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How important are real-time communications in TV Watching? A case of AfreecaTV in Korea

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How important are real-time communications in TV Watching? A case of AfreecaTV in Korea

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Abstract

Today, Internet and digital communication technologies are reshaping media industry worldwide. New interactive TV service is taking off even though it is not a serious threat yet to old unidirectional broadcasting. The most powerful online live streaming TV service in Korea is AfreecaTV, which enables synchronous communication with other audiences and content providers, called broadcasting jockeys (BJs). This study examines how important real-time communications are in watching TV by surveying viewers of Afreeca TV. It is found that the motives for information/audience interaction, sexual curiosity, and BJ interaction are positively correlated with audience activity, which is in turn positively correlated with audience satisfaction. The motive for entertainment/habit-pastime, however, turns out to be negatively correlated with audience activity, but directly correlated with audience satisfaction. One of the most important findings of this study is that real-time interaction is an important factor that directly and indirectly influences watching online live video streaming service. This implies that interaction with other audiences and BJs will play a key role in the evolution process of future TV service.

Key words: Online Live Video Streaming; Interaction; Audience Satisfaction; Real-time Communication; Viewing Motives; AfreecaTV

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1. Introduction

It is easy to find people watching videos on the subway or the bus and in the café with their smart devices in Korea. They watch video on demands and real-time broadcasting programs, play games, and watch and participate in interactive broadcasting service. As wireless Internet capacity grows rapidly, people's multimedia consumption behavior changes from passive watching to active or interactive watching, and their location of watching from a few places like home or workplaces to every places including buses and subways (Richard, 2006; Burgess & Green 2013). The Internet has become a major alternative distribution channel for multimedia content including live TV shows (Ferguson & Perse, 2000).

The Internet is fundamentally different from terrestrial broadcasting in that it enables viewers not just to watch multimedia programs but also to communicate, while watching, with other viewers and broadcasting jockeys. The importance of interactive nature of new media has been studied and discussed in previous studies (Napoli, 2008; Park, 2003; Walther, Carr, Choi, DeAndrea, Kim, Tong & Heide, 2010). However, previous studies have not been based on a genuinely interactive broadcasting service because it is only recently that interactive broadcasting services have gained a considerable customer base. Even though there have been interactions among YouTube users in the forms of comments, recommendations and reviews, they were mostly asynchronous interactions. Recently, online live video streaming services, which offer synchronous interactions among users, are appearing as a successful business model (Kaytoue, Silvia, Cerf, Meira Jr and Raissi, 2012). One of the most well-known online live video streaming service in US is TwitchTV, which functions as a personal broadcasting platform for game content. AfreecaTV, a leading Korean online personal broadcasting service, in contrast, provides various content services covering such genres as sports, game, and shows.

AfreecaTV stands for All FREE broadCAsting TV service provided in Korea on the Internet. The broadcasters of AfreecaTV are called BJs (broadcasting jockeys), who provide linear and nonlinear personal broadcasting services on the Internet. After opening channels, BJs broadcast his or her multimedia content such as videos, shows, and sports game and online game comments. Audiences, after connecting to AfreecaTV platform through the wired or wireless Internet, choose a channel to watch shows or games provided by a BJ with his or her own narrative comments.

Audiences on the AfreecaTV platform are not just passively receiving multimedia content from BJs but also actively interacting with BJs and other audiences while watching streaming multimedia content. Interactions occur on the platform called 'AfreecaTV player,' and AfreecaTV offers users additional options to increase profit. Audiences can purchase cash items such as 'star balloon', 'sticker', 'quick view', and 'multi-view'. Star balloons and stickers are used as gifts for BJs, which later can be converted into cash by BJs. Quick views and multi views are sold for enhancing audiences' watching environment; quick view skips advertisement before getting into a channel and multi view allows audiences to watch multiple channels concurrently. Also, as a result of interaction between BJ and audiences, BJs' real-time rankings are updated instantaneously by the number of audience recommendations, peak concurrent viewers, and the index of cash items. The daily average number of concurrent viewers of AfreecaTV rose from 200,000 in 2011 to 380,000 in 2013, which is more than a third of that of cable TV audiences (KOCCA, 2013). Also, in 2013, the peak concurrent viewers reached 770,000 on a day. In addition, the average number of unique visitors to AfreecaTV per day in 2013 was about 3.3 million (the population of South Korea was about 50 million).

There have been several previous studies about AfreecaTV but most of the studies were related to technologies or possible business models. In contrast to previous studies, this paper tries to examine the importance of

real-time communication between viewers and BJs by investigating empirically the effects of interactive feature of AfreecaTV on audience satisfaction. This research conducted a survey to collect data from AfreecaTV viewers and set up a model to test correlation between viewer satisfaction and the theoretical determinants (latent variables) of viewer satisfaction. For traditional broadcasting service, research papers on the determinants of viewer satisfaction are many, but for new media like AfreecaTV, empirical studies are scant simply because there have been no successful cases.

As a brief final outcome for structural equation model in this paper, there were several interesting results. Firstly, there were two tied-up viewing motives after exploratory factor analysis; information/ audience interaction and entertainment/ habit-pastime. Secondly, audience activity had positive and significant influence on audience satisfaction, as expected. While most of all viewing motives had positive effect on both audience activity and audience satisfaction directly and indirectly, entertainment/ past-time had negative effect on audience activity. Also, sexual curiosity had no relationship with audience satisfaction.

The structure of this paper is as follows. Section 2 reviews briefly the previous studies on the determinants of viewer satisfaction and section3 introduces the research model and hypotheses of this paper. Section4 explains the measurements of latent variables and the descriptive statics of survey data, and section 5 reports the outcomes of analyses. Section 6 discuss implications of the results, and section 7 concludes the paper with a brief summary and a statement on the limitations of the paper.

2. Literature Review

This section mainly focuses on audience satisfaction, viewing motives, audience activity, and interaction that compose the analytical model of this paper. Ever since uses and gratifications begin to focus on audience needs

that are satisfied by using mass media (Katz, Blumler & Gurevitch, 1973), the study of use and gratification has been developed and changed. Television news satisfaction was found to be explained by gratification held from news exposure (Palmgreen & Raybourn, 1985) and media selection was found to be influenced by intentionality of audience (Rubin, 1994). For example, it can be said that books and news tend to satisfy information needs which make audience active while television satisfies entertainment needs with less activity.

Naturally, this is linked with audience activity and viewing motives. Because gratifications are motivated by uses, degree of audience intention and actual activities should be estimated. There are some common agreements in case of viewing motives. In terms of traditional TV viewing motives, Perse and Rubin (1988) gives several factors which are exciting entertainment, pass time, voyeurism, escapist relaxation, information and social utility. These factors can be also adopted with a little modification to reality television including social learning, exciting entertainment, habit-pastime, voyeurism, relax-escape (Godlewski & Perse, 2010). In Korea, widely used viewing motives are almost the same; entertainment, sexual curiosity, information, pastime and avoidance of loneliness (Kim, 2005; Hwang & Park, 2007).

Most of studies that included audience activity used the former and original reference which is set up by Levy and Windahl (1984). Levy and Windahl classified types of audience activity by communication sequence and audience orientation; selective exposure-seeking, decoding and interpreting and social utilities. Firstly, selective exposure-seeking is selective activity before exposure. Secondly, decoding and interpreting are involved activity during exposure. Lastly, social utilities are using activity after exposure.

When it comes to interactivity, however, it is difficult to find one common sense. Because the term 'interactivity' itself has numerous concepts and definitions according to different research fields from biochemistry,

machine communications to media art, sociology and so on. In communication perspective, 'interactivity' can be divided into three aspects (Van Dijk & De Vos, 2001); Human-human interaction, Human-medium-human interaction and human-medium interaction. Human-human interaction can be also explained as "the relationship between two or more people who, in a given situation, mutually adapt their behavior and action to each other" (Jensen, 1998). Meanwhile, mediated interaction is usually used in HCI (Human Computer Interaction) area. Fundamentally, Rafaeli (1988) considered both human interaction and computer mediated communication from the beginning, which consists of two-way communication, responsive communication and interactive communication.

Later, Kioussis (2002) broadened the range of interactivity by integrating activity, property and perception of the user. Kioussis insists that the structure of a medium, the context of communication settings and the perception of users should be taken into account at the same time in terms of hybrid system led by media convergence. In order to explore interpersonal aspects of mediated communication, the new mass communications medium, the Internet, began to integrate into model as Ruggiero (2000) insisted.

Richards (2006) regarded interactivity as an activity and classified audiences into three groups according to activeness; consumer, processor and generator. Consumer responses to contents and interacts, however, it is relatively passive position. Audience who can switch from information receiver into transmitter is called processor, also participating in responses of other audience or system. When audience eventually becomes a generator who can use resources and create contents, it is possible to make other people become consumer or processor.

Recently, Cesar and Geerts (2011) suggest some interesting classification of new media. One refers to synchronous communications between audience in different location and the other is asynchronous communications in the form of content recommendation and sharing. An asynchronous

communication can be widely seen these days including video sharing based on SNSs and YouTube. On the other hand, synchronous communication is relatively recent development which allows people to interact in real-time. It is also known as online live video streaming services and contains real-time chatting functions while watching the same transferred screen at the same time. As such audience can participate more actively. However, although new media allows audiences to participate more actively, it is only a small proportion of all audiences who participates in interaction.

Different from previous researches, in perspective of marketing, satisfaction is highly related to quality and it later leads to higher loyalty (Olsen, 2002). The study will combine influences of qualities with original audience activity and satisfaction model. Further explanation will be stated in next section.

3. Research Design

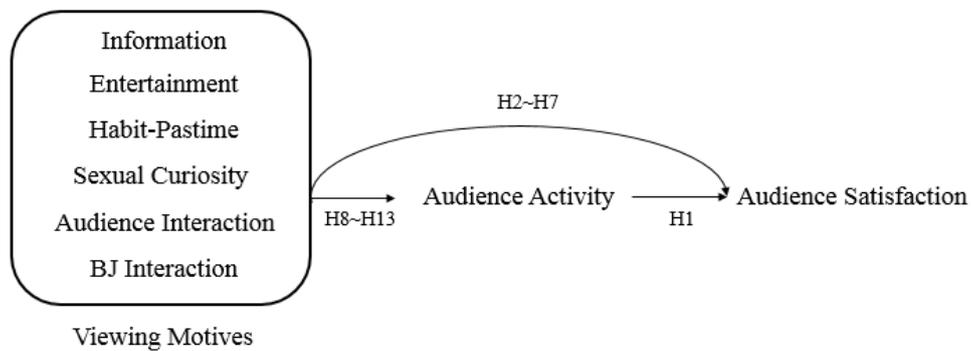
Previous researches sought relationship among audience satisfaction, audience activity, viewing motives and some psychological aspects such as interaction, presence and so on by using hierarchical regression. Even though there are some reasonable support that higher viewing motives affect audience activity, however, it depends on types of motivation (Perse, 1988). Also, parasocial interaction (PSI), which refers to audiences' emotional engagement with mediated character as if he/she is directly interacting with them affects audience satisfaction (Kim & Rubin 1997; Perse et al., 1988, Godlewski et al., 2010) is not the case in direct interaction during real-time broadcasting. This is because the internet network allows synchronous interactions that expands opportunities of communications (Ruggerio, 2000).

In this study, interaction will be included in the viewing motives; BJ interaction and audience interaction. BJ interaction is real-time interaction between BJs and audiences which is focused on BJ's effort on encouraging

audiences' participation. On the other hand, audience interaction is interaction with other audiences in the perspective of audiences themselves.

The paper uses survey data and a structural equation model to test what are the influential determinants of audience satisfaction in online live streaming service. The structural equation model includes audience satisfaction, audience activity and viewing motives in which BJ interaction and audience interaction are included. The brief structure model is designed as following <Figure 1>.

Figure 1. Brief Structure Model



A. Audience activity

According to Levy et al. (1984), audience activity can be classified into three categories; before, during and after exposure. Audience activity before exposure refers to selective seeking, during exposure includes decoding and interpreting activities and after exposure means social utilities. The categories were divided more specifically by Perse et al. (1988). In this paper, the classification used by former researchers is used; before, during and after exposure.

According to Perse et al. (1988) and Godlewski et al. (2010), higher satisfaction is derived from higher viewing motives and audience activity. However, it is not always true according to Baek, Moon and Gi (2008) that there is no relationship between audience activity and satisfaction as an

environment of watching TV is shifted from analog to digital. Here, the following hypothesis is proposed as <Figure 1>.

H1. Audience activity is positively related to audience satisfaction.

B. Viewing motives

According to Perse et al. (1988), all viewing motives were significantly related to explain program satisfaction. In 2010, Godlewski et al. regressed viewing motives to post-exposure online activity and reality program viewing satisfaction. Hierarchical multiple regression was used and it turned out that social learning and voyeurism were significantly positively related to online activity. In addition to the basic previous viewing motives, the study includes ‘audience interaction’ and ‘BJ interaction’. Detail explanation will be found in next section. Therefore, all viewing motives are expected to be positively related to both audience activity and audience satisfaction. The following hypotheses are proposed with regard to viewing motives as depicted in <Figure 1>.

H2. Information is positively related to audience activity.

H3. Entertainment is positively related to audience activity.

H4. Habit-pastime is positively related to audience activity.

H5. Sexual curiosity is positively related to audience activity.

H6. Audience interaction is positively related to audience activity.

H7. BJ interaction is positively related to audience activity.

H8. Information is positively related to audience satisfaction.

H9. Entertainment is positively related to audience satisfaction.

H10. Habit-Pastime is positively related to audience satisfaction.

H11. Sexual curiosity is positively related to audience satisfaction.

H12. Audience interaction is positively related to audience satisfaction.

H13. BJ interaction is positively related to audience satisfaction.

4. Methodology

Measures of the construct

Audience satisfaction is commonly measured with 3 to 5 items. Perse et al. (1988) adapted a single item from Palgreen et al. (1985), which asks overall satisfaction directly. Ferguson and Perse (2004) later expanded questions to 3 items by adding value and pleasure and Godlewski et al. (2010) adapted the same items. Hwang et al. (2007) used five items to measure viewing satisfaction from Kim et al. (1997). Compared to former items, items used by Hwang et al. (2007) are more focused on audiences' perspective and specific in detail. Therefore, this study adapts three items used by Hwang et al. (2007) for audience satisfaction.

Items of Audience activity was derived from Richards (2006) which consists of 1) consuming activity, 2) processing activity, and 3) generating activity. However, the study focused on processing and generating activity by using 4 items. Detailed questions are made appropriately to new media including statements such as; I subscribe a page or a channel of my favorite BJ, I prefer to participate in chatting and content creating, I write on BJ's board after watching the program, and I create derivative work such as fan arts, videos and so on.

The literature reviews of viewing motives can be organized as following <Table 1>. Across the country and period, components of viewing motives are almost the same. The present study also adopt exciting entertainment, habit-pastime, information and sexual curiosity with addition of interactivities.

Table 1. Summary of factors of viewing motives

Perse & Rubin (1988)	Godlewski & Perse (2010)	Kim (2005)	Hwang & Park (2007)
Exciting Entertainment	Exciting Entertainment	Entertainment	Entertainment/ Escape
Pass Time	Habit-Pastime	Pastime	Habit-Pastime
Voyeurism	Voyeurism	Sexual curiosity	Sexual curiosity
Escapist Relaxation	Relax-Escape	Relaxation	Avoidance of Loneliness
Information	Social Learning	Information	Information
Social Utility			

There are several studies which focused on relationship with interactivity and satisfaction in online environment. The level of interactivity and the amount of information was influential to consumer satisfaction in an online retail setting according to Ballantine (2005). Zhao (2003) found that a website's attribute-level interactivity, which refers to an interactivity within a website, has an impact on user's satisfaction dynamically. Here, two synchronous communication (Cesar et al., 2011), 'audience interaction' and 'BJ interaction' will be estimated in order to separate different direction of motivation. Audience interaction refers to the interactivity with others who have the same interest. This is determined because online platform that contains chatting system was thought to be a plausible motivation to use AfreecaTV and the perspective is focused on audiences. Audience interaction contains 2 items; 1) chatting with other audiences and 2) sympathy formation of the same interest. In addition, as a content generator (Richards, 2006), BJ is powerful in both encouraging and controlling audiences' participation. In this study, BJ interaction focuses on real-time interaction, including 3 items; 1) efficiency of communication, 2) influence of BJ interaction to formation of audiences' sympathy, and 3) interactive content production.

Thus, the viewing motives of the study is divided into 6 types and each type is shown in <Table 2>; entertainment/escape, habit-pastime, information, sexual curiosity, audience interaction, and BJ interaction. The following <Table 2> summarizes the operational definitions and measurements of variables used in the study.

Table 2. Operational definition and measurements of variables

Variable	Operational Definition/Types	Measurement Items	
Audience Satisfaction (AS)	Customers' judgments of satisfaction level of AfreecaTV	AS1: Feeling of achievement	
		AS2: Desire to watch more	
		AS3: Overall satisfaction	
Audience Activity (AA)	Perceived activity level of watching AfreecaTV	AA1: Gifting cash items to BJ	
		AA2: Voluntary participation in content creation with BJ	
		AA3: Writing opinions on online boards	
		AA4: Creating derivative works of BJs	
Viewing Motives (M)	Entertainment	E1: Because it entertains me	
		E2: Because it's enjoyable	
	Habit-Pastime	HP1: Because it passes the time away	
		HP2: Because it gives me something to occupy my time	
	Information	I1: Because it gives me useful information	
		I2: Because I can learn about others	
	Sexual Curiosity	SC1: Because I find some of it sexually arousing	
		SC2: Because BJs are sexually attractive	
	Audience Interaction	AI1: Because I can chat with other audiences	
		AI2: Because I can chat with BJs.	
	BJ Interaction		BI1: Efficiency of communication
			BI2: Influence of BJ to sympathy formation
			BI3: Production of interactive content

Data

To conduct structural equation model, a survey was conducted. Pilot surveys were conducted before the actual survey. Also, in order to clarify the questionnaires, the survey was revised by an expert. The respondents of the survey were sampled from the people who watch AfreecaTV. The

respondents were asked to check every questions regard to determinants among 5-point scale. For analyzing data, SPSS 18 and AMOS 20 was used. Overall survey questionnaires are found in Appendix.

The survey was conducted from March 16 to March 20, 2015 online. After filtering out those responses regarded as insincere or inconsistent, 559 samples were finally used in the analysis. Among the participants, 306 were male (54.7 %) and 253 were female (45.3%). Also, the range of an age were distributed from 15 to 59; 150 were 10s (26.8%), 187 were 20s (33.5%), 120 were 30s (21.5%), 65 were 40s (11.6%) and 37 were 50s (6.6%). The distribution is similar to AfeecaTV users estimated by Nielsen Koreanclick (2014. 6). On average, the respondents spend 3.6 hours in the internet a day while they spend 2.1 hours on watching TV a day. An average hour spend to watch AfreecaTV was 1.3 hours a day and the respondents watch AfreecaTV three times a week on average. Among total respondents of 559, 326 (58.3%) said they have favorite BJs and other 233 (41.7%) said they don't have favorite BJs.

Preferred genre were estimated by calculating index. As each respondent were to rank 6 genres from preferring the most (1) to preferring the least (6), the index multiplies the rank by frequency of each genre. Thus, the genre is preferred in an order of small number. As depicted in <Table 3>, game is the most preferred and affairs/stock/education is the least preferred genre. (The genres were referenced from AfreecaTV BJ Festival).

Table 3. Ranking of preferred genres

Rank	Genre	Index	Calculation
1	Game	1509	$1*166+2*100+3*98+4*153+5*15+6*27$
2	Music	1767	$1*76+2*159+3*77+4*141+5*58+6*48$
3	Sports	1840	$1*68+2*164+3*81+4*89+5*97+6*60$
4	Site	2087	$1*66+2*60+3*157+4*39+5*148+6*89$
5	Camera/Eating show	2152	$1*72+2*68+3*89+4*74+5*155+6*101$
6	Affairs/Stock/Education	2384	$1*111+2*8+3*57+4*63+5*86+6*234$

Furthermore, among total respondents, only 116 (20.8%) had a payment experience and 443 (79.2%) had not. Allowing check repetition, star balloon was the most paid item with 92 counts, followed by quick view item (48) and sticker (15). The sample characteristics are summarized in <Table 4>.

Table 4. Summary of sample characteristics

Variables	Categories	Sample	Percentage
Gender	Male	306	54.7%
	Female	253	45.3%
Age	<19	150	26.8%
	20-29	187	33.5%
	30-39	120	21.5%
	40-49	65	11.6%
	50-59	37	6.6%
Payment Experience	Yes	116	20.8%
	No	443	79.2%

5. Results

Prior to test the proposed model and hypotheses, a confirmatory factor analysis was conducted. In order to test the construct validity, exploratory factor analysis was evaluated with Cronbach's alpha coefficients by using AMOS 20. As the result shown in <Table 5>, all factor loadings were greater than the 0.5 thresholds recommended by Hair, Black, Babin, Anderson and Tatham (2006). Also, the constructs indicates fairly good reliability level with Cronbach's alpha values which are all greater than 0.7 (DeVellis, 2012).

Table 5. Results of exploratory factor analysis

Constructs	Item	Loadings	Cronbach's alpha
Audience Satisfaction	AS2	0.879	0.811
	AS3	0.846	
	AS1	0.773	
Audience Activity	AA3	0.900	0.914

	AA4	0.893	
	AA1	0.838	
	AA2	0.821	
Motive 1 (Information/ Audience interaction)	I2	0.712	0.851
	I1	0.703	
	AI1	0.647	
	AI2	0.582	
Motive 2 (Entertainment/ Habit-Pastime)	HP2	0.826	0.836
	HP1	0.814	
	E2	0.770	
	E1	0.755	
Motive 3 (Sexual Curiosity)	SC1	0.864	0.923
	SC2	0.862	
Motive 4 (BJ interaction)	BI2	0.756	0.747
	BI1	0.747	
	BI3	0.712	

In case of viewing motives, 7 types of viewing motives were tied up with four factors. The first factor includes information and audience interaction. This seems reasonable in that audiences who want to interact with others are the audiences who watch AfreecaTV in order to seek for needed information. Secondly, entertainment and habit-pastime were bounded as another factor. This is also plausible because audiences would want to spend time searching for something exciting and entertaining. Sexual curiosity and BJ interaction were the factor that did not mix with other factors. Therefore, hypotheses were reduced from 13 to 9 and can be found in <Table 6>.

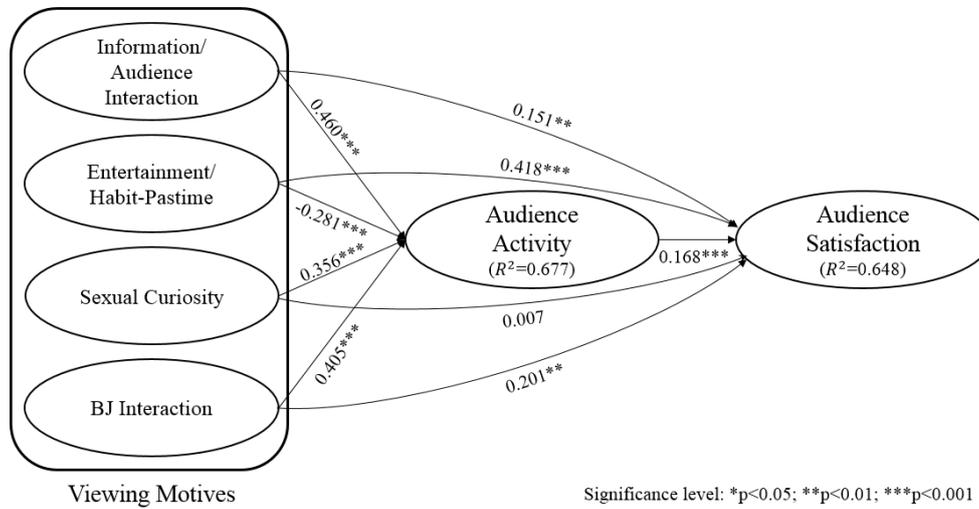
The results of the SEM analysis of the proposed model and hypotheses tests are summarized in <Table 6> and <Figure 2>. The full model was tested by using AMOS 20 and maximum likelihood methods were adopted. Also, all the model-fit indices satisfied the recommended criteria suggested by previous studies.

Table 6. Results of hypotheses testing

	Path	Estimates	C.R	p	Result
H1	Audience activity → Audience satisfaction	0.168	3.226	0.001	Accept
H2	Information/AI→ Audience activity	0.460	7.440	0.000	Accept
H3	Entertain./HP → Audience activity	-0.281	-4.649	0.000	Reject
H4	SC → Audience activity	0.356	10.172	0.000	Accept
H5	BI → Audience activity	0.405	4.856	0.000	Accept
H6	Information/AI→ Audience satisfaction	0.151	2.725	0.006	Accept
H7	Entertain./HP → Audience satisfaction	0.418	7.373	0.000	Accept
H8	SC → Audience satisfaction	0.007	0.215	0.830	Reject
H9	BI → Audience satisfaction	0.201	2.781	0.005	Accept
Model fit	$\chi^2/df=3.924$	RMR=0.048	GFI=0.902	AFGI=0.867	
	NFI=0.913	IFI=0.934	CFI=0.934	RMSEA=0.072	
Recommended Value	$\chi^2/df \leq 3$	RMR ≤ 0.08	GFI ≥ 0.90	AFGI ≥ 0.80	
	NFI ≥ 0.90	IFI ≥ 0.90	CFI ≥ 0.90	RMSEA ≤ 0.08	

The following <Figure 2> presents the standardized coefficients and the R^2 values. Audience activity (0.168) had significant influences on audience satisfaction. All of the viewing motives exhibited strong effects on audience activity. Among the viewing motives, only entertainment/habit-pastime showed negative relationship which is rejected and the rest showed positive relationship with audience activity. Moreover, audience satisfaction was directly and significantly affected by information/ audience interaction (0.151), entertainment/habit-pastime (0.418), and BJ interaction (0.201). However, only the path from viewing motive of entertainment/habit-pastime to audience satisfaction was insignificant. Overall, audience activity and audience satisfaction were explained by independent variables as much as 0.677 and 0.648 of variance.

Figure 2. Results of the model



6. Discussion and Implications

This study search for an integrated framework for audience satisfaction, audience activity, motives, and interactivity. With the advent of new media which enables synchronous communication online, new framework of audience satisfaction model is needed. The unique value of interactivity was incorporated into the basic model, especially into the viewing motives. Based on the findings, the proposed model gives more specific insights to audience satisfaction of online live video streaming service.

Generally, the result of the study supported most of the hypothesized relationship set above and only two hypotheses were not supported statistically; hypothesis 3 and 8. The test result of hypotheses 1, 6, 7 and 9 proposed that audience activity and the viewing motives except sexual curiosity affect audience satisfaction. For example, according to the analysis, one unit increase of audience activity will lead to 0.168 increase of audience satisfaction with high significance. Although there were counter examples of hypothesis 1 (Baek et al., 2008), the study confirms that the audience activity has significant and positive influence on audience satisfaction as other studies (Perse et al. 1988, Godlewski et al. 2010).

With regard to relationship between audience satisfaction and viewing motives, the result is slightly different; while audience satisfaction is positively and significantly affected by information/audience interaction (0.151), entertainment/habit-pastime (0.418), and BJ interaction (0.201), it has no relationship with sexual curiosity. The result indicates that higher motivations of searching information, interacting with other audiences or BJs, entertaining and spending time in AfreecaTV gives higher audience satisfaction. Although high sexual curiosity motivation gives high audience activity, it does not necessarily bring high audience satisfaction. Considering the fact that audience activity has significant effect on audience satisfaction, the result explains that there exists a direct influence of motivations to audience satisfaction.

In case of relationships between audience activity and viewing motives, information/audience interaction (0.460), sexual curiosity (0.356), and BJ interaction (0.405) had positively and significantly influence on audience activity. Nevertheless, unlike an expectation that higher motivation of entertainment/habit-pastime will give higher audience activity, hypothesis 3 was rejected and appealed to have a negative impact on audience activity. The statistic can be interpreted that higher viewing motives of information searching, audience interaction, sexual curiosity, and BJ interaction lead to higher audience activity but not for entertainment or habit-pastime. It means that audiences who join to watch AfreecaTV for excitement and fun do not participate in communication actively because they would rather want to take time to rest and relax.

One of the important findings of the results is that both motivations of interactivity, audience interaction and BJ interaction, turned out to be critical determinant to encourage audience activity and audience satisfaction. Especially, as shown in <Table 7>, because the significance level is higher towards audience activity than audience satisfaction, it can be said that the motivation of interactivity to audience activity to audience activity is more

significant than audience satisfaction. Also, degree of affirmation is also higher related to audience activity than audience satisfaction. Comparing the coefficients of audience interaction and BJ interaction, it seems to have similar degree of positive impacts. However, a noticeable fact is that motivation of audience interaction is highly related with the motivation of information searching but BJ interaction stands as an independent factor.

Table 7. Comparison of interactivity effects

	Audience Activity	Audience Satisfaction
Info/Audience Interaction	0.460***	0.151**
BJ Interaction	0.405***	0.201**

The finding is also very valuable because along with the self-motivation to interact with other audiences, the effort of BJ to interact with audiences has also critical role in improving audiences' motivations. It might be reasonable to interpret that audiences who seek for interaction expect BJs to response actively. Therefore, AfreecaTV should focus on encouraging BJs to interact with audiences actively including fine quality of chatting and audience-participated content.

Finally, the results above proved crucial role of interactivity different from traditional TV watching. As the online technological environment is different, audience activity is focused on participation during watching TV and generating derivative works. Thus, the key motives for achieving both audience activity and audience satisfaction are information searching and interactivity with audiences and content providers in online live video streaming services.

7. Conclusion

This study passed through extensive literature review in order to suggest a new model that explains the importance of real-time communication to audience satisfaction in online live video streaming service. The proposed

model is consisted of total 6 dimensions: audience satisfaction, audience activity, viewing motive1 (information/audience interaction), viewing motive2 (entertainment/habit-pastime), viewing motive3 (sexual curiosity), and viewing motive4 (BJ interaction). Data were collected from the survey conducted with 559 audiences who watch AfreecaTV in Korea. Structural equation model was estimated after factor analysis by using AMOS 20 and SPSS 18 version.

The research findings evidenced that higher audience activity and viewing motives of information/audience interaction, entertainment/habit-pastime and BJ interaction lead to higher audience satisfaction. Also, the research supported that higher viewing motives of information/audience interaction, sexual curiosity and BJ interaction highly influenced audience activity. Surprisingly, however, viewing motive of entertainment/habit-pastime had negative influence on audience activity with high significance. Also, there was no significant relationship between viewing motive of sexual curiosity and audience satisfaction.

One of the most important findings of this study is that real-time interaction is critical in watching online live video streaming service, motivated by both other audiences with the same interest and content provider, BJ. To be specific, the interactivity showed higher significance to audience activity than audience satisfaction. Also, in case of audience interaction, the motivation was related to information searching

A major contribution of the study is to develop a new model for new media environment that integrated synchronous interactivity to motivations. Also, compared to previous literatures which measured the relationships simply by using hierarchical regression analysis, the paper tries to examine with structural equation model. However, despite the interesting implication of this study, caution should be made in generalizing the findings beyond the Korean market. Since AfreecaTV is focused on Korean market, further

research could be conducted for different platform of online live video streaming services with different business models.

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