A STUDY ON THE INFLUENCE ON CONTINUANCE INTENTION TO USE OF MOBILE PAID CONTENTS

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Abstract. *In a saturated mobile marketplace, it is necessary to make money with subscription-based applications (apps) rather than selling apps or app-downloading. And it requires analysis of the factors that affect continuous usage of the apps. In this study, we constructed a new model by adding the variable 'curiosity' to the post-acceptance model (PAM). The PAM was applied because we need a model that considers 'continuance intention' as a dependent variable and the intention can lead to generating revenue by continuous usage with subscription-based apps. To verify the moderating effect of curiosity, a multi-group analysis was conducted. As a result of the analysis, we can find that the variables of the PAM influence the intention of continuous usage and that curiosity as a moderating variable influences each factor.*
Keywords: Paid contents, Continuance intention, Curiosity, Post acceptance model

1. **Introduction and Related Works.** In Korea, the rate of Internet access per household increased from 92.7% in 2005 to 99.5% in 2019. Among the information and communication devices that can be used per household, 94.9% are smart devices, and the number of people using the Internet with smartphones is increasing. In the ranking of the purpose of using the Internet, communication was the highest at 95.4%, and leisure activities and information acquisition were 94.0% [1].

Consumers will no longer just buy and download apps in the saturated mobile app market, and companies are constantly inducing purchases of paid content in apps to prevent churn by consumers [2]. Taking these into account, we want to understand the consumers' intention to use and to study curiosity which is a new factor that influences the intention to use. For this reason, the following research questions were presented.

1) When will consumers maintain continuous usage of the service?
2) How can we induce the purchase of mobile application content?

To answer the above research questions, this study uses the post-acceptance model (PAM). When making profits by increasing payments within subscription-based apps in the saturated mobile app market, it was determined that PAM, in which user satisfaction and perceived usefulness, lead to continuous use intentions, is suitable for this study.

PAM is an extended model of the technology acceptance model (TAM). Bhattacherjee [3] recognized that the TAM had limitations in explaining the diffusion process and consumers' intention of continuous usage for products and conducted a study on additional factors considering the intention of continuous usage. Related research includes adding

variables such as perceived security and relevance as the subject of Internet payment using PAM and confirming meaningful results with user satisfaction [4].

We analyze by adding curiosity as a new factor to PAM. Curiosity is an essential element for exploratory behavior and can be understood as a human desire to acquire new knowledge and sensory information [5]. In general, research on curiosity has shown consistent results that curiosity is an important decisive factor in human inquiry behavior not only in psychology but also in other fields such as business administration or education [6]. Curiosity can be said to be a basic human need that motivates human inquisitive behavior, helping to explore various types of stimuli [7]. In this way, by putting the curiosity that can confirm the fundamental needs of humans as a moderating variable of PAM, we tried to provide meaningful indicators in marketing to companies and operators by identifying factors that influence users' intention of continuous usage of mobile paid content.

This paper is organized as follows. Section 2 introduces the study model through an existing study review, and the research methods and procedure. Section 3 explains the results of the analysis. Concluding remarks are given in Section 4.

2. **Research Model and Methodology.** In this study, a research model was designed and a research hypothesis was established based on the major previous studies. The research model was constructed as shown in Figure 1. Based on the PAM, confirmation of expectation of mobile paid content users was set as an exogenous variable, perceived usefulness and satisfaction as a parameter, and continuance intention as a dependent variable. By setting curiosity as a moderating variable on the intention to use it, we want to see how each factor affects it.
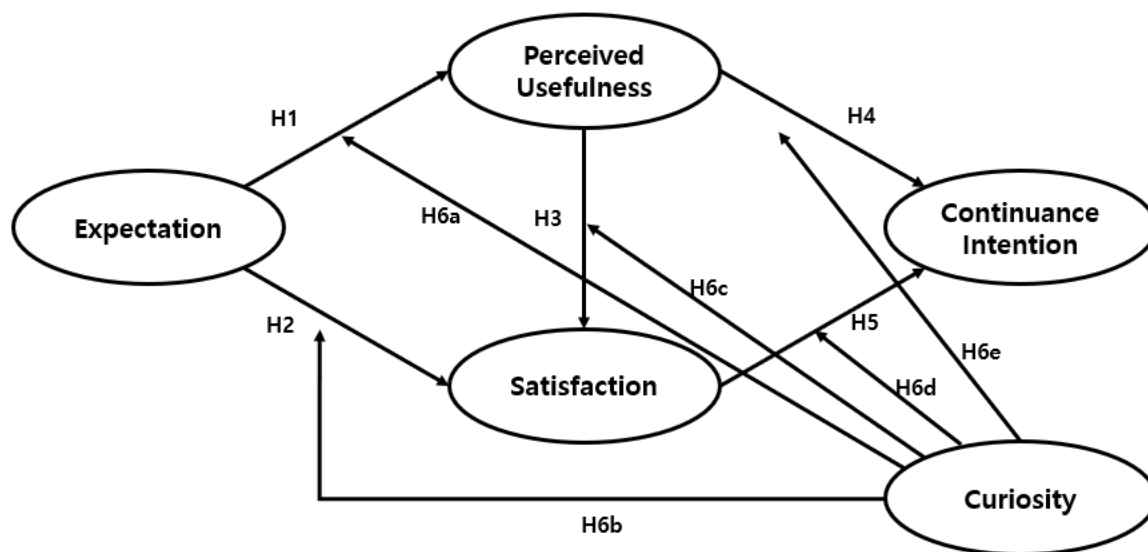

FIGURE 1. The research model of this study

Confirmation of expectation refers to the difference between prior expectation and actual use results and is an important concept constituting the PAM. If the actual results of use are higher than expected before users use a service and if the expectations are met, the users will be satisfied, and these expectations will be met by the user as thinking that the service is useful. In research on Internet banking [3], e-learning [9], and a study verifying extended expectation-confirmation theory for mobile Internet services [12], it has been confirmed that expectations have a significant effect on perceived usefulness and satisfaction. Perceived usefulness was also found that it has a significant effect on the continuance intention using satisfaction as well. Based on these facts, this study established the following hypotheses.

H1. Expectations will have a significant effect on perceived usefulness.
H2. Expectations will have a significant effect on satisfaction.
H3. Perceived usefulness will have a significant effect on satisfaction.
H4. Perceived usefulness will have a significant effect on continuance intention.
H5. Satisfaction will have a significant effect on continuance intention.

In this study, a hypothesis was set up to confirm whether curiosity plays a moderating role for each hypothesis.

H6a~H6e. Curiosity will have a moderating effect.

The data for this study were collected through an Internet survey targeting users who had used and paid for mobile paid content. We collected 206 data and a total of 200 survey data excluding unfaithful data was finally used. For this study, the operational definition and metrics of the model were adjusted in previous studies related to PAM and slightly modified for mobile paid content. Appendix lists the measurement and scale items. All constructs were measured with multiple items on a five-point Likert scale, anchored between 'strongly disagree' and 'strongly agree'.

3. Results of Analysis.

3.1. **Factor analysis and reliability analysis.** Factor analysis to check how accurately what you want to measure for each measurement item and reliability analysis to check how much the same answer comes out when asked about the measurement items were conducted with a statistics software package, AMOS 24.0.

In order to check the high goodness of fit, the step of removing the variables of which the value of squared multiple correlation (SMC) has 0.4 or lower was performed with AMOS 24.0. SMC is used to determine how much a measured variable describes a latent variable. As a result of the analysis, the variables 'Curiosity 5', 'Expectations 1 and 2' and 'Continuance Intention 4' were removed. The factor analysis results are shown in Table 1.

TABLE 1. Results of exploratory and confirmatory factor analysis

Factors	SMC	Factors	SMC
Perceived Usefulness 1	.519	Expectation 1	**.203**
Perceived Usefulness 2	.636	Expectation 2	**.168**
Perceived Usefulness 3	.775	Expectation 3	.647
Perceived Usefulness 4	.754	Expectation 4	.781
Continuance Intention 1	.806	Curiosity 1	.823
Continuance Intention 2	.653	Curiosity 2	.809
Continuance Intention 3	.613	Curiosity 3	.861
Continuance Intention 4	**.191**	Curiosity 4	.874
Satisfaction 1	.656	Curiosity 5	**.282**
Satisfaction 2	.745		
Satisfaction 3	.755		
Satisfaction 4	.526		

If the construct reliability (C.R) is 0.5 or more, the model has construct validity. The average variance extraction (AVE) represents the size of the variance that the index can explain about the concept. If the AVE is more than 0.5, convergent validity is considered secured. The feasibility assessment of the confirmatory analysis is shown in Table 2 [21].

3.2. **Model fit.** Structural equation modeling analysis was performed using AMOS 24.0 to determine the suitability and confirmatory factor analysis of the proposed model. The assessment of fitness for a structural model is a procedure to examine how well the model

TABLE 2. Confirmation factor analysis result

	Expectation	Perceived Usefulness	Satisfaction	Continuance Intention	Curiosity
C.R	.832	.657	.890	.869	.955
AVE	.713	.884	.670	.690	.942

fits the hypothesis. The analysis results of the structural model in this study are shown in Table 3. As a result, it was found that the model fit was satisfactory when compared with the indicators used as general evaluation criteria. The general evaluation criteria are good when the value of normed chi-square is less than 3, the goodness of fit index (GFI) is 0.8 or higher, and the root mean square error of approximation (RMSEA) is less than 0.05. The RMSEA less than 0.1 is acceptable. Finally, when the comparative fit index (CFI) is 0.8 or higher, the model fit is shown to be satisfactory.

TABLE 3. Structural equation modeling analysis result

	χ^2/df	GFI	RMSEA	CFI
Model fit	1.851	0.863	0.065	0.938
Criteria	≤ 3	≥ 0.8	≤ 0.1	≥ 0.8

3.3. **Path coefficient result.** To verify each hypothesis, a path coefficient test for the study model was conducted. As a result of the analysis, all path coefficients were found to be significant, and these are shown in Table 4. All paths satisfy the conventional level of significance p-value < 0.05. Estimate is the unstandardized regression coefficient, S.E is the standard error, and C.R is the same as the T value in the regression analysis.

TABLE 4. Path coefficient result

Path	Estimate	S.E	C.R	p-value
Expectation $\rightarrow$ Perceived Usefulness	0.968	.097	10.034	< 0.001
Expectation $\rightarrow$ Satisfaction	0.429	.145	2.956	< 0.003
Perceived Usefulness $\rightarrow$ Satisfaction	0.281	.125	2.236	< 0.025
Satisfaction $\rightarrow$ Continuance Intention	0.438	.115	6.362	< 0.001
Perceived Usefulness $\rightarrow$ Continuance Intention	0.632	.099	3.802	< 0.001

3.4. **Multi-group analysis.** To verify the moderating effect of curiosity, a multi-group analysis was conducted to distinguish the group with curiosity and the group without curiosity. Multi-group analysis sets equivalence constraints between groups. For the path coefficient, χ^2 of a model with an equivalence constraint is compared with χ^2 of a model without an equivalent constraint, and if χ^2 is greater than 3.84 when the difference in degrees of freedom is 1, it is judged that there is a moderating effect [10]. After calculating the average of the survey target's curiosity measurement variables, if it was 3.0 or higher, it was classified as a group with curiosity, and if it was less than 3.0, it was classified as a group without curiosity.

As a result of the analysis, there was no significant difference between the non-constrained model and the factor load-constrained model. ($\Delta\chi^2 = 9.224$, df $= 8 < 15.51$). This means that both groups have the same perception of the measurement tools. Since the measurement invariance or measurement equivalence of the factor load was verified, multi-group path analysis as the next step was performed. As a result of performing the analysis with path constraints, it was verified that there was no moderating variable because $\Delta\chi^2$ for each hypothesis-setting path did not have a score higher than 3.84.

As for the influence on the continuance intention, the difference in the relationship between the factors of the two groups was examined. The path coefficient estimates of the structural model for the influence on factors of each group are shown in Table 5. Specifically, the influence of satisfaction on the continuance intention was significant for the group with curiosity (B = 0.450, $p < 0.001$), but the non-curiosity group was not significant (B = 0.577, $p < 0.071$). Also, the effect of confirmation of expectation on the satisfaction was significant for the group with curiosity (B = 0.466, $p < 0.009$), but not for the group without curiosity (B = 0.166, $p < 0.423$). In other words, the group with curiosity has a moderating effect on all factors, but the group without curiosity does not.

TABLE 5. Effect analysis result

Group	Distribution	Estimates	S.E	C.R	p-value
With Curiosity	Expectation → Perceived Usefulness	.872	.137	6.369	< .001
	Expectation → Satisfaction	**.466**	**.180**	**2.598**	**< .009**
	Perceived Usefulness → Satisfaction	.337	.152	2.223	< .026
	Satisfaction → Continuance Intention	**.450**	**.110**	**4.075**	**< .001**
	Perceived Usefulness → Continuance Intention	.531	.112	4.729	< .001
Without Curiosity	Expectation → Perceived Usefulness	.895	.195	4.594	< .001
	Expectation → Satisfaction	**.166**	**.207**	**.801**	**< .423**
	Perceived Usefulness → Satisfaction	.450	.217	2.072	< .038
	Satisfaction → Continuance Intention	**.577**	**.319**	**1.808**	**< .071**
	Perceived Usefulness → Continuance Intention	.582	.242	2.408	< .016

4. **Conclusion and Discussion.** This study examined the possibility of the influence of curiosity on the continuance intention as a new behavioral determinant of mobile paid content. Consistent differences with the verification of construct equivalence of the curiosity of continuous use of mobile paid content were confirmed. The analysis results are as follows.

4.1. **Conclusion.** First, construct equivalence exists among the groups of curiosity about the factor scale of mobile paid content. This means empirical evidence that the results can be derived from the same questionnaire because the scale responses among the groups of curiosity are the same. Second, the relationship of each factor according to curiosity was investigated and it was found that the group with curiosity gained perceived usefulness and tried to use it continuously compared to the group without curiosity. This means that when the element of curiosity is increased and new usefulness is perceived, the consumer continues to make purchases within the mobile app. Considering the results of this study, it is expected that higher efficiency can be brought to marketing strategies through market segmentation in the industry of mobile paid content.

4.2. **Discussion.** The academic implications of this study are as follows.

First, an empirical study was conducted on the continuance intention of targeting domestic consumers who have been fixed in the mobile paid content market. Second, a model with a variable curiosity was designed on the continuance intention based on the PAM. We check whether expectation, perceived usefulness, and satisfaction, rather than factors such as the first purchase of technology and services, which have been actively studied so far, affect the continuance intention. Besides, we set a new variable of curiosity to learn more about the factors that determine consumer behavior. It could provide a radically new perspective. Approaching the consumption activities of mobile contents centering on curiosity and expectation could be able to provide answers from a new perspective to fundamental questions such as 'when will consumers maintain continuance intention of the services?'.

The practical implications of this study in the use of mobile paid content are as follows.

First, this study provides meaningful implications on a timely subject by confirming the factors affecting continuous use at a time when there is a lack of research on mobile paid content. Second, it is necessary to study and develop apps that can meet consumer satisfaction and perceived usefulness as the results of satisfying the expectations of consumers' curiosity by increasing the convenience of use of contents and grasping the needs of consumers.

200 survey data were used in this study. Since the sample error is 7% at the 95% confidence level based on all users of mobile devices, the current error range is wide. Also, other factors besides curiosity were not used. In the follow-up study, the preceding factors for curiosity will be added and analyzed using more survey data.

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Appendix

Factors	Definition	Measurement item	Reference
Confirmation of Expectation	Recognize whether users have expectations for a technology or service they have already experienced.	1) When I use mobile paid content, I have anticipation for the cost performance. 2) I value the quality of mobile paid content. 3) From the experience of mobile paid content, I am looking forward to using content in the future. 4) When I use mobile paid content, I can receive useful services.	[3,8,9]
Perceived Usefulness	Consumer (user) perception of the benefits expected from using the app.	1) I got the information through mobile paid content. 2) I can use paid content for information and cultural life. 3) I have found that using mobile paid content is useful in my life. 4) I think that mobile paid content is useful in my spare time.	[9,20]
Satisfaction	Service, content cost is the perceived level of value that an individual is willing to pay for the service.	1) The content and quality of the mobile paid content that I use is more satisfactory than I thought. 2) After using mobile paid content, I am satisfied with the content and quality of the content compared to the cost of payment. 3) I am satisfied with the service of mobile paid content. 4) I felt more satisfactory than dissatisfactory while using mobile paid content.	[11-14]
Continuance Intention	Loyalty to existing service providers, and intention to continue to use existing services.	1) I plan to continue using mobile paid content. 2) I would recommend mobile paid content to others. 3) My mobile paid content is a part of my life. 4) There is no new content to replace my mobile paid content.	[3,15]
Curiosity	Attitudes to stimulate various human inquiry behaviors by stimulating curiosity with experiences and information that have not been tried.	1) I want to know more about mobile paid content. 2) I am interested in information from mobile paid content. 3) I am curious about mobile paid content. 4) I am interested in mobile paid content. 5) Looking at the new mobile paid content, I want to try it.	[16-19]