

Article

Expanding the Psychological Domain of Technological Acceptance: The Use of Smart Wearable Devices in Leisure

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Abstract: This study introduces a new integrated framework by incorporating the Unified Theory of Acceptance and Use of Technology as the technological acceptance component, combined with satisfaction and perceived risk as the psychological acceptance components. The aim is to explore consumers' behavioral intentions toward smart wearable devices and their expectations for the industry. The findings reveal that all research hypotheses were met as anticipated. Notably, the relatively low influence of Facilitating Conditions within the technological acceptance part and the prominent Perceived Functional Value within the psychological acceptance part highlight consumers' concerns about the compatibility of smart wearable device ecosystems and their satisfaction with basic functionalities. This conclusion indicates that the market needs to address and improve the challenges posed by multi-brand product ecosystems and that addressing the lack of innovation reduces the emotional connection between products and consumers.

Keywords: UTAUT; smart wearable devices; leisure; psychological; behavioral intentions



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1. Introduction

Amidst the backdrop of the post-pandemic period, a need has emerged to engage in a nuanced exploration of the far-reaching and transformative consequences wrought by the COVID-19 pandemic on the leisure industry. The pandemic has wreaked staggering financial havoc upwards of USD 4 trillion on the tourism sector [1], rendering it one of the most cataclysmic recessions since the Second World War [2]. Evident in the substantial decrease in global leisure tourism [3] lies the need to scrutinize the intricate dynamics of altered consumer behavior and implications on leisure pursuits. Underpinned by the empirical insights articulated by UNWTO [4], international tourism has witnessed a stark reduction of 65%, bearing a poignant testament to the pandemic's seismic influence. Navigating the complex post-pandemic landscape, consumers' prudence toward health and safety has become of paramount importance [5]. As a result, consumer demand and behavior are also changing, with an increasing number of people opting for nearby tools and using digital technology facilities for leisure activities [6]. This trend is driving the digital transformation of the leisure industry, which also means that the use of smart devices will become even more closely intertwined with consumers' lives.

Amidst this tumultuous backdrop, smart wearable devices (SWDs) have surged in popularity [6]. Lupton posits that this trend is at the forefront of the digital transformation currently enveloping the leisure industry [7], catalyzing an inextricable bond between SWDs and consumer lifestyles. Furthermore, the upheaval caused by the pandemic could be envisaged as a double-edged sword, wherein the adversities have created windows for accelerated digital transformation and the fostering of sustainable development within the leisure industry. Despite the significant losses incurred across various domains of human endeavor worldwide, the current situation has also afforded us an opportunity

to reconsider and accelerate the digital transformation of the tourism and leisure sector, thereby facilitating sustainable development within the industry [8].

The significance of this transformation is evident in empirical data obtained in 2020 [9]. This report highlights the global economic consequences of the COVID-19 pandemic and emphasizes the central role that East Asia, with China at its core, plays in the global electronics industry chain. The report systematically delineates the profound interlinkages that major global economies share with China's electronics-related products, substantiating these dynamics through a visual representation. A YoY growth of 35.1% in the global SWD market in the third quarter of 2020 was observed, while the Chinese market witnessed an astounding 76.8% rise in adult smartwatch shipments within the same timeframe [10]. Moreover, a data analysis conducted by the National Bureau of Statistics indicated significant disparities in the annual growth rates of the sub-industries within the manufacturing sector of smart wearable cultural devices from 2019 to 2023, with growth rates of over 30%, over 20%, 46.4%, and 10.2%, respectively [11–14]. From the outbreak of the pandemic in 2019 to the post-pandemic era, the production and manufacturing of SWDs also underwent substantial fluctuations and volatility. In light of this contextual backdrop, a judicious examination of consumer behavior, particularly pertaining to their propensities toward adopting SWDs for leisurely pursuits, has become an important research direction. Such an endeavor necessitates a robust and rigorously grounded theoretical framework.

However, previous research has typically concentrated on specific aspects of smart wearable devices. Studies often hone in on specific applications, such as fitness [15–17], healthcare [16–19], and education [20]. Alternatively, research might focus on individual products within the smart wearable spectrum, including smart watches [15], smart glasses [20], and smart clothing [17]. Another common focus is the development and investigation of systems and components, encompassing both hardware and software, related to smart wearable devices [16–18,21]. Additionally, despite China's significant population, there remains a notable gap in research specifically targeting the Chinese market. While the aforementioned research on SWDs provides targeted insights across various fields, it falls short of addressing the overall SWD market. Specifically, it does not adequately reflect consumers' intentions to continue purchasing and using these devices, and it does not fully capture their preferences regarding design and functionality. Therefore, this study focuses on consumers' behavioral intentions regarding the use of smart wearable devices in leisure environments. By taking a comprehensive approach, this research aims to explore how these devices can be integrated into daily leisure activities, ultimately providing market-driven insights for future improvements. This study also aims to explore the role of SWDs in enhancing leisure experiences and consumer satisfaction. Previous research has shown that techno-leisure, such as SWDs, can improve leisure activity experiences by promoting physical and mental well-being while also providing relaxation, socialization opportunities, self-identity development, and lifestyle enhancement [22]. Virtual communities built around these devices offer further opportunities for socialization, self-identity development, and lifestyle enhancement [23].

2. Literature Review and Hypothetical Relationships in the Research Model

2.1. The Definition of Leisure

In the field of leisure studies, the classic definition of leisure time as “unproductive time consumption” is often cited [24]. Leisure time refers to time spent away from basic activities such as work, household chores, and education [25], and it is typically associated with activities that provide pleasure and satisfaction [26]. The definition of leisure has evolved over time due to technological advancements and changes in societal norms. In recent decades, researchers have recognized that leisure is an experiential concept and have focused on studying people's “perception” of their leisure experiences [27].

According to the purposes of leisure demands, leisure activities can be broadly categorized into six types: Firstly, there is social leisure, which involves providing help to others for satisfaction or engaging in social interactions with others directly. Secondly,

there is knowledge-based leisure, which aims to expand knowledge, broaden horizons, and enhance cultural cultivation. Thirdly, there is physical fitness leisure, which focuses on improving one's physical health and fitness. Fourthly, there is aesthetic leisure, which serves the purpose of mood transformation and aesthetic appreciation. Fifthly, there is self-amusement leisure, which involves engaging in activities purely for one's own enjoyment and amusement. Lastly, there is time-killing leisure, which is characterized by engaging in activities to pass the time when one has nothing else to do. The authors define leisure as an individual's internal perception of whether an activity is pleasant or satisfying without limiting it to a specific time or space.

2.2. Classification of SWDs

Smart wearable devices encompass an array of electronic apparatuses housing microcontrollers strategically situated in proximity to or upon the dermal surface. These devices are adept at discerning, analyzing, and transmitting data concerning bodily cues, encompassing vital signs and environmental inputs, consequently providing instantaneous feedback to the wearer. Facilitated by the gradual proliferation of artificial intelligence, virtual (augmented and mixed) reality, and allied technologies, wearable devices have transcended their initial singular functionality, evolving into multifaceted entities simultaneously underscored by heightened portability and practicality. From a functional standpoint, these products indispensably encompass functions intrinsic to human-machine interfaces, interconnectivity, and sensorial perception. Notably, they are undergoing a transformative evolution characterized by increased integration, diminutive form factors, and enhanced utility, concomitantly amassing a spectrum of physiological data encompassing visual, tactile, and auditory modalities. These comprehensive attributes render SWDs versatile tools tailored to cater to diverse domains, including leisure, sports, and medical requisites [28–32].

SWDs are supported by the wrist, the head, the feet, and non-mainstream products. Common types of SWDs include smartwatches/bands, headsets, glasses, clothes, sports shoes, wearable speakers, etc. Smartwatches are representative products worn on the wrist, containing extended communication functions of mobile operating systems. Today's smartwatches track activities by capturing hand gestures and GPS while displaying specific information such as payments or fitness tracking. Smart head-mounted devices use optical displays for virtual reality experiences, while HUD/VR/AR/MR/smart contact lenses offer new products mainly used for entertainment purposes, such as watching movies or playing games. Smart clothing and shoes adjust the temperature according to external environment conditions while tracking physical fitness/location, among other features [33,34]. The development of these SWDs not only makes life convenient but also enriches people's leisure style, creating huge market potential requiring study into consumers' behavioral intentions.

2.3. Techno-Psychological Acceptance Theoretical Model

The theoretical model of this study is an innovative, integrated framework comprising two components: technology acceptance and psychological acceptance. The aim is to explore consumer behavior intentions. The technology acceptance part is primarily based on the Unified Theory of Acceptance and Use of Technology (UTAUT), which includes the constructs of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FCs), and behavioral intention (BI). It has emerged as a pertinent and efficacious analytical framework [35,36]. Originally devised to assess the extent of technology adoption, the UTAUT framework stands preeminent in explicating users' behavioral intentions within this domain, consequently assuming the mantle of seminal reference theory. The UTAUT primarily focuses on organizational contexts, whereas the UTAUT2 extends the model to include consumer use contexts and introduces three additional constructs to better capture consumer behavior, namely, Hedonic Motivation, Price Value, and Habit [36], underpinned by a focus on consumer technology acceptance. By incorporating the new constructs and extending the application context, the UTAUT2 enhances

the explanatory power of the model, providing a more comprehensive understanding of the factors influencing technology acceptance and use, thus making it more applicable to a broader range of technology adoption scenarios. This accommodation is made to harmonize the research's actual exigencies, objectives, environmental considerations, and overarching scholarly backdrop.

In addition, the psychological acceptance part is dominantly underpinned by the dual constructs of affirmative psychological contentment and adversative psychological perceived risk. The significance of the influence of satisfaction on consumers' behavioral intentions is of paramount importance, but the UTAUT framework, due to its inherent structure, does not overtly encapsulate the satisfaction quotient germane to the gamut of technological acceptance, thus delineating a limitation that has precluded its broader adoption within scholarly discourse [37]. Satisfaction is an elemental construct [38] characterized by a multidimensional framework [39], manifesting through an array of formative indicators that delineate disparate facets [40]. Therefore, the influence of satisfaction on technology acceptance remains intricate and multifarious. In accordance with Mackenzie's study suggestions, satisfaction, as a core concept, should be measured by combining multiple dimensions in a complementary manner [40]. Therefore, this study references the necessity in the UTAUT2 of measuring consumers' Hedonic Motivation (the enjoyment or pleasure derived from using technology), Price Value (the perceived cost–benefit trade-off), and Habit (the extent to which behaviors are performed automatically due to learning) for the psychological perception of technology. Satisfaction is measured from three perceived dimensions, namely, Perceived Emotional Value (PEV), Perceived Price Value (PPV), and Perceived Functional Value (PFV), collectively termed perceived value. The sub-dimensions exert an impact on the central construct of satisfaction in independent, complementary, and non-interfering manners [41]. Therefore, they are grouped in perceived value as sufficient and necessary factors collectively serving as the analytical conduits through which satisfaction is measured and evaluated. Perceived risk has been empirically substantiated across diverse domains as a pivotal determinant, exerting adverse effects on behavioral intentions and satisfaction, among other crucial dimensions [42]. In addition, perceived risk also serves to achieve reverse measurement and validation. Furthermore, it has been incorporated as an exogenous validating factor within the framework of the UTAUT [43].

It is also worth mentioning the mediation and cross-comparison in the UTAUT. Abbad suggests that, when studying everyday consumers' technology adoption, it is not always necessary to include these aspects and that selective inclusion should be applied, as ordinary consumers often choose technology based on their personal preferences [44]. In summary, this study established a prototype of a theoretical model integrating technology and psychology acceptance. It measured subjects' expectations for the future of the SWD industry at both technical and psychological levels.

2.4. Technology Acceptance—UTAUT

This study utilized the UTAUT proposed by Venkatesh [35] to examine consumers' behavioral intentions to use SWDs during leisure activities. The UTAUT is recognized as one of the most mature models in the field of technology acceptance research [45] and is considered the most comprehensive interpretation model of technology acceptance [46–48]; it also represents the most advanced comprehensive view [30,35]. It is built on eight models, namely, Task–Technology Fit (TTF), Innovation Diffusion Theory (IDT), Theory of Rational Action (TRA), Theory of Planned Behavior (TPB), Motivation Model (MM), Model of PC Use (MPCU), Social Cognitive Theory (SCT), and PC based on combined TAM and TPB (C-TAM-TPB) [35]. The model contains four independent variables: Performance Expectancy is defined as the degree to which an individual believes that using the system will help them attain gains in job performance. Effort Expectancy is defined as the degree of ease associated with the use of the system. Social Influence is defined as the degree to which an individual perceives the importance that others ascribe to using the new system.

Facilitating Conditions is defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system.

The UTAUT has been widely used by researchers to explain consumers' behavioral intentions [35,36]. However, it has some limitations. To address this issue, Venkatesh suggests that researchers introduce new variables in various contexts and cultures [49]. Additionally, some studies have shown that good results can be obtained by deleting the moderator variable [50]. In this study, we cite the UTAUT in the leisure field and eliminate the influence of the moderator based on our research sample's characteristics. Our aim is to test the usefulness of an expanded UTAUT for predicting consumer behavioral intentions to use SWDs for leisure activities. We verify whether this enhanced model can maintain a high level of explanatory power. Therefore, we make the following assumptions:

Hypothesis 1: *Performance Expectancy has a significant impact on behavioral intentions to use SWDs in leisure.*

Hypothesis 2: *Effort Expectancy has a significant impact on behavioral intentions to use SWDs in leisure.*

Hypothesis 3: *Social Influence has a significant impact on behavioral intentions to use SWDs in leisure.*

Hypothesis 4: *Facilitating Conditions have a significant impact on behavioral intentions to use SWDs in leisure.*

2.5. Psychological Acceptance—Satisfaction

Since the 1970s, the concept of consumer satisfaction has garnered significant attention within both marketing practices and scholarly circles [51,52]. Undeniably, satisfaction assumes a pivotal role in predicting post-purchase consumer behavior [53,54]. In models such as ACSI, ECSI, and CCSI, a robust correlation is evident between customer satisfaction and loyalty, a linkage bearing profound ramifications for consumer purchasing behavior [55]. This connection between satisfaction and behavioral intentions, pervasive in interdisciplinary research, is emphasized within the precincts of this study [56]. Notably, within the fields of leisure and information technology, this relationship has garnered substantial scholarly attention. Recognized across the board is the critical role of satisfaction in shaping behavioral intentions in the milieu of leisure activities such as travel and tourism [57]. Hutchinson emphasized the connection between satisfaction levels within leisure travel and ensuing behavioral intentions [58]. Additionally, the extant scholarly literature provides robust endorsement for the exploration of perceived user satisfaction vis-à-vis behavioral intentions [59]. Building upon this, Delone and Mclean introduced the information systems success model, which underscores the intertwined nature of satisfaction and usage behavior [60].

In the domain of information technology research, an important research direction is a focus on context-specific factors, transcending mere replication models [61]. The UTAUT2 introduces the concept of Hedonic Motivation, encapsulating the pleasure and enjoyment derived from technology usage [36]. This experiential gratification bears a direct influence on consumers' perceived satisfaction, a phenomenon imbued with the capacity to engender heightened behavioral intentions. Aligned with the classical UTAUT framework, the following assumption is made:

Hypothesis 5: *Satisfaction has a significant impact on consumers' behavioral intentions to use SWDs in leisure.*

According to Zeithaml's study, perceived value epitomizes the holistic evaluation undertaken by consumers concerning a product or service, grounded in the interplay of

received benefits and relinquished efforts [62]. The seminal work of Sweeney and Soutar underscores the primacy of multiple dimensions in perceived value, encompassing functional, price, emotional, and social facets [63]. Extending this discourse, Sheth propounds that perceived value encompasses an array of dimensions, including social, emotional, functional, cognitive, and situational attributes [64]. Noteworthy is the encapsulation of functional value that spans both price and performance/quality aspects. Within the contours of this study, particular emphasis is placed on the exploration of the Perceived Functional Value (PFV), Perceived Emotional Value (PEV), and Perceived Price Value (PPV) dimensions, mirroring the tenets of the UTAUT, which inherently embraces the salience of SI. Post-purchase, multidimensional perceived value engenders evaluative dynamics that reverberate through post-experience satisfaction [63]. Demiurges' empirical endeavors further confirm the affirmative impact of distinct perceived value dimensions on customer satisfaction [65]. The discernible significance of perceived values in retail arenas is poignantly highlighted through these scholarly inquiries. Consequently, hypotheses are proposed, stating that the functional, emotional, and price dimensions epitomize quintessential factors that decisively shape consumer satisfaction.

Hypothesis 8a: *Perceived Functional Value has a significant impact on the satisfaction of using SWDs in leisure.*

Hypothesis 8b: *Perceived Emotional Value has a significant impact on the satisfaction of using SWDs in leisure.*

Hypothesis 8c: *Perceived Price Value has a significant impact on the satisfaction of using SWDs in leisure.*

2.6. Psychological Acceptance—Perceived Risk

Bauer (1967) introduced the seminal construct of perceived risk, connoting consumers' subjective perception of the degree of uncertainty and severity linked to their decision-making processes [66]. Perceived risk, being inherently goal-oriented, is malleable and capable of undergoing modifications during the trajectory of decision-making [67]. Building upon this foundation, Bettman delineated a dichotomy between inherent risk and handled risk, with the former pertaining to latent product-associated vulnerabilities and the latter alluding to the risks that consumers consciously perceive when contemplating a purchase [68]. This encompasses the disruption of psychological anticipations concerning product performance and post-purchase evaluations, typically entailing the dimensions of time, function, physical attributes, financial implications, social dynamics, and psychological resonances [69,70]. Within the sphere of leisure pursuits, an array of risks emanates from the surrounding environment. The advancement of technology has demonstrated the potential to ameliorate certain risk factors, particularly those such as network security, which tend to preoccupy consumers in the context of utilizing SWDs. Nevertheless, the apprehensions regarding information leakage, system errors, the potential compromise of personal physiological information, system incompatibility, and inadequate software provisions persistently loom, eluding complete eradication.

Iskandar underscored the inverse correlation between the propensity to embrace new technology and the perceived risk associated with its adoption [65]. The salience of perceived risk also extends to influencing the emotive dimension of consumer satisfaction both pre- and post-purchase [71]. In a similar vein, some studies have independently underscored the substantial negative impact of perceived risk on technology acceptance models and overall satisfaction [72,73]. The present study aims to delve into the nuanced facets of perceived risk and satisfaction engendered by the utilization of SWDs during leisure pursuits. Moreover, it endeavors to elucidate the intricate interplay between these constructs and their collective influence on behavioral intentions. Accordingly, the following overarching hypotheses are devised for exploration and validation:

Hypothesis 6: *Perceived risk has a negative significant impact on the satisfaction of using SWDs in leisure.*

Hypothesis 7: *Perceived risk has a negative significant impact on behavioral intentions to use SWDs in leisure.*

A schematic representation of the research model (the technical dimension is shown in blue; the psychological dimension is shown in yellow) is presented in Figure 1 below:

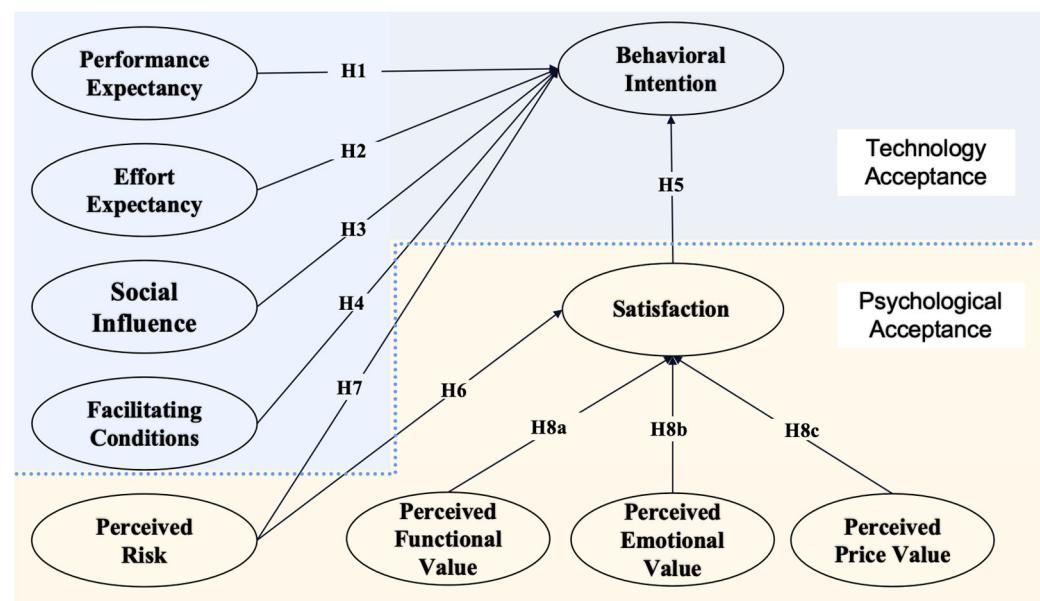


Figure 1. Techno-psychological acceptance theoretical model.

3. Methodology

In 2022, China evaluated cities based on 5 dimensions and 20 indicators to determine their level of high-quality development. The top four cities identified were Shenzhen, Shanghai, Guangzhou, and Beijing. This study focused on these cities to investigate consumer behavioral intentions when using SWDs during leisure activities. A questionnaire was first presented in Korean, and after the authors conducted in-depth research, one of them translated it into Chinese and performed reverse translations and revisions a number of times to ensure that the original meaning of the questionnaire was not changed. In the end, the authors used the same method to translate and revise the original Korean questionnaire into English (Table 1). The questionnaires were collected online by qualified online research companies, and an offline collection was directly carried out by the researchers. Furthermore, data collection was completed twice in order to more fully capture the sample parameters of different users and increase the representativeness of the questionnaire, resulting in a total of 657 questionnaires. The items in the questionnaire were all measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 1. Measurement variables.

Variables	Sources
Performance Expectancy (PE)	
PE1	Using SWDs is very useful during leisure time.
PE2	Using SWDs during leisure time can improve the quality of leisure activities.
PE3	Using SWDs can effectively manage leisure time.
PE4	Using SWDs during leisure to quickly collect information about leisure activities.

[36,74,75]

Table 1. Cont.

Variables		Sources
Effort Expectancy (EE)		
EE1	SWDs are very convenient for me to use at leisure.	[36,74,75]
EE2	Using SWDs is fast and easy for me.	
EE3	It is not difficult for me to learn to operate SWDs.	
EE4	Using SWDs is easy for me.	
Social Influence (SI)		
SI1	People who are important to me think that it is good for me to use SWDs.	[36,74,75]
SI2	People who have an influence on me think that it is good for me to use SWDs.	
SI3	People who affect my leisure activities think that I need to use SWDs.	
SI4	People who are valuable to me want me to use SWDs.	
Facilitating Conditions (FC)		
FC1	I have enough resources to use SWDs.	[36,74,75]
FC2	I have enough knowledge to use SWDs.	
FC3	I have enough skills to use SWDs.	
FC4	When I encounter difficulties using SWD, I can get help from others.	
Behavioral Intention (BI)		
BI1	I plan to use SWDs at leisure in the future.	[36,74,75]
BI2	I plan to use SWDs as soon as I have the opportunity in my leisure time.	
BI3	I plan to increase the use of SWDs during my leisure time.	
BI4	I plan to recommend others to use SWDs during leisure in the future.	
Perceived Risk (PR)		
PR1	SWDs cannot ensure the safety of my personal information.	[76,77]
PR2	The function of a smart wearable device does not meet my requirements.	
PR3	It is inconvenient to wear SWDs.	
PR4	The leisure activity data obtained from SWDs is not accurate.	
Satisfaction (SA)		
SA1	Using SWDs during leisure time has met my expectations.	[78,79]
SA2	I am satisfied with using SWDs during leisure time.	
SA3	Using SWDs during leisure time is more satisfying to me than general smart devices.	
Perceived Function Value (PFV)		
PFV1	I think the cost of SWDs is economical.	[78,79]
PFV2	I think SWDs are more portable than general smart devices (mobile phones, etc.).	
PFV3	I think SWDs have better functions than other smart devices.	
PFV4	Compared with the price, SWDs provide me with many benefits.	
Perceived Emotion Value (PEV)		
PEV1	It is happy to use SWDs in leisure.	[78,79]
PEV2	It is fun to use SWDs in leisure.	
PEV3	It is very exciting to use SWDs in leisure.	
Perceived Price Value (PPV)		
PPV1	The price of SWDs is reasonable.	[36,80]
PPV2	SWDs are good value for money.	
PPV3	Judging from the current market price, SWDs are very cost-effective.	

Owing to the robust computational capabilities intrinsic to R's open-source programming framework, the present investigation harnesses the R-package "lavaan" (latent variable analysis) [81] for the purpose of conducting an in-depth exploratory examination of the dataset. Subsequently, an approach structural equation modeling (SEM) analysis [81] is undertaken. In adherence to the methodological guidelines delineated by Gerbing and Anderson [82], exploratory and confirmatory factor analyses are executed, thereby assuring both the internal coherence of the proposed model and the veracity and dependability of its underlying construct. Notably, the measurement model is subjected to meticulous scrutiny across all variables. Ultimately, the conceptual framework posited by this research, along with its hypotheses, undergoes rigorous validation through the lens of SEM.

4. Results

4.1. Descriptive Statistics

Table 2 presents a comprehensive elucidation of the demographic attributes of all participants who completed the disseminated questionnaires. Upon a thorough examination of the meticulously arranged dataset, notable trends were observed, indicating that the proportion of male respondents (56.2%) was slightly higher than that of female participants (43.8%). Predominantly, the respondents were geographically clustered in Guangzhou (34.4%), followed by Shanghai (27.1%), Beijing (24.2%), and Shenzhen (14.3%). A significant proportion of the participants possessed a university-level education (43.7%), whereas 39.6% held a college degree, and a minority (3.3%) held a postgraduate degree. The demographic cohort with the highest representation was the 30–39 age group (31.2%), followed by the 20–29 age group (24.8%) and the 40–49 age group (22.4%). From an economic standpoint, most of the respondents received a monthly remuneration (CNY) within the 5000–8000 range (26.3%), followed by earnings falling below 5000 (24.8%) and a notable presence within the 12,001–15,000 earnings bracket (18.9%).

Table 2. Demographic characteristics of respondents.

Variable	Description	N (%)	Variable	Description	N (%)
Gender	Male	56.2	Age	Younger than 20	2.9
	Female	43.8		20–29	24.8
City	Beijing	24.2		30–39	31.2
	Shanghai	27.1		40–49	22.4
	Guangzhou	34.4		50–59	12.9
	Shenzhen	14.3		Over 60	5.8
Education	High school or less	13.4	Income (CNY)	Less than 5000	24.8
	College	39.6		5001–8000	26.3
	University	43.7		8001–12,000	20.9
	Postgraduate degree	3.3		12,001–15,000	18.9
				Over 15,0001	9.1

4.2. Measurement Model

Within the purview of this scholarly investigation, an incisive assessment of the scale's reliability and validity is of utmost importance. The findings, predicated upon three performance metrics, namely, Cronbach's α coefficient of internal consistency, Composite Reliability (CR), and Average Variance Extracted (AVE), as delineated in Table 3, unequivocally underscore the commendable levels of convergent validity and dependability exhibited by the articulated research model [83]. The calculated Cronbach's α coefficient values, ranging from 0.838 to 0.930, markedly surpass the established threshold of 0.7 [84]. It must be emphasized that an exercise of caution is warranted when interpreting results surpassing the 0.95 threshold, as such an occurrence may indicate serious collinearity issues between variables [85]. Additionally, the computed Composite Reliability (CR), spanning a range of 0.837 to 0.930, consistently exceeds the prescribed baseline of 0.7 [86], thereby

Table 3. Results of the measurement model.

Ave	PE	EE	SI	FC	BI	PR	SA	PFV	PEV	PPV	Items	Factor Loading
PE	0.707	0.349	0.361	0.337	0.469	−0.104	0.200	0.121	0.041	0.052	PE1	0.832
											PE2	0.850
											PE3	0.845
											PE4	0.841
EE	0.349 (0.122)	0.703	0.271	0.136	0.511	−0.113	0.211	0.065	0.064	0.031	EE1	0.871
											EE2	0.833
											EE3	0.857
											EE4	0.846
SI	0.361 (0.130)	0.271 (0.073)	0.725	0.252	0.356	0.049	0.135	0.148	0.021	0.024	SI1	0.839
											SI2	0.878
											SI3	0.871
											SI4	0.854
FC	0.337 (0.114)	0.136 (0.019)	0.252 (0.063)	0.619	0.283	−0.069	0.125	0.081	−0.004	0.016	FC1	0.799
											FC2	0.812
											FC3	0.859
											FC4	0.838
BI	0.468 (0.220)	0.511 (0.261)	0.356 (0.126)	0.283 (0.080)	0.565	−0.371	0.554	0.344	0.096	0.126	BI1	0.744
											BI2	0.692
											BI3	0.680
											BI4	0.791
PR	−0.104 (0.011)	−0.113 (0.013)	0.049 (0.002)	−0.069 (0.005)	−0.371 (0.137)	0.637	−0.540	−0.277	−0.125	−0.125	PR1	0.792
											PR2	0.845
											PR3	0.763
											PR4	0.882
SA	0.200 (0.040)	0.211 (0.045)	0.135 (0.018)	0.125 (0.016)	0.554 (0.306)	−0.540 (0.291)	0.681	0.491	0.263	0.290	SA1	0.776
											SA2	0.797
											SA3	0.754
PFV	0.121 (0.015)	0.065 (0.004)	0.148 (0.022)	0.081 (0.007)	0.344 (0.118)	−0.277 (0.076)	0.491 (0.241)	0.773	0.260	0.318	PFV1	0.836
											PFV2	0.843
											PFV3	0.899
											PFV4	0.898
PEV	0.041 (0.002)	0.064 (0.004)	0.021 (0.000)	−0.004 (0.000)	0.096 (0.009)	−0.125 (0.016)	0.263 (0.069)	0.260 (0.068)	0.715	0.197	PEV1	0.871
											PEV2	0.883
											PEV3	0.899
PPV	0.052 (0.003)	0.031 (0.001)	0.024 (0.001)	0.016 (0.002)	0.126 (0.016)	−0.125 (0.016)	0.290 (0.084)	0.318 (0.101)	0.197 (0.0039)	0.751	PPV1	0.903
											PPV2	0.858
											PPV3	0.908

Table 3. Cont.

AVE	PE	EE	SI	FC	BI	PR	SA	PFV	PEV	PPV	Items	Factor Loading
CR	0.906	0.906	0.912	0.867	0.837	0.874	0.865	0.930	0.883	0.900	Model fit $\chi^2/\text{df} = 930.482/584 = 1.593$ CFI = 0.978, NFI = 0.943, NNFI = 0.975, RMSEA = 0.030.	
α	0.905	0.903	0.910	0.865	0.838	0.871	0.864	0.930	0.881	0.897		

PE = Performance Expectancy, EE = Effort Expectancy, SI = Social Influence, FC = Facilitating Condition, BI = behavioral intention, PR = perceived risk, SA = satisfaction, PFV = Perceived Functional Value, PEV = Perceived Emotional Value, PPV = Perceived Price Value, CR = Composite Reliability, AVE = Average Variance Extracted (diagonally shaded numbers). The diagonal element is the AVE, the upper right is the standard error, the lower left is the correlation coefficient, and the square of the correlation coefficient value is in parentheses.

4.3. Structural Model

Based on the discerned outcomes presented in Table 3, the statistical analyses yield the following results: a Chi-square (χ^2) value of 930.482, characterized by a Degrees of Freedom (df) of 584, thereby yielding an χ^2/df ratio of 1.593. Furthermore, an evaluation of key fit indices reveals a Comparative Fit Index (CFI) of 0.978, a Normed Fit Index (NFI) of 0.943, a Non-Normed Fit Index (NNFI) of 0.975, and a Root Mean Square Error of Approximation (RMSEA) measuring 0.03. These outcomes collectively confirm that the established parameters integral to the structural equation model are notably satisfied, subsequently demonstrating the notable alignment of the proposed structural model with the empirical data.

To assess the hypothesized relationships, the articulated pathways between constructs are diligently scrutinized. The explanatory capacity of satisfaction registers at an appreciable 45.7%, while the power of behavioral intention substantiates itself with a robust explanatory power of 55.3%. Evidently, the outcome of the hypothesis testing attests to the following observations (see Table 4 and Figure 2): PE exerts a positively significant influence on behavioral intention ($\beta_{\text{PE} \rightarrow \text{BI}} = 0.207$, $t = 5.006$, $p < 0.001$). EE wields a favorable and statistically significant impact on behavioral intention ($\beta_{\text{EE} \rightarrow \text{BI}} = 0.314$, $t = 9.129$, $p < 0.001$). SI engenders a positive and statistically significant influence on behavioral intention ($\beta_{\text{SI} \rightarrow \text{BI}} = 0.146$, $t = 3.866$, $p < 0.001$). Facilitation Conditions elicit a constructive and statistically significant impact on behavioral intention ($\beta_{\text{FC} \rightarrow \text{BI}} = 0.087$, $t = 2.431$, $p < 0.05$). Satisfaction notably has a positive and statistically significant effect on behavioral intention ($\beta_{\text{SA} \rightarrow \text{BI}} = 0.371$, $t = 7.951$, $p < 0.001$). Perceived risk, while evoking a positive influence on behavioral intention and satisfaction, does so with a significantly negative magnitude ($\beta_{\text{PR} \rightarrow \text{BI}} = -0.125$, $t = -2.687$, $p < 0.01$; $\beta_{\text{PR} \rightarrow \text{SA}} = -0.431$, $t = -10.724$, $p < 0.001$). Perceived Functional Value materially and positively impacts satisfaction ($\beta_{\text{PFV} \rightarrow \text{SA}} = 0.318$, $t = 8.592$, $p < 0.001$). Similarly, Perceived Emotional Value significantly affects satisfaction ($\beta_{\text{PEV} \rightarrow \text{SA}} = 0.098$, $t = 2.705$, $p < 0.01$). Finally, Perceived Price Value has a constructive and statistically significant effect on satisfaction ($\beta_{\text{PPV} \rightarrow \text{SA}} = 0.118$, $t = 3.057$, $p < 0.01$). These empirical findings collectively underpin the rigorous validation of the articulated research model and the nuanced relationships encapsulated within it.

In summary, the outcomes gleaned from this study confirm the robust validation of the UTAUT within the scope of technological acceptance. While it remains evident that all factors exert a positive influence on behavioral intentions, the discernment of nuanced differentials also attests to the existence of certain pragmatic intricacies. Furthermore, the conclusions drawn from the three perceptual measurement dimensions of satisfaction concisely corroborate the underpinning hypotheses of this study. This confirmation substantiates the indispensability of altering extrinsic factors aligned with the psychological domain for the discernment of technology utilization within the context of leisure pursuits.

Table 4. Result of structural model.

Hypothesis	Path	Estimate	S.E.	C.R.	p-Value	Result
H1	PE→BI	0.207	0.041	5.006	***	supported
H2	EE→BI	0.314	0.034	9.129	***	supported
H3	SI→BI	0.146	0.038	3.866	***	supported
H4	FC→BI	0.087	0.036	2.430	*	supported
H5	SA→BI	0.371	0.047	7.951	***	supported
H6	PR→BI	−0.125	0.047	−2.687	**	supported
H7	PR→SA	−0.431	0.040	−10.724	***	supported
H8a	PFV→SA	0.315	0.037	8.592	**	supported
H8b	PEV→SA	0.098	0.036	2.705	**	supported
H8c	PPV→SA	0.118	0.039	3.057	***	supported

S.E. = standard error, C.R. = critical ratio, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

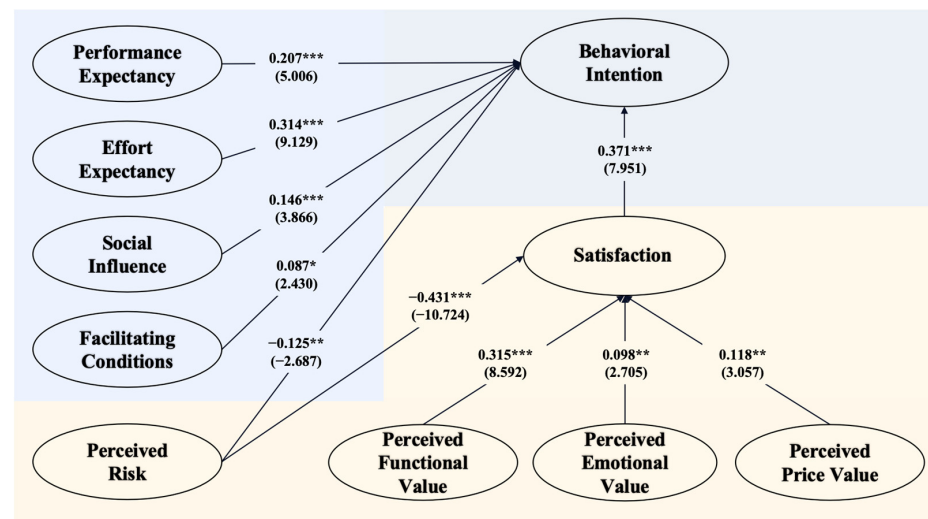


Figure 2. Result of the techno-psychological acceptance theoretical model. Note 1: *** $p < 0.001$. ** $p < 0.01$, * $p < 0.05$. Note 2: Values not in parentheses are standardized parameter estimate; values in parentheses are t values.

5. Discussion and Conclusions

The conclusion of this study engenders discourse within the spheres of technology and psychological acceptance. The variance elucidated stands at 55.3% for behavioral intentions and 45.7% for satisfaction, which substantially converges with the presented hypotheses. The ensemble of hypotheses pertaining to the factors undergirding the expanded model manifests statistically significant associations. The model's overarching architecture corroborates a pronounced propensity among consumers to assimilate SWDs into their leisure repertoire. While the research findings substantiate the anticipated conjectures to a large extent, nuanced distinctions persist, warranting contemplation. Initially, the outcomes pertaining to technology acceptance corroborate the supposition that consumers' behavioral intentions are substantially influenced by constructs such as Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. These constructs synergistically combine to have a direct impact on the configuration of behavioral intentions. The results show that the construct of Facilitating Conditions has a relatively muted significance. This diminution in prominence can feasibly be attributed to the intricate web of compatibility challenges that pervade the multifarious landscape of SWDs and their associated supplementary products. This compatibility conundrum is compounded by resource constraints and informational voids, which impede user-friendliness. Beyond this, the utilization of SWDs within recreational domains may necessitate a degree of adeptness in operating such equipment. The cultivation of skills and the navigation of challenges have emerged as integral components within high-quality leisure pursuits aiming to engender an immersive

leisure experience through goal attainment or skill refinement [89]. Hence, a stable and adept operational context is indispensable for the seamless execution of immersive leisure. This factor stands as one of the determinants affecting Facilitating Conditions. Equipment vendors predominantly cater to institutional and group clients, thereby accentuating their orientation toward providing enduring technical services. This predilection inadvertently gives rise to an apparent deficiency in the provisioning of technical support for individual consumers. The abundance of SWD types and brands, along with compatibility issues among different brands and systems, poses challenges to consumer behavior. A strategic approach should prioritize offering comprehensive technology support solutions, as well as pre-sales and after-sales services, including readily available quick-response solutions. Future developments should focus on ensuring the compatibility of multiple ecosystems for voice interaction, screen interaction, somatosensory functions, and sensory capabilities. Additionally, efforts should be made to enhance energy efficiency, prolong battery life, and reduce device size while introducing innovative products and features.

Regarding the psychological domain, the empirical findings validate the theoretical conjectures pertaining to the expanded factors and demonstrate their substantial impact on consumer behavior. The advent of the COVID-19 pandemic has caused a seismic shift toward online leisure activities, giving rise to heightened consumer awareness regarding cybersecurity dangers related to the divulgence of personal data for online platform registration. As devices proliferate and interconnect, amalgamating biometric data such as fingerprints and facial recognition, inadvertent compromises to personal and property security loom. Furthermore, the reliability of data feedback from SWDs introduces a spectrum of perceived risks for consumers. The findings of this study reveal an intriguing inverse correlation between perceived risk and both consumer satisfaction and behavioral intentions. In the quest to ameliorate these risks, designers and manufacturers must focus on fortifying cybersecurity measures and devising products that provide precise and reliable information. Evidenced in the observed dynamics, it is clear that perceived risk exerts a more pronounced negative influence on satisfaction than behavioral intention. This paradoxical phenomenon underscores that, while consumers express dissatisfaction with extant risk-related considerations, their purchasing decisions continue to persist, signifying prevailing confidence in the trajectory of technological evolution.

The outcomes of this study resonate with the initially posited hypotheses, and they corroborate a pronounced interplay among the three dimensions of perceived value and satisfaction. Notably, it is of significance to highlight that the PFV index of SWDs surpasses both the PEV and PPV indices. This discernment demonstrates that the extant functionalities of SWDs largely meet consumers' basic requirements. This attainment can be attributed to the assimilation of state-of-the-art technological advancements and efficacious marketing strategies. However, this achievement emanating from the satisfaction of basic functions does not necessarily engender heightened novelty or facilitate an extraordinary leisure experience. Additionally, such satisfaction does not elicit heightened emotional resonance. The subdued PEV may be ascribed to the constraints on leisure time and space, which hinder immersive experiences (VR/AR), while the formidable costs associated with manufacturing functionally adept devices also affect PPV and brand value. To increase consumer satisfaction, it is vital for software designers to concentrate on devising innovative features, whereas manufacturers should prioritize aesthetic enhancement, portability, and stringent quality control. Elevated satisfaction levels can catalyze high repurchase rates. Looking ahead, it is anticipated that affordable, high-caliber SWDs will satiate consumers' fundamental requirements, while additional features may necessitate supplementary expenses.

Based on previous research, this paper boldly adopts a novel framework integrating tech-psychological acceptance models. By leveraging a substantial amount of data, it transcends the limitations of prior technology acceptance theory research, innovating within the field of SWD (smart wearable devices) and leisure studies. The conclusions of this study align with theoretical expectations. The technology acceptance findings are

consistent with those of the UTAUT series, and the extended psychological acceptance model is also validated. Previous research has largely overlooked the importance of consumers' emotional satisfaction and risk perception in technology acceptance. This study addresses this gap by incorporating these factors, thereby highlighting the role of technology in market development and product improvement. Consumer emotional satisfaction fosters long-term habitual use and exploration of various types of SWD, driving attention and purchasing behavior. Unlike earlier studies that focused on specific types or functions of SWD [15–21], this research examines the prospects of the entire SWD industry.

The recent launch of Apple's Vision Pro [90], which has advanced the aerial projection capabilities of smart glasses, and the convenience of Ray-Ban's Smart Glasses MATE WAY-FARER [91] exemplifies the integration of SWD and AI. With technological advancements, the rapid development of artificial intelligence, and the advent of the Web 3.0 era, there are high expectations for the expansion of the SWD market. However, as Elon Musk's potential future ban on Apple products in his company following Apple's announcement of its collaboration with Open AI illustrates [92], consumer concerns about data and privacy security must not be ignored [71–73]. This paper's innovative approach is mirrored in Musk's actions, underscoring the practical significance of our theoretical hypotheses. The decision by Musk validates the importance of addressing consumer risk aversion in addition to enhancing technology, as it significantly impacts consumer satisfaction and behavioral intentions. Therefore, this study emphasizes the necessity of further research into enhancing the psychological acceptance of SWD, benefiting both the scientific community and industry stakeholders.

Therefore, future research should be dedicated to providing detailed insights into consumer behavior and preferences, as well as exploring the dynamic relationship between technological innovation and its application in the leisure field. It is crucial to continue studying SWD through the tech-psychological acceptance model to enhance psychological acceptance, benefiting both the scientific community and industry stakeholders. Additionally, recognizing the continuous evolution of consumer preferences driven by technological advancements, it is essential to adopt an agile research and development approach. Collaboration between industry stakeholders and academia can ensure that technological development aligns with empirical research findings. This approach will help in creating products that meet consumer expectations while fostering innovation in the SWD industry.

6. Limitations

As mentioned earlier, this study did not focus on individual products, specific applications, etc., but focused on the intention to use the smart wearable device. Therefore, it did not clearly distinguish between users with different experience levels and lengths of use, which may lead to different psychological effects on subjects' intuitive perceptions, thereby potentially biasing the results. If future research turns to a more microscopic and detailed direction, factors such as length of use and experience will be reconsidered. This study is circumscribed to four economically advanced Chinese cities, namely Beijing, Shanghai, Guangzhou, and Shenzhen, replete with educational demographics. Generalization beyond these cities requires circumspection due to unique cultural and economic attributes and the potential sampling biases induced by COVID-19-related travel restrictions. The investigation's interdisciplinary nexus encompasses sociology, psychology, behavior, and information systems and probes the impact of perceived factors on behavioral intentions toward technology in leisure [37]. The applicability of the UTAUT is examined within this specific scope. The inclusion of an array of perceived factors invites scrutiny regarding its effect on the model's efficacy. Van Raaij and Schepers (2008) hint at a decrease in the R^2 value with over-extension [93], while Jerry challenges the sole reliance on this metric [94]. Though this study meets expectations, corroboration is a requisite for establishing its comparability with the UTAUT's rigor. Future studies should aim to devise an integrated model, fostering a more encompassing examination of technology acceptance across diverse contexts.

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References

1. UNNEW. Coronavirus Hit to Travel Could Cost Global Economy \$4 Trillion. Available online: <https://news.un.org/zh/story/2021/06/1087132> (accessed on 30 June 2021).
2. Kaczmarek, T.; Perez, K.; Demir, E.; Zaremba, A. How to survive a pandemic: The corporate resiliency of travel and leisure companies to the COVID-19 outbreak. *Tour. Manag.* **2021**, *84*, 104281. [CrossRef] [PubMed]
3. Gössling, S.; Scott, D.; Hall, C.M. Pandemics, tourism and global change: A rapid assessment of COVID-19. *J. Sustain. Tour.* **2021**, *29*, 1–20. [CrossRef]
4. UNWTO. International Tourism and COVID-19. Available online: <https://www.unwto.org/tourism-data/international-tourism-and-covid-19> (accessed on 22 February 2023).
5. Shin, H.; Kang, J. Reducing perceived health risk to attract hotel customers in the COVID-19 pandemic era: Focused on technology innovation for social distancing and cleanliness. *Int. J. Hosp. Manag.* **2020**, *91*, 102664. [CrossRef] [PubMed]
6. Maryati, T. Consumer Behavior Changes Post Pandemic COVID-19. *Int. J. Halal Res.* **2020**, *2*, 84–89. [CrossRef]
7. Lupton, D. Foreword: Lively devices, lively data and lively leisure studies. *Leis. Stud.* **2016**, *35*, 709–711. [CrossRef]
8. Naden, C. Travel in a Pandemic: Can Tourism Recover? Available online: https://www.iso.org/files/live/sites/isoorg/files/news/News_archive/2021/08/Ref2694/ISO%20PAS%205643%20Travelling%20in%20a%20pandemic_cn.pdf (accessed on 22 August 2021).
9. KPMG. How COVID-19 Is Affecting the World Economy. Available online: <http://www.kpmg.com/cn> (accessed on 23 March 2020).
10. FORESEE. Panoramic Map of China's Wearable Device Industry in 2022. Available online: <https://www.qianzhan.com/analyst/detail/220/220602-5bd3cd62.html> (accessed on 5 June 2022).
11. Jia, X. National Bureau of Statistics Senior Statistician Jia Xin Interprets the 2019 Operating Income Data of Cultural and Related Industry Enterprises above Designated Size Nationwide. Available online: http://www.stats.gov.cn/xgk/jd/sjjd2020/202002/t20200217_1764905.html (accessed on 17 February 2020).
12. Jia, X. National Bureau of Statistics Senior Statistician Jia Xin Interprets the 2020 Operating Income Data of Cultural and Related Industry Enterprises above Designated Size Nationwide. Available online: http://www.stats.gov.cn/xgk/jd/sjjd2020/202101/t20210131_1812938.html (accessed on 31 January 2021).
13. Peng, Z. National Bureau of Statistics Senior Statistician Zhang Peng Interprets the 2021 Operating Income Data of Cultural and Related Industry Enterprises above Designated Size Nationwide. Available online: https://www.stats.gov.cn/xgk/jd/sjjd2020/202201/t20220130_1827177.html (accessed on 30 January 2022).
14. Peng, Z. National Bureau of Statistics Senior Statistician Zhang Peng Interprets the 2022 Operating Income Data of Cultural and Related Industry Enterprises above Designated Size Nationwide. Available online: https://www.stats.gov.cn/xgk/jd/sjjd2020/202301/t20230130_1892485.html (accessed on 30 January 2023).
15. Wang, F.; Sohail, A.; Tang, Q.; Li, Z. Impact of fractals emerging from the fitness activities on the retail of smart wearable devices. *Fractals* **2024**, *32*, 2240112. [CrossRef]
16. Cao, H. Application of Smart Wearable Fitness Equipment and Smart Health Management Based on the Improved Algorithm. *Comput. Intell. Neurosci.* **2022**, *2022*, 1654460. [CrossRef] [PubMed]
17. Ahsan, M.; Teay, S.H.; Sayem, A.S.M.; Albarbar, A. Smart clothing framework for health monitoring applications. *Signals* **2022**, *3*, 113–145. [CrossRef]
18. Idoga, E.P.; Adamu, A.I. Understanding Smart Wearable Sensors Technology: Impact on Human Health and Fitness. *J. Appl. Sci. Environ. Manag.* **2020**, *24*, 1261–1265. [CrossRef]
19. Hickey, B.A.; Chalmers, T.; Newton, P.; Lin, C.T.; Sibbritt, D.; McLachlan, C.S.; Clifton-Bligh, R.; Morley, J.; Lal, S. Smart devices and wearable technologies to detect and monitor mental health conditions and stress: A systematic review. *Sensors* **2021**, *21*, 3461. [CrossRef]
20. Al-Ansi, A.M.; Jaboob, M.; Garad, A.; Al-Ansi, A. Analyzing augmented reality (AR) and virtual reality (VR) recent development in education. *Soc. Sci. Humanit. Open* **2003**, *8*, 100532. [CrossRef]

21. Schiavi, B.; Havard, V.; Beddiar, K.; Baudry, D. BIM data flow architecture with AR/VR technologies: Use cases in architecture, engineering and construction. *Autom. Constr.* **2022**, *134*, 104054. [\[CrossRef\]](#)
22. Bryce, J. The Technological Transformation of Leisure. *Soc. Sci. Comput. Rev.* **2001**, *19*, 7–16. [\[CrossRef\]](#)
23. Jones, S. *Cybersociety 2.0: Revisiting Computer-Mediated Community and Technology*; SAGE Publications: Thousand Oaks, CA, USA, 1998.
24. Veblen, T. The Theory of the Leisure Class. *J. Polit. Econ.* **1899**, *8*, 106–117. [\[CrossRef\]](#)
25. Neulinger, J. *To Leisure: An Introduction*; Pearson Education Limited: London, UK, 1981.
26. Kabanoff, B. Occupational and Sex Differences in Leisure Needs and Leisure Satisfaction. *J. Organ. Behav.* **1982**, *3*, 233–245. [\[CrossRef\]](#)
27. Stebbins, R.A. Choice and Experiential Definitions of Leisure. *Leis. Sci.* **2005**, *27*, 349–352. [\[CrossRef\]](#)
28. Al-Emran, M. Evaluating the Use of Smartwatches for Learning Purposes through the Integration of the Technology Acceptance Model and Task Technology Fit. *Int. J. Hum.-Comput. Interact.* **2021**, *37*, 1874–1882. [\[CrossRef\]](#)
29. Düking, P.; Achtzehn, S.; Holmberg, H.C.; Sperlich, B. Integrated Framework of Load Monitoring by a Combination of Smartphone Applications, Wearables and Point-of-Care Testing Provides Feedback that Allows Individual Responsive Adjustments to Activities of Daily Living. *Sensors* **2018**, *18*, 1632. [\[CrossRef\]](#) [\[PubMed\]](#)
30. Gao, Y.; Li, H.; Luo, Y. An empirical study of wearable technology acceptance in healthcare. *Ind. Manag. Data Syst.* **2015**, *115*, 1704–1723. [\[CrossRef\]](#)
31. Mardonova, M.; Choi, Y. Review of Wearable Device Technology and Its Applications to the Mining Industry. *Energies* **2018**, *11*, 547. [\[CrossRef\]](#)
32. Düking, P.; Hotho, A.; Holmberg, H.C.; Fuss, F.K.; Sperlich, B. Comparison of Non-Invasive Individual Monitoring of the Training and Health of Athletes with Commercially Available Wearable Technologies. *Front. Physiol.* **2016**, *7*, 71. [\[CrossRef\]](#) [\[PubMed\]](#)
33. Hanuska, A.; Chandramohan, B.; Bellamy, L.; Burke, P.; Ramanathan, R.; Balakrishnan, V. *Smart Clothing Market Analysis*; Sutardja Center for Entrepreneurship: Berkeley, CA, USA, 2022.
34. Tavde, K.; Khambhati, V. Smart Shoes for Blind Person. *Compliance Eng. J.* **2021**, *12*, 68–71.
35. Venkatesh, V.; Morris, M.G.; Davis, G.B.; Davis, F.D. User Acceptance of Information Technology: Toward a Unified View. *MIS Q.* **2003**, *27*, 425–478. [\[CrossRef\]](#)
36. Venkatesh, V.; Thong, J.Y.; Xu, X. Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Q.* **2012**, *36*, 157–178. [\[CrossRef\]](#)
37. Lirong, X. A Review of the Evolution of Technology Acceptance Models. *J. Grad. Stud. Cent. China Norm. Univ.* **2014**, *2014*, 155–161.
38. Cammann, C. Assessing the attitudes and perceptions of organizational members. In *Assessing Organizational Change: A Guide to Methods, Measures, and Practices*; Cammann, C., Ed.; Wiley: New York, NY, USA, 1983; pp. 71–138.
39. Smith, P.C.; Kendall, L.M.; Hulin, C.L. *The Measurement of Satisfaction in Work and Retirement: A Strategy for the Study of Attitudes*; Rand McNally & Company: Chicago, IL, USA, 1969.
40. Law, K.S.; Wong, C.S. Multidimensional constructs M structural equation analysis: An illustration using the job perception and job satisfaction constructs. *J. Manag.* **1999**, *25*, 143–160.
41. Mackenzie, S.B.; Podsakoff, P.M.; Podsakoff, N.P. Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Q.* **2011**, *35*, 293–334. [\[CrossRef\]](#)
42. Arfi, W.B.; Nasr, I.B.; Khvatova, T.; Zaied, Y.B. Understanding acceptance of eHealthcare by IoT natives and IoT immigrants: An integrated model of UTAUT, perceived risk, and financial cost. *Technol. Forecast. Soc. Chang.* **2021**, *163*, 120437. [\[CrossRef\]](#)
43. Alolah, T.; Stewart, R.A.; Panuwatwanich, K.; Mohamed, S. Determining the causal relationships among balanced scorecard perspectives on school safety performance: Case of Saudi Arabia. *Accid. Anal. Prev.* **2014**, *68*, 57–74. [\[CrossRef\]](#)
44. Abbad, M.M. Using the UTAUT model to understand students' usage of e-learning systems in developing countries. *Educ. Inf. Technol.* **2021**, *26*, 7205–7224. [\[CrossRef\]](#)
45. Venkatesh, V.; Davis, F.; Morris, M.G. Dead or Alive? The Development, Trajectory and Future of Technology Adoption Research. *J. Assoc. Inf. Syst.* **2007**, *8*, 267–286. [\[CrossRef\]](#)
46. Kalavani, A.; Kazerani, M.; Shekofteh, M. Acceptance of evidence based medicine (EBM) databases by Iranian medical residents using unified theory of acceptance and use of technology (UTAUT). *Health Policy Technol.* **2018**, *7*, 287–292. [\[CrossRef\]](#)
47. Magsamen-Conrad, K.; Upadhyaya, S.; Joa, C.Y.; Dowd, J. Bridging the divide: Using UTAUT to predict multigenerational tablet adoption practices. *Comput. Hum. Behav.* **2015**, *50*, 86–196. [\[CrossRef\]](#)
48. Šumak, B.; Šorgo, A. The acceptance and use of interactive whiteboards among teachers: Differences in UTAUT determinants between pre- and post-adopters. *Comput. Hum. Behav.* **2016**, *64*, 602–620. [\[CrossRef\]](#)
49. Malik, M. A Review of empirical research on Internet & Mobile banking in developing countries using UTAUT Model during the period 2015 to April 2020. *J. Internet Bank. Commer.* **2020**, *25*, 1–22.
50. Venkatesh, V.; Thong, J.Y.; Chan, F.K.; Hu, P.J.H.; Brown, S.A. Extending the two-stage information systems continuance model: Incorporating UTAUT predictors and the role of context. *Inf. Syst. J.* **2011**, *21*, 527–555. [\[CrossRef\]](#)
51. Churchill, G.A.; Surprenant, C. An Investigation into the Determinants of Customer Satisfaction. *J. Mark. Res.* **1982**, *19*, 491–504. [\[CrossRef\]](#)

52. Jones, M.A.; Suh, J. Transaction-specific satisfaction and overall satisfaction: An empirical analysis. *J. Serv. Mark.* **2000**, *14*, 147–159. [\[CrossRef\]](#)
53. Bolton, R.N. A Dynamic Model of the Duration of the Customer's Relationship with a Continuous Service Provider: The Role of Satisfaction. *Mark. Sci.* **1998**, *17*, 45–65. [\[CrossRef\]](#)
54. Kuo, Y.F.; Wu, C.M.; Deng, W.J. The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Comput. Hum. Behav.* **2009**, *25*, 887–896. [\[CrossRef\]](#)
55. Türkyılmaz, A.; Özkan, C. Development of a customer satisfaction index model: An application to the Turkish mobile phone sector. *Ind. Manag. Data Syst.* **2007**, *107*, 672–687. [\[CrossRef\]](#)
56. Park, E.; Lee, S.; Kwon, S.J.; Del Pobil, A.P. Determinants of Behavioral Intention to Use South Korean Airline Services: Effects of Service Quality and Corporate Social Responsibility. *Sustainability* **2015**, *7*, 12106–12121. [\[CrossRef\]](#)
57. Neal, J.D.; Sirgy, M.J.; Uysal, M. The role of satisfaction with leisure travel/tourism services and experience in satisfaction with leisure life and overall life. *J. Bus. Res.* **1999**, *43*, 153–163. [\[CrossRef\]](#)
58. Hutchinson, J.; Lai, F.; Wang, Y. Understanding the relationships of quality, value, equity, satisfaction, and behavioral intentions among golf travelers. *Tour. Manag.* **2009**, *30*, 298–308. [\[CrossRef\]](#)
59. Chen, C.F.; Chen, F.S. Experience quality, perceived value, satisfaction and behavioral intentions for heritage tourists. *Tour. Manag.* **2010**, *31*, 29–35. [\[CrossRef\]](#)
60. DeLone, W.; Mclean, E. The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *J. Manag. Inf. Syst.* **2003**, *19*, 9–30.
61. Dwivedi, Y.K.; Rana, N.P.; Tamilmani, K.; Raman, R. A meta-analysis based modified unified theory of acceptance and use of technology (meta-UTAUT): A review of emerging literature. *Curr. Opin. Psychol.* **2020**, *36*, 13–18. [\[CrossRef\]](#) [\[PubMed\]](#)
62. Zeithaml, V.A. Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *J. Mark.* **1988**, *52*, 2–22. [\[CrossRef\]](#)
63. Sweeney, J.C.; Soutar, G.N. Consumer perceived value: The development of a multiple item scale. *J. Retail.* **2001**, *77*, 203–220. [\[CrossRef\]](#)
64. Sheth, J.N.; Newman, B.I.; Gross, B.L. Why we buy what we buy: A theory of consumption values. *J. Bus. Res.* **1991**, *22*, 159–170. [\[CrossRef\]](#)
65. Demirgüneş, B.K. Relative Importance of Perceived Value, Satisfaction and Perceived Risk on Willingness to Pay More. *Int. Rev. Manag. Mark.* **2015**, *5*, 211–220.
66. Bauer, R.A. Consumer behavior as risk taking. In *Marketing: Critical Perspectives on Business and Management*; Routledge: New York, NY, USA, 1967; pp. 119–127.
67. Cox, D.F. *Risk Taking and Information Handling in Consumer Behavior*; Harvard University: Cambridge, MA, USA, 1967.
68. Bettman, J.R. Perceived Risk and Its Components: A Model and Empirical Test. *J. Mark. Res.* **1973**, *10*, 184. [\[CrossRef\]](#)
69. Peter, J.P.; Tarpey, L.X., Sr. A Comparative Analysis of Three Consumer Decision Strategies. *J. Consum. Res.* **1975**, *2*, 29. [\[CrossRef\]](#)
70. Iskandar, M.; Hartoyo, H.; Hermadi, I. Analysis of Factors Affecting Behavioral Intention and Use of Behavioral of Mobile Banking Using Unified Theory of Acceptance and Use of Technology 2 Model Approach. *Int. Rev. Manag. Mark.* **2020**, *10*, 41–49. [\[CrossRef\]](#)
71. Mano, H.; Oliver, R.L. Assessing the Dimensionality and Structure of the Consumption Experience: Evaluation, Feeling, and Satisfaction. *J. Consum. Res.* **1993**, *20*, 451–466. [\[CrossRef\]](#)
72. Jeon, H.M.; Sung, H.J.; Kim, H.Y. Customers' acceptance intention of self-service technology of restaurant industry: Expanding UTAUT with perceived risk and innovativeness. *Serv. Bus.* **2020**, *14*, 533–551. [\[CrossRef\]](#)
73. Tandon, U.; Kiran, R.; Sah, A.N. The influence of website functionality, drivers and perceived risk on customer satisfaction in online shopping: An emerging economy case. *Inf. Syst. E-Bus. Manag.* **2018**, *16*, 57–91. [\[CrossRef\]](#)
74. Wang, H.; Tao, D.; Yu, N.; Qu, X. Understanding consumer acceptance of healthcare wearable devices: An integrated model of UTAUT and TTF. *Int. J. Med. Inform.* **2020**, *139*, 104156. [\[CrossRef\]](#)
75. Talukder, S.; Chiong, R.; Dhakal, S.; Sorwar, G.; Bao, Y. A two-stage structural equation modeling-neural network approach for understanding and predicting the determinants of m-government service adoption. *J. Syst. Inf. Technol.* **2019**, *21*, 419–438. [\[CrossRef\]](#)
76. Slade, E.L.; Dwivedi, Y.K.; Piercy, N.C.; Williams, M.D. Modeling consumers' adoption intentions of remote mobile payments in the United Kingdom: Extending UTAUT with innovativeness, risk, and trust. *Psychol. Mark.* **2015**, *32*, 860–873. [\[CrossRef\]](#)
77. Sohn, H.K.; Lee, T.J.; Yoon, Y.S. Relationship between perceived risk, evaluation, satisfaction, and behavioral intention: A case of local-festival visitors. *J. Travel Tour. Mark.* **2016**, *33*, 28–45. [\[CrossRef\]](#)
78. Lee, C.K.; Yoon, Y.S.; Lee, S.K. Investigating the relationships among perceived value, satisfaction, and recommendations: The case of the Korea DMZ. *Tour. Manag.* **2007**, *28*, 204–214. [\[CrossRef\]](#)
79. Lee, J.; Chen, C.C.; Song, H.J.; Lee, C.K. Consumption of Movie Experience: Cognitive and Affective Approaches. *J. Qual. Assur. Hosp. Tour.* **2017**, *18*, 173–199. [\[CrossRef\]](#)
80. Oliveira, T.; Thomas, M.; Baptista, G.; Campos, F. Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Comput. Hum. Behav.* **2016**, *61*, 404–414. [\[CrossRef\]](#)
81. Rosseel, Y. lavaan: An R package for structural equation modeling. *J. Stat. Softw.* **2012**, *48*, 1–36. [\[CrossRef\]](#)

82. Gerbing, D.W.; Anderson, J.C. Improper solutions in the analysis of covariance structures: Their interpretability and a comparison of alternate respecifications. *Psychometrika* **1987**, *52*, 99–111. [[CrossRef](#)]
83. Hair, J.F.; Astrachan, C.B.; Moisescu, O.I.; Radomir, L.; Sarstedt, M.; Vaithilingam, S.; Ringle, C.M. Executing and interpreting applications of PLS-SEM: Updates for family business researchers. *J. Fam. Bus. Strategy* **2021**, *12*, 100392. [[CrossRef](#)]
84. Nunnally, J.C. *Psychometric Theory*, 2nd ed.; McGraw-Hill: New York, NY, USA, 1978.
85. Drolet, A.L.; Morrison, D.G. Do we really need multiple-item measures in service research? *J. Serv. Res.* **2001**, *3*, 196–204. [[CrossRef](#)]
86. Bagozzi, R.P.; Yi, Y. On the evaluation of structural equation models. *J. Acad. Mark. Sci.* **1988**, *16*, 74–94. [[CrossRef](#)]
87. Fornell, C.; Larcker, D.F. *Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics*; Sage Publications: Thousand Oaks, CA, USA, 1981; Volume 18, pp. 382–388.
88. Anderson, J.C.; Gerbing, D.W. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychol. Bull.* **1988**, *103*, 411–423. [[CrossRef](#)]
89. Park, K. (Ed.) Leisure psychology. In *Leisure Tourism Trend*, 2015th ed.; Newton Tourism and Leisure Research Institute: Daejeon, Republic of Korea, 2015; pp. 151–204.
90. APPLE. Available online: <https://www.apple.com/apple-vision-pro/> (accessed on 13 June 2024).
91. RAY-BAN. Available online: <https://www.ray-ban.com/usa/discover-ray-ban-meta-smart-glasses/clp> (accessed on 13 June 2024).
92. BBS. Available online: <https://bbs.hupu.com/626792362.html> (accessed on 13 June 2024).
93. Van Raaij, E.M.; Schepers, J.J. The acceptance and use of a virtual learning environment in China. *Comput. Educ.* **2008**, *50*, 838–852. [[CrossRef](#)]
94. Li, J. Blockchain Technology Adoption Examining the Fundamental Drivers. In Proceedings of the 2020 2nd International Conference on Management Science and Industrial Engineering, Osaka, Japan, 7–9 April 2020; pp. 253–260.

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