high-age groups, which provides direction and data support for the planning of later industries.

Conclusion

1. The results of the empirical analysis of the explanatory degree of the variables by each question item of the factors influencing the purchase intention of smart wearable devices show that (1) The KMO value of the survey results of mediating variables perceived usefulness is 0.774, and the validity of the research data is good; the percentage of variance is 78.42%, and the percentage of variance is high, and the Cronbach's alpha coefficient is 0.847. (2) The KMO value of the survey results of mediating variables perceived usefulness is 0.687, and the validity of the research data is good; the percentage of variance is 77.86%, and the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.830. (3) The KMO value of the survey results of the independent variable software and hardware design of device is 0.667, and the validity of the research data is good; the percentage of variance is 73.41%, the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.798. (4) The KMO value of the survey results of the independent variable education, training and promotion is 0.636, and the validity of the research data is good; the percentage of variance is 65.06%, the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.722. (5) The KMO value of the survey results of the independent variable background support and service is 0.634, and the validity of the research data is good; the percentage of variance is 70.436%, the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.789. (6) The KMO value of the survey results of the independent variable consumer subjective norms is 0714, and the validity of the research data is good; the percentage of variance is 74.780%, the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.831. (7) The KMO value of the survey results of the independent variable consumer innovation characteristics is 0.709, and the validity of the research data is good; the percentage of variance is 74.111%, the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.814. (8) The KMO value of the survey results of the independent variable consumer perceived risk is 0.675, and the validity of the research data is good; the percentage of variance is 66.625%, the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.747. (9) The KMO value of the survey results of the independent variable consumer perceived risk is 0748, and the validity of the research data is good; the percentage of variance is 87.20%, the percentage of variance is higher, and the Cronbach's alpha coefficient is 0.907. From the results of the above analysis, it can be seen that the survey results have a high degree of credibility and the overall effect of the data is good, which is consistent with the moderation of factor analysis to further explore its internal relationships.

According to relevant theories and literature analysis, screen out various influencing variables that affect consumers' purchase of smart wearable devices, construct an analysis scale of various variables, and explore the explanatory ability of various factors of smart

wearable device purchase intention to the original variables through investigation and analysis. The analysis results show that the explanatory degree of survey questions to each variable is generally more than 65%, and the survey scale constructed in this paper has a high explanatory degree to each influencing variable of consumers' purchase intention.

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Cite this article:

Chen Wei (2021). The influence of Consumers' Purchase intention on Smart Wearable Device: A study of Consumers in East China. *International Journal of Science and Business, 5*(8), 46-72. doi: https://doi.org/10.5281/zenodo.4765601

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