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Article

Dual Pathways to Loyalty: How Rational and Affective Factors Shape Revisit Intention in Sports Health Applications

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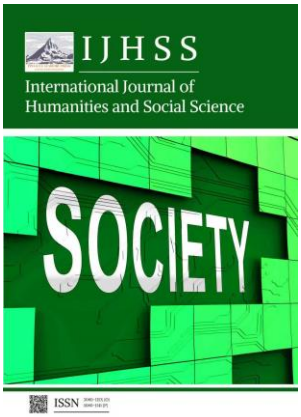

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Abstract: Objective: Amidst the swift evolution of mobile health, sports applications (Sapps) play a vital role in fostering wellness, yet they struggle with substantial user loss. This research explores the underlying psychological factors that drive users' intention to return to these platforms. Methods: Integrating the Technology Acceptance Model (TAM) and Expectation Confirmation Theory (ECT), a conceptual framework was developed featuring variables such as perceived ease of use, usefulness, trust, cost, and entertainment, alongside usage habits and satisfaction. Data were gathered from 358 university students in Seoul via convenience sampling. Statistical validation and hypothesis testing were performed using SPSS 28.0 and AMOS 28.0 through confirmatory factor analysis (CFA) and structural equation modeling (SEM). Results: Empirical evidence suggests that perceived usefulness is positively predicted by expected confirmation and ease of use. These three elements, in turn, serve as significant antecedents of user satisfaction. Furthermore, while satisfaction, usefulness, and entertainment significantly bolster revisit intention, perceived cost functions as a major inhibitor. However, the direct links between revisit intention and both usage habits and perceived trust were not statistically significant. Conclusion: The decision to reuse Sapps is a combined outcome of cognitive assessments (satisfaction and usefulness) and emotional experiences (entertainment), though it is tempered by cost considerations. These results offer strategic insights for the long-term viability of digital health interventions.

Keywords: sapps; TAM; ECM; perceived cost; revisit intention

1. Introduction

In the last ten years, the evolution of portable technology—notably smartphones and tablets—has fundamentally reshaped how information is shared and accessed. With the ubiquity of mobile connectivity, these devices now serve as the primary gateway to the digital world [1]. This technological shift has acted as a catalyst for the surge in sports applications (Sapps) aimed at fostering healthy lifestyles. Currently, software dedicated to weight control and physical exercise dominates the m-health market, representing more than 70% of the sector [2]. While extensive literature confirms that Sapps are instrumental in enhancing fitness habits and weight management [3], user retention remains a critical hurdle; recent data indicates a 45% abandonment rate for health-related apps [4]. Consequently, in an increasingly saturated and competitive market, identifying strategies to bolster user loyalty and encourage long-term reuse is of paramount importance for both developers and public health professionals.

Past inquiries into Sapps have frequently utilized frameworks like the Theory of Reasoned Action or Self-Determination Theory to understand initial adoption [5].

Nevertheless, much of this work remains siloed within single-theory perspectives, leaving a research gap regarding the multi-dimensional drivers of sustained usage. This study addresses this limitation by employing an empirical framework to examine the determinants of users' revisit intentions, specifically focusing on how various technical attributes shape user experience and perception.

2. Literature review

2.1. Perceived Usefulness

Within the framework of this research, perceived usefulness is defined as the extent to which individuals believe that utilizing Sapps provides functional support during their routine activities. Investigations into fitness application engagement reveal that the perceived utility of a platform is a fundamental precursor to user satisfaction, which subsequently drives the intention to remain an active user [6].

Furthermore, perceived ease of use reflects the user's subjective assessment regarding the simplicity and effortlessness of operating Sapps. Extensive research in the m-health domain suggests that a user-friendly interface significantly enhances the perceived value of an application. Operational simplicity has been shown to directly reinforce both the perceived utility and the behavioral intent of users within the context of health and fitness tools [7]. Consequently, this study suggests that the usability of Sapps is a key driver of their perceived value, leading to the following hypothesis:

H1. Perceived ease of use positively influences perceived usefulness.

Expected confirmation represents the discrepancy between a user's prior anticipations and the actual functional performance encountered after adopting the software. Analysis of consumer behavior in health-related applications indicates that when an app's performance aligns with or exceeds initial expectations, it substantially elevates both user satisfaction and the perceived utility of the platform [7]. Essentially, this research posits that users approach Sapps with specific performance benchmarks; fulfilling these requirements enhances the perception of usefulness and encourages repeat usage. Based on this, the study proposes:

H2. Expected confirmation positively influences perceived usefulness.

2.2. Satisfaction

In this research, satisfaction is viewed as a holistic post-adoption appraisal formed by users, which is primarily determined by utility, operational simplicity, and the degree of expectation fulfillment. The usability of Sapps is intrinsically linked to the cognitive effort required for navigation; as the necessity for user exertion diminishes, perceived ease of use rises, thereby fostering higher levels of gratification. Within the broader mobile application landscape, empirical evidence consistently identifies both functional value and operational ease as pivotal drivers of user contentment. Based on these foundations, the following relationships are proposed:

H3. Perceived ease of use positively influences satisfaction.

H4. Perceived usefulness positively influences satisfaction.

Expected confirmation provides a basis for users to evaluate their experience by comparing pre-use expectations with post-adoption perceptions. This mechanism is fundamental in shaping user attitudes toward digital services. Previous scholarship has established a robust correlation between the fulfillment of expectations and satisfaction, particularly within the domain of technology-mediated products such as digital learning platforms [8]. Building on this consensus, this study contends that such confirmation is a vital precursor to satisfaction in the specific context of Sapps, leading to the following hypothesis:

H5. Expected confirmation positively influences satisfaction.

2.3. Revisit Intention

Revisit intention is defined as the user's decision to return to a specific application following their initial experience. While research on repeat intention is prevalent in the travel and traditional service sectors, there is less evidence specifically focused on sports applications [9]. This research seeks to address this gap by exploring several key determinants of revisit intention, including utility, trust, entertainment, habits, cost, and satisfaction.

The capacity of an application's utility to predict behavioral trends is well-supported, with findings indicating that perceived benefits significantly foster the intent to return. Investigations into digital service platforms have verified that when users perceive high functional benefits, their intention to reuse the service increases substantially [10]. To summarize, perceived usefulness is considered a crucial factor influencing revisit intention, leading to the following hypothesis:

H6. Perceived usefulness positively influences revisit intention.

Consistency in empirical studies shows that user gratification is a primary driver of repurchase or revisit behavior across various mobile contexts [11]. In the Sapps domain, when an app's functional design aligns with user requirements, the probability of repeat usage increases, driven by positive emotional responses and overall satisfaction [12]. Enhancing user contentment is therefore likely to promote an increase in the intention to return. Based on this, the study proposes:

H7. Satisfaction positively influences revisit intention.

Perceived trust is a significant variable influencing the intent to return, representing the user's comprehensive judgment regarding the reliability, security, and privacy standards of the platform [13]. Evidence suggests that high levels of trust mitigate psychological barriers to reuse, thereby fostering a stronger user-application bond and increasing the willingness to engage [14]. Therefore, the following hypothesis is proposed: H8. Perceived trust positively influences revisit intention.

Perceived entertainment refers to the level of joy or gratification a user feels when interacting with a service. Its role in enhancing revisit intention is increasingly recognized as a critical predictor of user involvement, contributing to higher satisfaction and willingness to use. Studies on running applications show that gamified or entertaining features significantly enhance the likelihood of repurchasing, thereby improving user attraction and retention [15]. Consequently, the enhancement of enjoyment plays a connecting role in the intent to return to the application, leading to the following hypothesis:

H9. Perceived entertainment positively influences revisit intention.

Usage habits represent the automatic behavioral tendencies developed through frequent and regular interaction with Sapps. Research indicates that as these habits become more automated, users are significantly more likely to return to the platform [16]. Furthermore, perceived cost is defined as the subjective assessment of the sacrifices or expenses a user believes are necessary to access a service, which serves as a key determinant of the intent to reuse [17]. Thus, the following hypotheses are proposed:

H10. Perceived cost positively influences revisit intention.

H11. Usage habits positively influences revisit intention.

3. Methodology

3.1. Research subjects

Data collection was conducted through a convenience sampling technique targeting undergraduate students enrolled at a four-year academic institution in Seoul, South Korea. At the commencement of the survey, a filtering question was utilized to verify the participants' experience with Sapps, ensuring that only active users were included in the research cohort. To maintain high ethical standards and participant anonymity, respondents were explicitly instructed to withhold all personally identifiable information, including full names, contact numbers, and email addresses. Furthermore, all individuals

were briefed on their voluntary participation and their entitlement to withdraw from the study at any stage without consequence. Although the initial phase yielded 389 completed surveys, a rigorous data cleaning process was performed to exclude incomplete or ineligible submissions. This resulted in a final dataset of 358 valid responses for the subsequent empirical analysis. Detailed descriptive characteristics of this study population are provided in Table 1.

Table 1. Descriptive statistical information on participants.

Category	Item	Frequency	Percentage%
Gender	Male	201	56.15%
	Female	157	43.85%
Education	Undergraduate	252	70.39%
	Graduate	74	20.67%
	Other	35	8.94%
Age	18 to 24	251	70.1%
	25 to 29	72	20.1%
	30 and above	34	9.5%

3.2. Research method

The processing and interpretation of the gathered data were facilitated by SPSS 28.0 and AMOS 28.0. The analytical procedure commenced with frequency distributions to profile the demographic makeup of the respondents. To establish the psychometric integrity of the measurement tools, Cronbach's alpha and confirmatory factor analysis (CFA) were implemented to verify reliability and construct validity. Furthermore, the distinctness of the theoretical constructs was confirmed through an assessment of discriminant validity via correlation analysis. In the concluding phase of the statistical evaluation, the hypothesized framework and its corresponding paths were tested using a structural equation modeling (SEM) approach.

4. Results

4.1. Measurement Model Validation

CFA was conducted to examine the validity and reliability of all constructs. The analysis employed the maximum likelihood (ML) method, which assumes multivariate normality. Model fit was assessed using multiple indices, including the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), the normed chi-square (χ^2/df), and the Root Mean Square Error of Approximation (RMSEA), to evaluate the appropriateness of the conceptual and measurement model. As shown in Table 2, all fit indices met acceptable thresholds: χ2/df=1.905, TLI=0.961, CFI=0.968, RMSEA=0.059.

Table 2. Confirmatory factor analysis and reliability analysis.

Factor	Item	Standardized loading	AVE	Composite reliability	Cronbach's alpha
Perceived ease of use	PEOU1	0.887	0.853	0.946	0.944
	PEOU 2	0.935			
	PEOU3	0.947			
Perceived usefulness	PU1	0.894	0.817	0.931	0.930
	PU2	0.915			
	PU3	0.903			
Expected confirmation	EC1	0.902	0.822	0.933	0.932
	EC2	0.910			
	EC3	0.908			

Perceived trust	PT1	0.884	0.740	0.895	0.901
	PT2	0.833			
	PT3	0.863			
Perceived entertainment	PE1	0.880	0.771	0.910	0.909
	PE2	0.919			
	PE3	0.833			
Perceived cost	PC1	0.859	0.790	0.919	0.916
	PC2	0.904			
	PC3	0.903			
Usage habits	UH1	0.884	0.777	0.913	0.912
	UH2	0.911			
	UH3	0.848			
Satisfaction	SA1	0.925	0.861	0.949	0.949
	SA2	0.921			
	SA3	0.937			
Revisit intention	RI1	0.918	0.805	0.925	0.895
	RI2	0.916			
	RI3	0.857			

$\chi 2$=548.61(df=288, p=.000), $\chi 2$/df=1.905, TLI=0.961, CFI=0.968, RMSEA=0.059.

To assess convergent validity, standardized factor loadings, average variance extracted (AVE), and construct reliability (CR) were examined. All standardized loadings ranged from 0.833 to 0.947 (exceeding 0.5), AVE values ranged from 0.740 to 0.861 (exceeding 0.5), and CR values ranged from 0.895 to 0.949 (exceeding 0.7), confirming satisfactory convergent validity. Following the CFA, internal consistency reliability was evaluated using Cronbach's alpha. All constructs demonstrated alpha coefficients above 0.7, indicating high scale reliability.

Furthermore, discriminant validity was verified by comparing the square root of the AVE for each construct with its correlation coefficients with other constructs. The smallest AVE value in this study was 0.740 (for perceived trust), while the largest squared correlation coefficient was 0.523 (0.723^2), confirming that all constructs demonstrate adequate discriminant validity.

4.2. Structural Model Testing

The structural model was evaluated by analyzing the relationships among the key variables, with the results presented in Table 3.

Table 3. Model testing results.

Hypothesis	Paths	Standardized Regression Coefficient	Standardized Error	t -value	Testing
H1	PEOU→PU	0.524	0.041	12.780**	Supported
H2	EC→PU	0.661	0.046	14.370**	Supported
H3	PEOU→SA	0.491	0.059	8.322**	Supported
H4	PU→SA	0.545	0.047	11.596**	Supported
H5	EC→SA	0.455	0.053	8.585**	Supported
H6	PU→RI	0.325	0.062	5.242**	Supported
H7	SA→RI	0.287	0.053	5.415**	Supported
H8	PT→RI	0.107	0.082	1.305	Rejected
H9	PE→RI	0.279	0.048	5.813**	Supported
H10	PC→RI	0.521	0.051	10.216**	Supported
H11	UH→RI	0.124	0.083	1.494	Rejected

χ2=588.365, df=297, p=.000), χ2/df=1.981, TLI=0.937, CFI=0.941, RMSEA=0.065, *p<.05, **p<.01.

The model fit indices indicated an acceptable fit: χ^2/df = 1.981, TLI = 0.937, CFI = 0.941, RMSEA = 0.065. Regarding the two hypotheses predicting perceived usefulness, both perceived ease of use ($\beta = 0.524$, $p < 0.01$) and expected confirmation ($\beta = 0.661$, $p < 0.01$) had significant positive effects. Thus, H1 and H2 were supported. For the three hypotheses predicting satisfaction, perceived ease of use ($\beta = 0.491$, $p < 0.01$), perceived usefulness ($\beta = 0.545$, $p < 0.01$), and expected confirmation ($\beta = 0.455$, $p < 0.01$) all exerted significant positive influences. Therefore, H3, H4, and H5 were supported. Of the six hypotheses predicting revisit intention, perceived usefulness ($\beta = 0.545$, $p < 0.01$), satisfaction ($\beta = 0.287$, $p < 0.01$), perceived entertainment ($\beta = 0.279$, $p < 0.01$), and perceived cost ($\beta = -0.521$, $p < 0.01$) showed significant effects, with perceived cost having a negative influence. Consequently, H6, H7, H9, and H10 were supported. In contrast, perceived trust ($\beta = 0.107$, $p > 0.05$) and usage habits ($\beta = 0.124$, $p > 0.05$) did not significantly affect revisit intention, leading to the rejection of H8 and H11. In summary, all proposed hypotheses and the overall model were supported, with the exception of H8 and H11.

5. Discussion

This research integrates TAM, ECT, and a hedonic motivation perspective to systematically investigate the determinants of persistent Sapps usage. The results indicate that the intention to revisit these applications is a multifaceted process determined by a combination of cognitive evaluations and emotional experiences.

Empirical evidence suggests that expected confirmation significantly and positively predicts perceived usefulness ($\beta = 0.661$). This implies that when the actual performance of a sports app aligns with or surpasses initial user anticipations, the perceived utility of the tool is substantially enhanced. Similarly, perceived ease of use was found to have a positive impact on perceived usefulness ($\beta = 0.524$). This indicates that users attribute higher value to applications that offer intuitive operation and functional convenience, which aligns with existing scholarly consensus [18]. Furthermore, the combination of perceived ease of use, utility, and expectation fulfillment serves as the primary foundation for user satisfaction [19]. All hypothesized paths in this framework received statistical validation.

The intent to return to Sapps is driven by diverse psychological pathways. Both perceived usefulness ($\beta = 0.325$) and satisfaction ($\beta = 0.287$) exert significant positive effects on revisit intention [20]. Users are more likely to reuse platforms that effectively facilitate their fitness objectives while providing a gratifying experience. Additionally, perceived entertainment ($\beta = 0.279$) is a critical determinant of repeat usage, highlighting that users place high value on the hedonic features of Sapps [21]. Applications that offer engaging, gamified, or immersive content are more effective at stimulating long-term retention. Notably, this study identified perceived cost as a significant negative factor influencing revisit intention ($\beta = -0.521$). Finally, the direct impact of perceived trust and habitual use on the intent to return was not statistically supported. In a highly competitive digital market, trust may be viewed as a baseline requirement for initial adoption, whereas long-term loyalty depends more heavily on the ongoing perceived value of the software itself.

By successfully synthesizing TAM, ECT, and hedonic motivation theories within the context of sports apps, this research confirms the complementary roles of rational and affective factors in explaining sustained usage behavior. This contribution enriches the theoretical landscape of health information technology adoption. However, certain limitations must be acknowledged. The study's sample consisted exclusively of university students in Seoul, South Korea. Future inquiries should incorporate more diverse demographics, including various age groups, cultural backgrounds, and health profiles, to improve the generalizability of these findings. Moreover, subsequent research could

further explore the mediating roles of satisfaction and utility within this theoretical framework.

6. Conclusion

In summary, this research provides comprehensive evidence that the intention of users to return to sports applications is shaped by a dual mechanism involving both rational cognitive evaluations and affective emotional experiences. The findings reveal that while perceived usefulness and satisfaction constitute the logical basis for reuse, perceived entertainment offers a critical hedonic dimension that significantly bolsters long-term engagement. These positive drivers, however, are notably constrained by perceived cost, which remains a substantial barrier to sustained participation in an increasingly saturated digital health market. Interestingly, the study concludes that perceived trust and usage habits do not exert a direct influence on revisit intention. This suggests that in a highly competitive environment, these factors have evolved into fundamental baseline expectations—essential prerequisites for initial adoption—rather than active motivators for continued usage. Consequently, to ensure the sustainable development of mobile health tools, developers and health practitioners should focus on enhancing functional value and emotional appeal while strategically managing the costs associated with user participation. These insights offer a robust theoretical framework for understanding the persistent use of digital health technologies.

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