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Free to Premium in Mobile TV Service: Intrinsic and Extrinsic Motivational Factors Affecting Free Users' Paid Subscription Intention

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ABSTRACT

Mobile TV refers to the service that provides live broadcasting and video-on-demand content through a mobile device. In addition to the advertisement as the early-stage revenue model, the paid subscription model has emerged as a more sustainable revenue source for mobile TV services. In this study, with the surveys of 450 free mobile TV users, we examine the motivational factors influencing their intention to adopt a paid subscription model. Results show that three extrinsic motivations, price fairness, subjective norm, and mobile TV utilization, are positively associated with free users' paid subscription intention. In contrast, intrinsic motivations, such as hedonic need, spatiotemporal convenience, and self-efficacy, have no significant influence on the intention. We also found that the expected value is positively associated with attitude toward mobile TV service, also positively influencing the paid subscription intention.

Keywords: Mobile TV, Paid Subscription, Intrinsic Motivation, Extrinsic Motivation, Expected Value

Ⅰ. Introduction

With the development of higher quality mobile devices and faster data transfer rates, mobile TV service by telecommunication service providers and broadcasting networks has been drawing more users. Mobile TV service is typically provided free of charge for basic content. Free service has been useful in acquiring new users, as it could lower the entry barrier for potential users. While advertisement is the main revenue model for mobile TV, similar to the traditional TV model, the subscription model is rising as a new and more sustainable revenue source (Evens et al., 2011). For more premiere content and services, users are expected to pay the regular subscription fee. It is helpful for the service providers to pursue profit-

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ability and sustainability while retaining the acquired free users and turning them into subscribing users are challenging tasks for them (Gu et al., 2018). But, our understanding is still lacking on the factors affecting the users' paid subscription adoption.

To address the gap, our study aims to identify the factors affecting the users' intention to turn from using a free service to adopting a paid subscription service. Previously, there have been studies on the adoption of mobile services. In mobile service, adoption research is more about the adoption of applications or services than the adoption of technology itself, such as business software, entertainment, and personal productivity applications (Orlikowski and Ianco, 2001). In addition, adoption research goes one step further from a simple analysis of the adoption process, seeking explanations of why certain adoption behaviors are observed (Pedersen and Ling, 2003). To find the reason for adopting mobile services, we focus on psychological perspectives, such as users' motivations for subscribing to mobile TV services.

We employ six motivations—hedonic needs, spatiotemporal convenience, self-efficacy, price fairness, subjective norm, and mobile TV utilization—of mobile TV users to use the service to verify the relationships between those motivations and intention to use paid subscription mobile TV services. Intrinsic motivations, hedonic need, spatiotemporal convenience and self-efficacy will be essential motives for mobile TV users. Since a hedonic need is activated when a customer behaves to experience a feeling of excitement (Banib et al., 1994), a user who seeks fun through TV will be motivated by this motivation. Also, compared to traditional TV, mobile TV users want to access the service anytime and anywhere. Self-efficacy is defined as users' judgments of their capabilities to do any actions with whatever skills they have (Bandura, 1994). Confidence to handle mobile TV freely will be a good motivation for subscribing to paid content. Regarding extrinsic motivations, we employed price fairness, subjective norm and mobile TV utilization. A reasonable price is essential for customers to make them pay for any services and products (Bolton et al., 2003). If mobile TV users think that the price is fair, users' recognition of fairness will positively affect their use of the service. Furthermore, social motivation induced by an important person is counted as crucial extrinsic motivation (Kaufmann, 2011). We define mobile TV utilization as the level of mobile TV usage of users. Users who access the mobile TV service more frequently and for longer will have a more positive connection to a paid service subscription.

For the study, we collected data from 450 mobile TV service users in South Korea using mobile TV applications on their mobile devices but not paying for the service, i.e., free users. We identified those samples since the objective of this study is to examine the factors affecting free users' intention to pay the subscription fee for mobile TV services. The results show that expected value significantly influences attitude toward paid subscriptions, and the attitude impacts intention to pay the subscription fee for mobile TV service. For motivational aspects, price fairness and subjective norm significantly influence paid subscription intention, while hedonic needs and spatiotemporal convenience are not meaningful factors. The results also show the degree of mobile TV usage significantly impacts paid subscription intention.

Our study contributes to the literature and practices in different aspects. First, this study extends and integrates prior literature on mobile service adoption, and usage in the context of mobile TV paid subscriptions. Specifically, the findings of this study emphasize the role of extrinsic motivations (i.e., price fairness, subjective norm) over intrinsic motivations

in forming the paid subscription intention. Moreover, unlike previous studies, this study was conducted on mobile TV users using the service for free and not using a paid subscription. Studies related to behavioral intention were mainly conducted on consumers who did not use the product or service. Still, we investigated the intention to use paid subscriptions for consumers who are using it for free. Practically, this study helps service providers transform free users into paying subscribers by suggesting the importance of promoting motivations, meeting expected value, and extending free service usage. For example, to promote one of the users' motivations, service providers may consider a discount or promotion toward paid subscriptions to make users satisfy the level of price. Also, it is crucial to think about extra services (e.g., recommendation service, multiscreen service) for practitioners to give the free users a higher expected value on subscription. Moreover, we found free users' mobile TV utilization will be one of the critical motivational factors in increasing the number of subscribers. Therefore, providing free content with good quantity and quality for free users may be a good strategy.

Ⅱ. Theoretical Background

2.1. Mobile Service Adoption and Use

Mobile service is defined as the ubiquitous mobile character of wireless devices that support electronic and Internet service transactions (Kleijnen et al., 2007). Mobile services are considered as new marketing applications, given that mobile usage has rapidly increased in recent years. The main reasons for this evolution of mobile services are the rapid development of mobile technology, continuing growth of e-commerce and the high penetration level of wireless devices (Kleijnen et al., 2004; Wang and Lin, 2012). Therefore, the most significant feature of mobile service is mobility: the ability to access services ubiquitously, on the move, and through wireless networks and various devices such as mobile phones (Coursaris and Hassanein, 2002; Lyytinen and Yoo, 2002). Kleinrock (1996) argued that 'anytime, anywhere' computing has become an indication of the nature of mobility, the independence of time and place. Lyytinen and Yoo (2002) also pointed out that in this mobile environment, "services will come to users whenever and wherever needed, through multiple devices at different sites, and on the move". Therefore, all services used as mobile devices may be referred to as mobile services.

In mobile services, service adoption research is part of the information system research area and can be divided into two research directions in information system research (Pedersen et al., 2003). Two research directions are traditional adoption research and research on computer-mediated communication. In particular, the computer-mediated communication studies on media selection and use relate to the study of the adoption of mobile Internet services. In adoption studies, a technology is an application or service rather than a device. Examples of these adoption targets include business software applications, entertainment applications, and personal productivity applications (Orlikowski et al., 2001). Adoption studies typically study the user's decision to adopt a particular technology or service at the individual level. Furthermore, adoption research goes beyond a simple analysis of the adoption process and seeks explanations of why a particular adoption behavior may be observed (Pedersen and Ling, 2003). Therefore, in this study, we focused on the motivational factors of why mobile TV subscription behavior was observed as part of adoption.

2.2. Mobile TV Service

Various changes in business and society are accelerating due to the increased usage of digital technologies. Mobile TV has been launched by integrating TV content with mobile devices without traditional wired cable service (Bentley et al., 2019). Therefore, TV has been changing from a traditional distribution method to a new one through digital technology (Kim and Park, 2008). With the transition from traditional TV to a new type of TV, the way viewers watch TV is also changing (Leung and Chen, 2017). According to the networks, broadcast standards, or diverse technical issues, there have been many types of mobile TV platforms. For instance, while the TV screen is directly displayed on a mobile device, many delivery methods exist, such as mobile phone networks and terrestrial stations (Shim, 2005).

The growing adoption of smartphones allows users to watch as much mobile TV, and its adoption popularity enables users to get up-to-date news and videos while traveling to and from work or for relaxation (Lin and Liu, 2011). Recent studies on mobile TV mostly conducted users' service adoption. The most important factor in the success of mobile TV is the consumer's intention to subscribe to a new service rather than the launch date or the size of the service providers (Kim et al., 2017). In the same vein, because new technologies or devices tend to be adopted quickly by relatively young users, Lee et al. (2011) investigated the factors affecting mobile TV adoption behaviors among the young generation. Besides, Zhou (2013) examined users' flow experience to study mobile TV immersion and adoption. Other researchers adopted perceived value, social cognitive, and motivation theories to explain users' service adoption and willingness to pay for mobile applications (Wang et al., 2013).

2.3. Intrinsic and Extrinsic Motivations

Individual motivation is necessary to explain behavioral differences and intensities (Humphreys et al., 1984). Since motivation is one of the critical predictors of individual behavior, it has been reviewed in a diverse research area. Many theories of motivation focus on goals or outcomes and the instrumentalities that lead to these desired outcomes (Bandura, 1977; Dweck, 1986). However, as Deci et al. (1991) pointed out the question of why specific results are desired, researchers began to address the issue of the energization of behavior. Accordingly, among the various motivation frameworks, previous researchers investigated that motivation is divided into two dimensions: intrinsic and extrinsic motivation (Deci, 1971; Deci et al., 1985; Ryan et al., 2000a; Vallerand et al., 1992). Based on the review of the related literature, individual behaviors can be seen as intrinsically or extrinsically motivated.

Self-determination theory (SDT) is related to human motivation and personality that concern people's inherent growth tendencies and innate psychological needs. It concerns the motivation behind choices people make without external influence and interference (Deci et al., 2002). SDT evolved from studies comparing the intrinsic and extrinsic motives, and key studies that led to the emergence of SDT included research on intrinsic motivation (Deci, 1971). Intrinsically motivated behaviors are those that engage for their own sake. Intrinsically motivated people act for the pleasure and satisfaction derived from performing certain behaviors (Deci, 1971; Vallerand, 1997).

On the other hand, extrinsic motivations are the goals of actions as a means to an end rather than their pleasure or satisfaction (Deci, 1975). They are behaviors that occur whenever an activity is conducted to attain some separable outcome. Since motivation is one of the most certain predictors of discovering

a variety of human behaviors, it has been widely used in diverse research areas in social science academia. The concept of motivation has been studied from several perspectives (Hull, 1943; Skinner, 1953). One aspect is that behavior can be intrinsically or extrinsically motivated. Ryan et al. (2000a) demonstrated that extrinsic motivation is a crucial construct that explains whenever an activity is done to attain some separable outcome. In other words, extrinsically motivated behaviors are not typically intriguing. The primary reason people initially perform such actions is that the behaviors are prompted, modeled, or valued by significant others to whom they feel attached or related (Ryan et al., 2000b). Accordingly, intrinsically motivated behaviors make up for the weak points of extrinsic motivation.

Ⅲ. Hypotheses Development

3.1. Intrinsic Motivation and Subscription Intention

The hedonic need will be the essential intrinsic motive for many mobile TV users. We define hedonic need as the degree to which a customer seeks interesting and enjoyable activities from mobile TV usage. Individuals seek to benefit from or enjoy the process of doing a particular behavior (Huang and Kuo, 2020). This motive is activated when a consumer behaves to experience a feeling of excitement or fun (Babin et al., 1994). In other words, consumers with hedonic motivations for mobile TV usage activities are more likely to be concerned with the entertainment and enjoyment aspects of the usage behavior. Moon et al. (2001) investigated the influence of perceived playfulness on the behavioral intention to use the World Wide Web context. Lin et al. (2005) also found that perceived playfulness was positively related to the intention to continue using a web portal.

Spatiotemporal convenience is ubiquitous, or nomadic computing refers to the movement of service platforms, people, technology, and so on. In the study, spatiotemporal convenience is defined as the degree to which a customer expects that he can use mobile TV service at any place and at any time. And the nomadic information environment is driven by three main drivers: mobility, digital convergence, and scale (Lyytinen et al., 2002). The mobility of a service platform is enabled and facilitated by new technologies. Mobile devices such as smartphones and tablet PCs are characterized by portability and connectivity, and users can flexibly watch TV programs (Kim et al., 2021). In our study, compared with traditional TV, mobile TV provides access to the service and enables us to watch TV or VODs independent of time and place. Likewise, consumer convenience in using a service is increasingly important for service providers and consumers. The convenience of mobile TV's portability is a crucial factor in using the subscription service. In addition, watching videos alone in a room and outdoors is becoming more common. Since consumers might no longer find a place and no longer wait to watch TV, spatiotemporal convenience should be the essential motive of mobile TV users. The advantage of mobility makes mobile TV users liberated and independent from time and place.

Self-efficacy is one of the components of the perceived behavioral control construct in the theory of planned behavior. We define self-efficacy as a customer's judgment of his capability or confidence to handle mobile TV service. Self-efficacy is defined by Bandura (1977) as people's judgments of their capabilities to organize and execute courses of action required to obtain designated types of performances. Further, he points out that self-efficacy refers to its dependence

on the difficulty of a particular task, which is measured by the amount of certainty about performing a given task. It is concerned not with the skills they have but with judgments of what they can do with whatever skills one possesses. User does not tend to modify something which they find challenging to adjust. This tendency implies that a user will rarely have the intention to subscribe to a mobile TV platform when they don't have enough confidence or capabilities to use it. Therefore, exploring users' confidence level in mobile TV manipulation will be necessary for predicting the users' paid subscriptions. According to the theory of planned behavior, the performance of a behavior is a joint function of intentions and perceived behavioral control. Perceived behavioral control plays an integral part in the theory of planned behavior in terms of its impact on intention and action (Ajzen, 1991). And the measures of perceived behavioral control must correspond to or be compatible with the behavior predicted. Likewise, Armitage et al. (2003) also argue that within the theory of planned behavior, perceived behavioral control is a determinant of behavioral intention. Therefore, we can propose that a user with a higher level of self-efficacy will have more intention of mobile TV service platform usage. As a result, we propose three intrinsic motivations that positively relate to mobile TV paid subscription intention. These arguments lead to hypotheses 1, 2, and 3:

H1: Hedonic need will have a positive influence on the subscription intention of mobile TV users.

H2: Spatiotemporal convenience will have a positive influence on the subscription intention of mobile TV users.

H3: Self-efficacy will have a positive influence on the subscription intention of mobile TV users.

3.2. Extrinsic Motivation and Subscription Intention

Fairness is a judgment of whether an outcome and the process to reach an outcome is reasonable and acceptable (Bolton et al., 2003). In the study, we define price fairness as the degree to which a customer evaluates a price as reasonable to accept. The cognitive aspect of this terminology indicates that price fairness involves comparing a price or procedure with a relevant standard, reference, or norm (Xia et al., 2004). Therefore, price fairness is a consumer's assessment and associated emotions of whether the difference (or lack of difference) between a seller's price and the price of a comparative other party is reasonable, acceptable, or justifiable (Xia et al., 2004). Likewise, perceived price fairness has been examined as a psychological factor that plays a vital role in consumers' reactions to prices (Etzioni, 2010). According to the previous literature, we can assume that consumers often are concerned with the fairness of a price. For example, when a price increases beyond their acceptance, they dislike it and are often unwilling to pay the price. Therefore, perceptions of price unfairness may lead to negative consequences for the service provider, including customers leaving the exchange relationship, spreading negative information, or engaging in other behaviors that damage the seller (Campbell, 1999). On the contrary, customers' perception of price fairness will lead to positive outcomes for service providers and customers. Since price fairness influences the judgment of whether the process to reach an outcome is acceptable, price fairness will affect customers' behavioral intentions. For such reasons, like extrinsic motivation, price fairness will positively influence the paid subscription intention of mobile TV users.

Subjective norm is the perceived social pressure

to perform or not to show a target behavior (Ajzen, 1991). We define subjective norm as the degree of a customer's perceived influence from important others to subscribe to mobile TV. As one of the extrinsic motivations, the subjective norm is the significant predictor of behavioral intention (Vries et al., 1988). In other words, the opinion and advice of friends, peers, teachers and parents affect individuals' behavioral intentions (Ng et al., 2020). An important third party induces social motivation, and this social motivation is counted as extrinsic motivation (Kaufmann, 2011). Wiener (1982) also argues that subjective norm is a function of a person's beliefs about what influential acquaintances think he should do. This becomes the crucial motivation to comply with the acquaintances. Consequently, it seems reasonable to posit that the subjective norm performs a role as one of the extrinsic motivations because motivation is also one of the most important predictors to find out behavioral intention. The recent research findings reveal that subjective norms positively affect the intention to play online games (Dahabiyeh et al., 2020). Mobile TV is also a relatively new service platform in that users can be influenced by innovative people or close friends. Thus, as extrinsic motivation, the subjective norm will affect the users' mobile TV paid subscription intention.

We define mobile TV utilization as the users' mobile TV usage level. Ouellette (1998) mentions that past behavior may contribute to particular intentions, and intentions guide behavior. In other words, past behavior is a predictor of future acts. Saga et al. (1994) also point out that when innovations are introduced, the most desirable outcome will be the routinization of the change.

To routinize an innovative or new service, users need to become familiar with the new service. In our research context, the level of mobile TV utilization may represent the level of routinization on mobile TV usage. Consequently, we can propose that a user with a higher level of mobile TV utilization will have more paid subscription intention in the mobile TV service platform, constructing hypotheses 4, 5, and 6:

H4: Price fairness will have a positive influence on the subscription intention of mobile TV users.

H5: Subjective norm will have a positive influence on the subscription intention of mobile TV users.

H6: Mobile TV utilization will have a positive influence on the subscription intention of mobile TV users.

3.3. Expected Value, Attitude, and Subscription Intention

Zeithaml (1998) defined value as what is good for a consumer. It is the consumer's overall assessment of the utility of a product based on perceptions. Researchers have argued that value orientations are predicted to affect a person's attitudes (Homer et al., 1988; Manfredo et al., 1997). Vaske et al. (1999) also demonstrated that differences in values had been shown to relate to significant differences in various attitudinal outcomes. Expected value is a subjective measure of the usefulness or satisfaction that results from consumption. In this study, we define expected value as the degree of anticipated benefit or satisfaction from mobile TV paid subscriptions. And attitude is defined as the degree of a customer's positive feelings about mobile TV paid subscription. In addition to intrinsic and extrinsic motivation, cognitive variables such as expected value and attitude were assumed to affect subscription intention. In this study, we thought that cognitive variables and motivations would affect intention, respectively, and we tried to report the results by dividing the expected

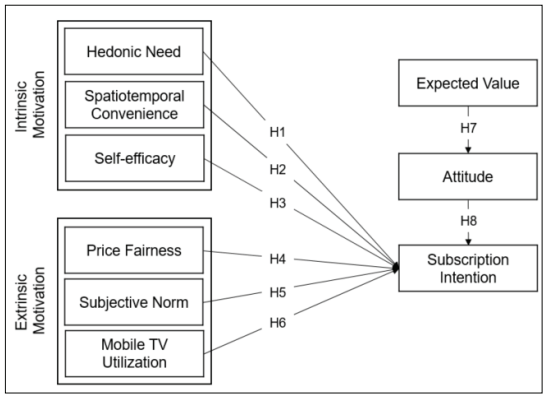
value from motivations. Value is one of the essential factors in deciding to use a new mobile service platform. Therefore, we suggest that expected value affects users' attitudes and thus influences their behavioral intention. This leads to hypothesis 7:

H7: Expected value will have a positive influence on the attitude of users toward mobile TV paid subscriptions

One's attitude toward target behavior determines one's behavioral intention. Homer et al. (1988) demonstrated that values influence attitudes, and, in turn, attitudes influence behaviors. Ajzen and Fishbein (1980) argued that behavioral intention is determined by an individual's attitude toward that behavior. Eagly et al. (1993) and Fishibein (1996) also mentioned that attitudes could be strong predictors of specific behaviors. Marketing researchers have analyzed the impact of human recognition on product preferences and buying decisions (Buettner, 2017). Likewise, users in a mobile TV platform will have a more favorable attitude when they expect higher value on paid subscriptions. Attitude is essential because there is always a positive or negative perception about the service when using the service. Therefore, we propose that a favorable attitude drives the user to have greater intention to subscribe to mobile TV service, leading to hypothesis 8:

H8: Attitude toward mobile TV paid subscription will have a positive influence on the subscription intention of mobile TV users.

The research model of the study is summarized in <Figure 1>.



<Figure 1> Research Model

Ⅳ. Methodology

We adopt the survey research methodology for collecting and analyzing the data. By adopting a survey methodology rather than other methods, we can verify high external validity since we expect to gain a more generalized mechanism of our research model on mobile TV.

4.1. Sample and Data Collection

We conducted a cross-sectional survey and collected data from mobile TV users in South Korea who have a mobile TV application on their mobile devices. And the survey sample in this study only consists of users who do not pay a subscription fee to examine free users' paid subscription intention toward mobile TV subscriptions. All necessary instructions were specified before survey items in our questionnaires. We entrusted the survey through a survey panel service company in South Korea. Through the panel service company, we collected data from the gender balance and the different age groups. The survey data was collected from January 6th, 2017, to February 17th, 2017. In total, 450 users

<Table 1> Hypotheses and Literature Review

Hypotheses	Literature Review
H1: Hedonic need will have a positive influence on the subscription intention of mobile TV users.	Individuals seek to benefit from or enjoy the process of doing a particular behavior (Huang and Kuo, 2020) This motive is activated when a consumer behaves to experience a feeling of excitement or fun (Babin et al., 1994) Perceived playfulness was positively related to the intention to continue using a web portal (Lin et al., 2005)
H2: Spatiotemporal convenience will have a positive influence on the subscription intention of mobile TV users.	Three main drivers drive a nomadic information environment: mobility, digital convergence, and scale (Lyytinen et al., 2002) Mobile devices such as smartphones and tablet PCs are characterized by portability and connectivity, and users can flexibly watch TV programs (Kim et al., 2021)
H3: Self-efficacy will have a positive influence on the subscription intention of mobile TV users.	Perceived behavioral control plays an integral part in the theory of planned behavior in terms of its impact on intention and action (Ajzen, 1991) Within the theory of planned behavior, perceived behavioral control is a determinant of behavioral intention (Armitage et al., 2003)
H4: Price fairness will have a positive influence on the subscription intention of mobile TV users.	Perceived price fairness has been examined as a psychological factor that plays a vital role in consumers' reactions to prices (Etzioni, 2010) Perceptions of price unfairness may lead to negative consequences for the service provider, including customers leaving the exchange relationship, spreading negative information, or engaging in other behaviors that damage the seller (Campbell, 1999)
H5: Subjective norm will have a positive influence on the subscription intention of mobile TV users.	Subjective norm is the significant predictor of behavioral intention (Vries et al., 1988) An important third party induces social motivation, and this social motivation is counted as extrinsic motivation (Kaufmann, 2011) Subjective norm is a function of a person's beliefs about what influential acquaintances think he should do, and this becomes the crucial motivation to comply with the acquaintances (Wiener, 1982)
H6: Mobile TV utilization will have a positive influence on the subscription intention of mobile TV users.	Past behavior may contribute to particular intentions, and behavior is guided by intentions (Ouellette, 1998) When innovations are introduced, the most desirable outcome will be the routinization of the change (Saga et al., 1994)
H7: Expected value will have a positive influence on the attitude of users toward mobile TV paid subscriptions	Value orientations are predicted to affect a person's attitudes (Homer et al., 1988; Manfredo et al., 1997). Differences in values have been shown to relate to significant differences in a variety of attitudinal outcomes (Vaske et al., 1999)
H8: Attitude toward mobile TV paid subscription will have a positive influence on the subscription intention of mobile TV users.	Values influence attitudes, and, in turn, attitudes influence behaviors (Homer et al. 1988) Behavioral intention is determined by an individual's attitude toward that behavior (Ajzen and Fishbein, 1980) Attitudes could be strong predictors of specific behaviors (Eagly et al., 1993; Fishibein, 1996)

participated and responded to this survey. Among the 450 participants, 244 users are male, and 206 users are female. Regarding the age of respondents, 54 in their 20s, 123 in their 30s, 198 in their 40s, and 75 in their 50s participated in the survey. To ensure the sample represents the population, we con-

firmed the data were collected from various ages and the proportion of men and women is similar. <Table 2> shows the demographic information about mobile TV users who participated in this survey. Furthermore, we took several steps to address the issue of common method bias. First, we collected data at two points to prevent common method bias. And Podsakoff et al. (2012) argue that this is the case if participants cannot provide accurate responses. Thus, we kept the questionnaires short and straightforward that were not immediately relevant to this study. According to the survey company, each survey only took about ten minutes on average. The survey company also confirmed that our questionnaires were clear and easy to answer. Our high completion rates indicated that answering our questions was not difficult for participants.

4.2. Measurement

Most measurement items were adopted from past studies, and we modified the wording to reflect our mobile TV research context. We conducted a closed-ended survey asking participants to rate the parameters on a 7-point Likert-type scale with 1 = low and 7 = high. Since the survey was conducted in Korea, the translation process was administered for a Korean version. The process confirmed the equivalence in the language of the survey questionnaires, so it should be compared and synchronized to the original English version. According to the study of Miracle and Bang (2002), a bilingual speaker translated the original English questionnaires into Korean, and a second bilingual speaker translated the Korean version back into English. The translation process continued until both survey questionnaires were deemed to be equivalent. In this study, all measurements are reflective. Since the square root of the AVE of the reflective construct is greater than the correlation of other constructs in the model, discriminability was also secured. Also, reflective measurement model assessment involves examining the indicator loadings. Loadings above 0.708 are recommended, and all loadings in this study are above 0.800. Composite reliability is also used to evaluate reflective measurements, and the higher values generally indicate higher levels of reliability. For example, reliability values between 0.60 and 0.70 are considered "acceptable in exploratory research," and values between 0.70 and 0.90 range from "satisfactory to good (Diamantopoulos et al., 2012). The composite reliability values all exceeded 0.900.

For the expected value, we adopted the items used in the study of Mallat et al. (2009), Rust et al. (2004), and Cronin et al. (2000) (e.g., I will be satisfied with the diversity of channel selection). For attitude, subscription intention, and subjective norm, items were employed from Bock et al. (2005) (e.g., Using the service is good). For hedonic need, we used the measure developed by Bruggen et al. (2011) (e.g., It is fun to do). For spatiotemporal convenience, we adopted the study of Mallat et al. (2009) (e.g., I can use this service any time I want). For price fairness, the four

<Table 2> Demographic Profile of the Respondents

Item	Option	Count	%
Gender	Male	244	54.2%
	Female	206	45.8%
Age	20s	54	12.0%
	30s	123	27.3%
	40s	198	44.0%
	50s	75	16.7%
Period of service use (in months)	< 1	114	25.3%
	1~3	76	17.0%
	4~6	55	12.2%
	7~12	41	9.1%
	> 12	164	36.4%
Total		450	100%

items were from Grewal et al. (2004) (e.g., The price of the service is appropriate relative to its performance). For self-efficacy, we used the study of Hau et al. (2011) (eq. If I wanted to, I would be able to handle the Mobile TV system). And for mobile TV utilization, we used the study of Van et al. (2003) (e.g., How often do you access a mobile TV?). Operational definitions and measurement items of all variables are presented in <Table 3> and <Appendix>, respectively.

4.3. Analysis Methodology

This study used the PLS via Smart PLS version 2.0 to test our research model and hypotheses. PLS was developed as a structural modeling analysis method, and many researchers have used it in diverse academic areas (Chin, 2010; Henseler and Fassott, 2010). PLS enables researchers to examine complex, interrelated dependence relationships and incorporate the effects of measurement error on structural coefficients at the same time (Lee et al., 2011). PLS is mainly for exploratory and prediction-oriented studies and does not require a multivariate normal distribution (Fornell and Larcker, 1981). The primary reason for using PLS is the ability to simultaneously calculate path coefficient estimations of antecedents of multiple dependent variables and mediation effects. PLS has been employed to examine complex electronic commerce research models (Huang and Liao, 2015; Walia et al., 2016). It is suitable to use our research because this study is an exploratory attempt to examine the mobile-related construct and different motivational factors in the mobile TV context.

Ⅴ. Results

5.1. Measurement Model

The internal reliability was checked using Cronbach's alpha. All of Cronbach's alpha values

<Table 3> Operational Definitions of Constructs

Construct	Operational Definition	Indicator*
Hedonic Need	The degree to which a customer seeks interesting and enjoyable activities from mobile TV usage	4(4) items, 7 Likert Scale
Spatiotemporal Convenience	The degree to which a customer expects that he can use mobile TV service at any place and at any time	4(4) items, 7 Likert Scale
Self-efficacy	A customer's judgment of his capability or confidence to handle mobile TV service	4(4) items, 7 Likert Scale
Price Fairness	The degree to which a customer evaluates a price as reasonable to accept	4(4) items, 7 Likert Scale
Spatiotemporal Convenience	The degree to which a customer expects that he can use mobile TV service at any place and at any time	4(4) items, 7 Likert Scale
Subjective Norm	The degree of a customer's perceived influence from important others to subscribe to mobile TV	4(4) items, 7 Likert Scale
Expected Value	The degree of anticipated benefit or satisfaction from mobile TV paid subscription	5(5) items, 7 Likert Scale
Attitude	The degree of a customer's positive feelings about mobile TV paid subscription.	5(5) items, 7 Likert Scale
Subscription Intention	The degree to which a customer believes that he will subscribe to mobile TV	5(5) items, 7 Likert Scale

* Final item numbers (Initial item numbers)

showed satisfactory levels ranging from 0.779 to 0.956. Convergent validity and discriminant validity were assessed to validate the measurement model. For convergent validity tests, the composite reliability (CR) ranged from 0.900 to 0.968. The average variance extracted (AVE) ranged from 0.766 to 0.884, and all item loadings ranged from 0.691 to 0.949. CR values should be greater than 0.7. AVE values should exceed 0.5 (Chin, 1998; Fornell et al., 1981). All item loading should be greater than 0.6 (Hair et al., 2010). And t-values (ranging from 17.36 to 179.04) should be greater than 1.96 (Gefen et al., 2005). <Table 4> shows that all CR, AVE, and loadings of our research model satisfied the recommended threshold values.

We checked both factor loadings and cross-loadings, and each measurement item loaded higher than on its assigned construct. For the discriminant validity verification, two requirements are satisfied. First, cross-loadings should be lower than the factor loadings of the original construct (Hair et al., 2010). Second, the square root of all AVE should be higher than all inter-correlations among constructs (Fornell et al., 1981). <Table 5> shows that all square root of AVE is higher than all inter-correlations. In addition to correlation analysis, we also checked multicollinearity. The variance inflation factor (VIF) values ranged from 1.217 to 3.141, which indicated that multicollinearity was not a problem for the proposed model.

While CB-SEM strongly relies on the concept of goodness of fit, this is much less the case with PLS-SEM (Hair et al., 2019). To verify model fit in the case of an external model for reflective items,

<Table 4> Reliability and Convergent Validity

Construct	Mean (S.D.)	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)	Items*	Loadings	t-value
Expected Value	4.647 (1.248)	0.923	0.942	0.766	EVal(5)	0.809~0.908	36.256~87.516
Self-efficacy	4.698 (1.324)	0.917	0.941	0.799	SelE(4)	0.853~0.931	33.067~102.783
Attitude	4.097 (1.186)	0.944	0.957	0.816	Att(5)	0.889~0.916	69.416~105.332
Price Fairness	3.557 (1.169)	0.956	0.968	0.884	PriF(4)	0.930~0.949	120.644~179.040
Spatiotemporal Convenience	4.783 (1.278)	0.908	0.935	0.783	STC(4)	0.848~0.913	41.694~77.126
Hedonic Need	4.479 (1.236)	0.954	0.966	0.878	HedN(4)	0.922~0.948	94.079~166.960
Subjective Norm	3.732 (1.210)	0.895	0.929	0.769	SubN(4)	0.691~0.938	17.361~155.885
Subscription Intention	3.520 (1.405)	0.953	0.964	0.843	Inten(5)	0.893~0.939	61.756~118.898
Mobile TV Utilization	2.130 (0.937)	0.779	0.900	0.819	MobTV(2)	0.897~0.912	59.904~59.961

Note: * Name of items (Item numbers)

<Table 5> Square root of AVE and Correlation of Variables

	Attitude	Expected Value	Hedonic Need	Subscription Intention	Mobile TV Utilization	Price Fairness	Spatiotemporal Convenience	Self-efficacy	Subjective Norm
1. Attitude	**0.903**								
2. Expected Value	0.633	**0.875**							
3. Hedonic Need	0.743	0.614	**0.937**						
4. Subscription Intention	0.616	0.372	0.536	**0.918**					
5. Mobile TV Utilization	0.354	0.112	0.320	0.446	**0.905**				
6. Price Fairness	0.673	0.506	0.570	0.660	0.300	**0.940**			
7. Spatiotemporal Convenience	0.653	0.647	0.736	0.406	0.220	0.479	**0.885**		
8. Self-efficacy	0.541	0.655	0.599	0.279	0.128	0.393	0.659	**0.894**	
9. Subjective Norm	0.598	0.356	0.537	0.747	0.373	0.691	0.450	0.328	**0.877**

Note: The diagonal values are the square root of AVE. The off-diagonal values are the inter-correlations among constructs.

the reliability, convergent validity, and discriminant validity items should be checked. In evaluating the internal model, the path coefficient of path analysis and the R-square should be checked (Hair et al., 2019). Therefore, we have tested Cronbach's alpha, composite reliability, loadings, t-values, AVE, path coefficients, R squares and so on. And the values all met the criteria.

To check the robustness of our research model, a bootstrapping technique and KMO verification were performed. Survey data is often not normally distributed, and to secure robustness through significance verification of path coefficients, a bootstrapping technique was applied to solve the problem (Davidson and Hinkley, 1997; Kline, 2005). In addition, KMO (Kaiser-Meyer-Olkin) verification was performed for the robustness check to determine whether it was suitable for factor analysis. The higher the partial correlation, the lower the KMO value; the lower the partial correlation, the higher the KMO value. Therefore, the larger the KMO value, the more appropriate the data for the hypotheses test can be judged. KMO value should be higher than 0.7, and the KMO value in this study showed 0.953, which is very high (Kaiser, 1974).

5.2. Structural Model

The proposed research hypotheses were tested using the structural equation modeling (SEM) method with the PLS technique. The bootstrap resampling method was used with a total of 500 resamples to determine the significance of the hypotheses among the constructs. The research hypotheses were tested based on the significance of the path, and the results showed the relationships between constructs. The results illustrate that five of the eight hypotheses in our research model were supported by the survey data of 450 mobile TV users in South Korea.

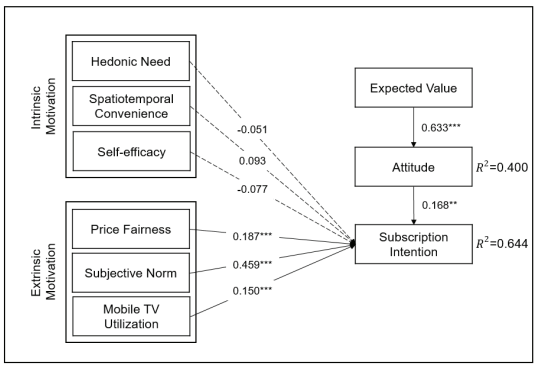
Intrinsic motivational factors, hedonic need, spatiotemporal convenience, and self-efficacy were insignificant; hypotheses 1, 2 and 3 were not supported. Three extrinsic motivational factors, price fairness, subjective norm and mobile TV utilization, showed a substantial

influence on paid subscription intention and supported hypotheses 4, 5 and 6. Among the motivations, the subjective norm has the most potent explanatory power in explaining mobile TV users' paid subscription intention. Users may tend to listen to their friends when deciding whether to pay. Expected value toward paid subscription significantly influenced attitude toward paid subscription; supported hypothesis 7. Attitude on paid subscriptions substantially impacted mobile TV paid subscription intention; supported hypothesis 8. The results imply that in the mobile context, users' values and attitudes are critical for driving pay subscriptions, as we expected. The hypotheses test results of the research model are summarized in <Figure 2> and <Table 6>.

Ⅵ. Discussions

6.1. Summary of Findings

This study aims to clarify how expected value, individual motivations, and mobile TV usage behaviors influence mobile TV users' paid subscription intention. Our study focused on mobile service adoption, especially in the paid mobile TV subscription context. Existing adoption studies examined the user's decision to adopt a particular technology or service and further analyzed the adoption processes and explanations of why the adoption was observed. To figure out why a particular behavior has been observed, our study investigated the importance of motivational factors (i.e., intrinsic and extrinsic motivations) and how these motivations affect users' subscription intention. This paper, in addition, explores how mobile TV users' expected value of subscription affects their attitude toward subscription and also finds out the effect of the attitude on subscription intention. Finally, this study investigates the mechanism of why free users subscribe to a paid subscription.



* p ≤ 0.1, ** p ≤ 0.05, *** p ≤ 0.01

<Figure 2> Results of Hypotheses Test

As an antecedent, expected value strongly influenced attitude towards paid subscriptions, and the attitude also had a significant impact on paid subscription intention. More importantly, extrinsic motivations such as price fairness, subjective norm and mobile TV utilization considerably influenced paid subscription intention. Extrinsic Motivations had the same effect on the subscription model of this study

<Table 6> Summary of hypothesis testing results

Hypotheses	Relevant Relationship	Path coefficients
H1	Hedonic Need → Subscription Intention	-0.051
H2	Spatiotemporal Convenience → Subscription Intention	0.093
H3	Self-efficacy → Subscription Intention	-0.077
H4	Price Fairness → Subscription Intention	0.187***
H5	Subjective Norm → Subscription Intention	0.459***
H6	Mobile TV Utilization → Subscription Intention	0.150***
H7	Expected Value → Attitude	0.633***
H8	Attitude → Subscription Intention	0.168**

as in the results of other existing researchers. For instance, as Etzioni (2010) argued, perceived price fairness has been examined as a psychological factor that plays a vital role. Price fairness significantly impacted consumers' Mobile TV subscription intention in this study. Furthermore, the subjective norm had the most substantial explanatory power in explaining mobile TV users' paid subscription intention among the motivational factors. The result implied that users tend to listen to their friends or acquaintances when deciding whether to subscribe. Also, as we hypothesized, the level of mobile usage had a significant effect on paid subscription intention. It seems that users who use mobile TV more become loyal users, making them willing to pay for a subscription. Furthermore, we confirmed that expected value toward paid subscriptions impacted attitude toward paid subscriptions. And we also verified that attitude toward paid subscriptions significantly influenced mobile TV paid subscription intention.

Three intrinsic motivations, hedonic need, spatio-temporal convenience and self-efficacy, did not significantly impact paid subscription intention. Although not significant, the influence of hedonic need on intention was negative. The Mobile TV subscription is more likely to be seen as an act of preferring to be alone at home or taking a break while watching TV alone. People with a strong hedonic need may tend to spend time outside with friends rather than watching TV at home. Also, it can be interpreted that subscriptions for long-term viewing are not affected by hedonic needs, which can be judged as short-term motivations. Existing studies (Babin et al., 1994; Huang and Kuo, 2020) have pointed out that hedonic need affects consumer behavior. It has also been argued that hedonic need has an important influence on the use of Internet devices or the Internet. (Bruner et al., 2005; Moon et al., 2001). Most of them are studies on adoption, but this study was a study on whether to pay additional money and subscribe to the state of adoption. Therefore, this study does not overturn the previous results, but it was found through this study that intrinsic motivation had no effect in the case of paid mobile TV subscriptions.

In addition, contrary to our expectations, spatio-temporal convenience did not affect the mobile TV subscription intention. It can be seen as a discovery that the portability or mobility of mobile devices did not affect mobile TV subscriptions. Previous studies have dealt with the portability and convenience of mobile devices, but no research has been conducted on how to affect paid subscriptions (Kim et al., 2021; Lyytinen et al., 2002). This result can be interpreted as that mobile devices are not only used intensively on the move or outside. Many users who pay for subscriptions can be expected to watch more mobile TV when they rest at home or before going to bed than when they are outside or on the move.

Self-efficacy, one of the intrinsic motivations, does not significantly affect paid subscription intention. In this study, self-efficacy is a customer's judgment of his capability or confidence to handle mobile TV service (Bandura, 1977). This result implies that users' judgment of their capability or confidence to handle mobile TV service does not strengthen paid subscription intention. It is not overturning the existing theory, but we might think that handling mobile devices doesn't give you confidence in yourself anymore because the users already have considerably used mobile devices and Mobile TV apps. In this research model, it can be confirmed that self-efficacy had no effect because the data has been measured in a situation where users are already familiar with mobile devices. Therefore, in the context of paid subscriptions, for users who have already adopted

Mobile TV, Self-efficacy did not impact subscription intention. Mobile TV users may experience the use of the service since other mobile applications have a similar user interface (UI) and user experience (UX) to mobile TV applications. Furthermore, mobile TV is not complicated to use, but simply watching TV. Therefore, people with high self-efficacy can be interpreted as avoiding simple and static long-term subscriptions.

6.2. Theoretical Implications

The result of this study suggests several implications for the literature. First, this study extends and integrates prior theories and research on mobile TV adoption and usage. Adoption studies typically go beyond a simple analysis of the adoption process and seek explanations of why a particular adoption behavior may be observed (Pedersen and Ling, 2003). Orlikowski pointed out that the study on media selection and use relates to the study of the adoption of mobile Internet services. This study conducted a study related to media adoption by extending the study to Mobile TV, which is one of the mobile Internet services. Jung et al. (2009) studied the users' behavioral intention to use the mobile TV but did not include attitude and expected value. Choi et al. (2012) investigated the users' behavioral attitude in using mobile TV; however, it did not add expected value. This study extends the TPB by applying users' expected value as an antecedent to attitude. And this study integrates motivational theories on the TPB framework to determine the factors affecting paid subscription intention.

Second, this study facilitates exploring which motivations lead to paid subscription intention. Previous research on individual motivations pointed out that motivation is one of the critical predictors of individual behavior (Bandura, 1977; Dweck, 1986; Humphreys et al., 1984). Although individual motivations are closely related to the acceptance or payment of a service, there is a lack of studies clarifying the relationship between motivations and mobile TV paid subscriptions. Contrary to prior expectations, the finding of this study suggests that only three extrinsic motivations (price fairness, subjective norm and mobile TV utilization) seem to affect paid subscription intention. But, the three intrinsic motivations (hedonic need, spatiotemporal convenience and self-efficacy) are not related to paid subscription intention.

Third, this study addresses mobile TV utilization in a paid subscription model as a new extrinsic motivation. Previous research on mobile TV did not address mobile TV utilization as an antecedent to adoption behaviors (Choi et al., 2012; Jung et al., 2009; Lee et al., 2011; Wang et al., 2013, Wong et al., 2016; Zhou 2013). Our study is the first to introduce the level of mobile TV utilization to check its effect on the behavioral intention of mobile TV paid subscriptions. This approach deepens our understanding of the behavioral dynamics in the mobile context.

6.3. Managerial Implications

This study has several practical implications. First, mobile TV service providers must satisfy users' expected values, such as the diversity of content, recommendation service, and multiscreen usability, to make them favorable towards paid subscriptions. Since the paid subscription intention is highly related to the attitude, satisfying users' expected value will promote their acceptance of paid subscription service

Second, this study suggests service providers focus more on making free users access more frequently and watch longer before paying for the subscription. Since mobile TV utilization has directly affected paid subscriptions, free users' mobile TV utilization will

be a critical motivational factor to increase subscribers.

Third, this study reminds service providers of the importance of user motivation. Since only extrinsic motivations (price fairness, subjective norm and mobile TV utilization) are associated with the paid subscription intention, practitioners should consider an effective promotion strategy. For example, they may consider a discount or promotion toward paid subscriptions to make users satisfy the level of price. Also, service providers may consider providing gifts or bonus points when subscribers recommend the mobile TV service to their acquaintances. Besides, service providers may consider the "buy one, get one" promotion. For example, when a subscriber buys a VOD, the service provider may provide one free VOD for a subscriber's recommended friend since the subjective norm is essential to lead a subscription intention.

6.4. Future Research Directions

This study has several suggestions for future research. First, since this study is based on a cross-sectional survey methodology, all the data was collected simultaneously. It may not clarify the dynamic cognitive stream of intention for mobile TV paid subscriptions over time. A longitudinal approach would be promising for future research. Second, this study has a limitation on the generalizability of the findings. Although 450 survey data were collected from the representative mobile TV services in Korea, data collection was limited to the top-rated Korean mobile TV users. Since all samples are collected only in Korea with Korean people, the results of this study may have sampling bias and have limitations for generalizing in other cultural environments. Therefore, future studies may consider clarifying our findings in different cultural settings. Third, this study could not collect and analyze the users' transaction data for paid subscriptions. Since users' self-reports measured paid subscription intention, the result of this study can be vulnerable to assess the paid subscription behavior. Future researchers should consider applying transaction data to users' paid subscriptions.

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<Appendix> Measurement Items of Research Construct

Construct	Measurement Items	Related reference
Expected Value	I will be satisfied with the multiscreen usability I will be satisfied with the diversity of channel selection I will be satisfied with the diversity of VOD selection I can use recommendation service It will be easy to search	Mallat et al. (2009) Rust et al. (2004) Cronin et al. (2000)
Attitude	Using the service (Purchasing and watching a VOD) is good Using the service is (Purchasing and watching a VOD) an enjoyable experience Using the service is (Purchasing and watching a VOD) valuable to me Using the service is (Purchasing and watching a VOD) a wise move	Bock et al. (2005)
Subscription Intention	I will use the service soon I intend to use the service more frequently in the future I will use the service wherever I go I will use the service for a long time	Bock et al. (2005)
Hedonic Need	It is fun to do I find participating in this service appealing I think that participating is quite enjoyable I think it is pleasurable	Bruggen et al. (2011)
Spatiotemporal Convenience	I can use this service any time I want I can use this service any place I want Using the service reduces the time required Using the service is convenient because the mobile device is usually with me	Mallat et al. (2009)
Subjective Norm	Innovative people around me think that I should subscribe to (purchase) the service My colleagues think that I should subscribe to (purchase) the service My close friends think that I should subscribe to (purchase) the service	Bock et al. (2005)
Price Fairness	The price of the service is fair The price of the service is appropriate relative to its performance The price of the service meets my expectations The price of the service is clearly understandable	Grewal et al. (2004)
Self-efficacy	If I wanted to, I would be able to handle the Mobile TV service system. If I wanted to, I am confident that I would be able to handle the mobile TV service system I am sure that I can handle the mobile TV service system I have enough expertise necessary to handle the mobile TV service system	Hau et al. (2011)
Mobile TV Utilization	How often do you access mobile TV? How long do you watch mobile TV in a day?	Developed by authors

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