

The Effect of the Perceived Waiting Time of Viewers on Negative Emotions, Viewing Satisfaction, Viewing Attitude, and Continuous Viewing Intention When an e-Sports Game Pause

Juyeon Lee, Seyun Kim*

Master's course, Department of e-Sports, Dankook University Graduate School, Korea
**Assistant Professor, Department of e-Sports, Dankook University Graduate School, Korea*
seyunkim@dankook.ac.kr

Abstract

The purpose of this study is to find out how the perceived waiting time of viewers of e-sports games affects negative emotions and how these negative emotions affect viewing satisfaction, viewing attitude, and continuous viewing intention. To achieve the purpose of this study, 200 viewers who watched e-sports games more than two to three times were targeted. 197 copies were selected as the final valid sample after excluding three of the collected questionnaires that showed unfaithful answers. For data processing methods, confirmatory factor analysis, reliability analysis, and structural equation model analysis were conducted using SPSS 27 and AMOS 25. Through this, the following results were obtained. First, it was found that the perceived waiting time of the viewer had a significant effect on the viewers' negative emotions in the event of a game pause. Second, viewers' negative emotions were found to have a significant effect on viewing attitudes, but not on viewing satisfaction. Third, it was found that viewing attitude had a significant effect on viewing satisfaction and continuous viewing intention. Fourth, it was found that viewing satisfaction had a significant effect on continuous viewing intention. In other words, the more acceptable and shorter the perceived waiting time due to the suspension of the game pause, the lower the negative emotions of the viewers, and the negative emotions of the viewers ultimately affect the intention to continue watching through viewing attitude and viewing satisfaction.

Keywords: *e-Sports, Pause, Perceived Waiting Time, Negative Emotion, Viewing Satisfaction, Viewing Attitude, Continuous Viewing Intention.*

1. Introduction

Recently, the status of e-sports is increasing day by day. The domestic e-sports industry has grown by more than double digits every year except 2017. According to the Korea Creative Content Agency, the size of the domestic e-sports industry was estimated to be KRW 139.83 billion as of 2019, an increase of KRW 25.97

Manuscript Received: october. 10, 2023 / Revised: october. 27, 2023 / Accepted: october. 31, 2023
Corresponding Author: seyunkim@dankook.ac.kr
Tel: +82-31-8005-3956
Assistant Professor, Department of e-Sports, Dankook University Graduate School, Korea

billion (22.8%) compared to the size of the domestic e-sports market of KRW 113.86 billion in 2018 [1]. The 2022 Hangzhou Asian Games, which were postponed until this year due to COVID-19 last year, was held in Hangzhou, China on September 23. E-sports, which were adopted as the first official event at the Hangzhou Asian Games, consisted of seven sports, including League of Legends (LOL), Battleground Mobile, Street Fighter 5, and FIFA Online 4. Currently, e-sports is attracting a lot of attention as to whether the IOC will select an Olympic sport. The IOC is also positively evaluating e-sports as a way to increase young people's interest in the Olympic Games [2]. Riot Games' popular multiplayer online battle arena (MOBA) game "League of Legends" gained popularity by lowering the entry barrier compared to previous MOBA games and now has a large number of users from all over the world. In South Korea, it has always been ranked as the most popular game that does not miss the top spot in PC room market share. Since July 2018, it has topped the PC room market share for 250 weeks, breaking the longest record [3]. The 2023 LCK Spring Final also renewed its all-time high with 1,463,312 simultaneous viewers [4].

However, LoL e-sports has recently been plagued by various bugs. LoL, which has suffered from various bugs in the past, has recently become more frequent and more diverse. "Pause" refers to a situation in which a game is suspended for various reasons, such as a network connection failure accident, a failure of a PC used, or a software bug (error) during an e-sports game. Long-term pause that occurs in competitions has occurred frequently in the past. In the quarterfinals of the 2012 LOL World Championship, WE and CLE.U, the schedule was delayed due to continuous bugs, and a long pause occurred in the 2018 Jakarta-Palembang Asian Games between South Korea and China, and the scene was also broadcast on public television at the time. Even in such a big competition, I was able to see the pause caused by the bug [5]. The discomfort of players and fans increases day by day, showing no signs of improvement. Players in various parts of each regional league are calling for the resolution of the problem with voices of criticism, but concerns are raised as the league continues without any clear measures.

As such, pause can be seen as a factor that negatively affects both players and fans. In particular, fans sometimes wait a lot of time due to pause while watching or watching games. Therefore, this study attempted to understand fans' perceptions and future consumption behavior due to pause. In other words, we would like to find out how the perceived waiting time of fans caused by the pause ultimately affects the intention to continue watching through negative emotions, viewing attitudes, and viewing satisfaction. The results of this study can be used as evidence that it is important to recognize and improve the pause hosted by sports companies and competitions in the future, which will provide useful data for the development of e-sports leagues and will be meaningful in revitalizing related industries.

2. Research Hypothesis

The hypothesis of this study was established focusing on the relationship between each variable used in the study. In addition, the relationship of the variable tube was used as the basis for hypothesis establishment through the results revealed in previous studies related to this.

Previous studies have shown that perceived waiting time affects negative emotional reactions such as irritation, anger, and boredom [6, 7]. Emotion is a psychological or mental state caused by personal experience, and acts as a factor when judging a specific object or making a decision, affecting behavior [8]. Attitude is a basic variable for public behavior, and positive emotions toward objects can lead to behavioral intentions [9]. Through these preceding studies, it was found that emotional factors influence decision-making or behavior change.

People feel negative emotions such as anxiety, anger, sadness, and fear when they are in dangerous or uncomfortable situations [10]. The negative emotions formed in viewers when watching e-sports games broadcast will affect their viewing attitude and viewing satisfaction. When the audience's viewing attitude is positive, the satisfaction of the program is high. In addition, viewing attitude and viewing behavior are also important variables in the formation of viewing satisfaction [11]. It has been shown that viewing attitude and viewing behavior also function as important variables in the formation of satisfaction [12].

Continuous viewing intention refers to the tendency of users to value and continue to use the media when the actual satisfaction obtained is higher than the satisfaction they seek through the media. Viewers' viewing satisfaction is an important factor in continuous viewing intention, and the relationship between viewing satisfaction and continuous viewing intention can be confirmed through various preceding studies [13, 14]. Therefore, the following hypothesis was established to investigate the relationship between the negative emotions felt by e-sports viewers during the suspension of the game and the perceived waiting time, and to find out the effect of viewing satisfaction and viewing attitude on continuous viewing intention.

Hypothesis 1. The perceived waiting time of viewers in the event of a game Pause will affect negative emotions.

Hypothesis 2. Viewers' negative emotions will affect their viewing attitude.

Hypothesis 3. Negative emotions of viewers will affect viewing satisfaction.

Hypothesis 4. The viewing attitude will affect viewing satisfaction.

Hypothesis 5. The viewing attitude will affect the intention to continue watching.

Hypothesis 6. Viewing satisfaction will affect the intention to continue watching.

In this study, the research model was constructed around the previously established research hypothesis. The research model for this study is shown in figure 1 below.

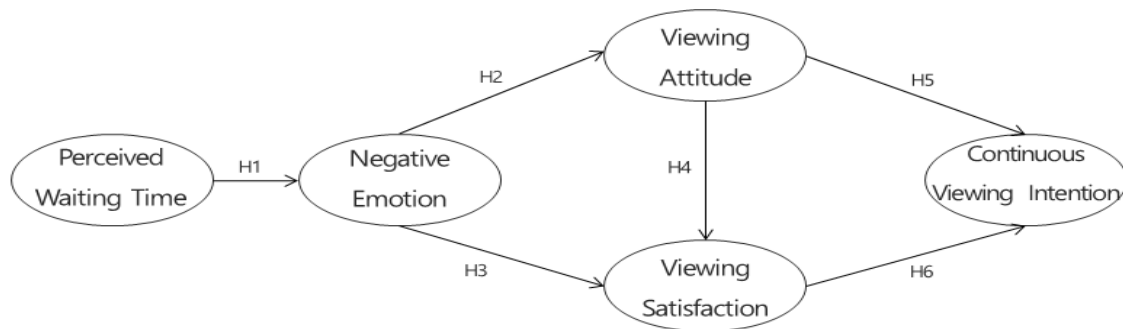


Figure 1. Study model

3. Research Method

3.1 Research Subjects

The subjects of this study were viewers who watched e-sports games more than two to three times, and a

total of 200 people were surveyed. The sampling method used an online Google questionnaire, and the questionnaire was conducted after explaining the purpose and contents of this study so that they could be fully understood. 197 copies were selected as the final valid sample after excluding three of the collected questionnaires that showed unfaithful answers. The general characteristics of this study subject are shown in Table 1.

Table 1. Characteristics of Subjects

Division		Frequency(person)	%
Gender	Male	47	23.9
	Female	150	76.1
	Sum	197	100
Age	10s	27	13.7
	20s	150	76.1
	30s ~	20	10.2
	Sum	197	100
Viewing Platform	Twitch	132	67.0
	YouTube	36	18.3
	AfreecaTV	14	7.1
	Naver	13	6.6
	Others	2	1.0
	Sum	197	100

3.2 Research Tools

The survey tool used in this study used a questionnaire. The composition of the questionnaire was composed by modifying and supplementing the questionnaire used in previous studies for each concept according to the purpose of this study. Details of the composition of the questionnaire are shown in Table 2 below.

Table 2. Composition of survey tools

Factors	Items
Perceived Waiting Time	4
Negative Emotion	3
Viewing Attitude	3
Viewing Satisfaction	4
Continuous Viewing Intention	4

3.3 Data Analysis

For data processing, frequency analysis was conducted to understand the characteristics of the survey target and the general tendency of the sample using SPSS 27, and an internal consistency reliability test of each concept was conducted through Cronbach's α . Confirmatory factor analysis was performed using AMOS 25 to analyze the intensive validity and discriminant validity of the scales. A structural equation model was performed to verify the established research model and hypothesis.

4. Results

4.1 Validity & Reliability Analysis

The confirmatory factory analysis was done for the testing of convergent validity and discriminant validity. The maximum likelihood(ML) method which assumes multivariate normality was used for substantial analysis. In the analysis process, the standard loading value of 1 question of repurchase intention was removed as below .5. The fit of the confirmatory factor analysis was evaluated for the confirmation of the optimal condition of the construct and the variation configuration and the results are shown in Table 3.

Based on the opinion that the fit index in a structural equation model can be judged together with other indexes by a relative index instead of an absolute criteria [15]. Fit was verified by TLI and CFI (.09 or higher), X2/df values (less than standard 3), and RMSEA. [16, 17]. The results of TLI=.951, CFI=.958. X2/df=1.819 and RMSEA=.065 show that the fit was relatively satisfactory. In addition, all the scores of the standardized regression weights (over .5), the value of average variance explained (AVE) and construct reliability (over .7) were more than the standard value showing the satisfactory convergent validity.

Table 3. Confirmatory factory analysis & reliability

Factors	S.E.	M.E.	C.R	AVE	Cronbach's α
Perceived Waiting Time 1	0.713	0.492			
Perceived Waiting Time 2	0.571	0.674			
Perceived Waiting Time 3	0.794	0.370	0.869	0.575	0.872
Perceived Waiting Time 4	0.821	0.326			
Perceived Waiting Time 5	0.858	0.264			
Negative Emotion 1	0.891	0.206			
Negative Emotion 2	0.935	0.126			
Negative Emotion 3	0.939	0.118	0.952	0.798	0.950
Negative Emotion 4	0.924	0.146			
Negative Emotion 5	0.766	0.413			
Viewing Attitude 1	0.905	0.181			
Viewing Attitude 2	0.887	0.213			
Viewing Attitude 3	0.872	0.240	0.934	0.779	0.933
Viewing Attitude 4	0.866	0.250			
Viewing Satisfaction 1	0.831	0.309	0.884	0.657	0.883

Viewing Satisfaction 2	0.752	0.434			
Viewing Satisfaction 3	0.829	0.313			
Viewing Satisfaction 4	0.827	0.316			
Continuous Viewing Intention 1	0.929	0.137			
Continuous Viewing Intention 2	0.894	0.201	0.895	0.683	0.885
Continuous Viewing Intention 3	0.676	0.543			
Continuous Viewing Intention 4	0.783	0.387			

$\chi^2=358.307(df=197, p=.000)$, $\chi^2/df=1.819$, $TLI=.951$, $CFI=.958$, $RMSEA=.065$

If the AVE value of each constituent concept is greater than the square value of the correlation coefficient, it can be said that there is discriminant validity between the two configurations [18]. Therefore, the value of AVE presented in Table 3 was compared with the squared value of the correlation coefficient of each concept in the correlation analysis in Table 4. As the value of AVE is more than the squared value of the correlation coefficient, the scales used in this study have discriminant validity.

After the verification of convergent validity and discriminant validity, Cronbach's α testing was conducted for the verification of the reliability of the internal consistency of each factor. As shown in Table 3, Cronbach's α value for all factors was above .7, demonstrating internal consistency of all factors [19].

Table 4. Correlation analysis

Factors	1	2	3	4	5
Perceived Waiting Time	1				
Negative Emotion	-0.581***	1			
Viewing Attitude	-0.029	-0.184*	1		
Viewing Satisfaction	0.163*	-0.001	0.568***	1	
Continuous Viewing Intention	0.148*	0.001	0.510***	0.766***	1

* $p < 0.05$, *** $p < 0.001$

4.2 Fit of the Model & Hypothesis Test Results

As a result of verifying the fit of the model, $TLI=.947$, $CFI=.954$, $\chi^2/df=1.888$, $RMSEA=.067$. Through this, it was confirmed that the model set in this study was relatively suitable.

The results of this study are as follows. First, it was found that the perceived waiting time of the viewer had a significant (-)effect on the viewers' negative emotions in the event of a game pause. Second, viewers' negative emotions were found to have a significant (-)effect on viewing attitudes, but not on viewing satisfaction. Third, it was found that viewing attitude had a significant effect on viewing satisfaction and continuous viewing intention. Fourth, it was found that viewing satisfaction had a significant effect on continuous viewing intention. Details of the results of this study are shown in Table 5.

Table 5. Model fit & hypothesis verification result

	Hypothesis			Estimate	S.E	t
H1	Perceived Waiting Time	⇒	Negative Emotion	-.857	.110	-7.762***
H2	Negative Emotion	⇒	Viewing Attitude	-.154	.078	-1.986*
H3	Negative Emotion	⇒	Viewing Satisfaction	-.014	.022	-.656
H4	Viewing Attitude	⇒	Viewing Satisfaction	.724	.054	13.505***
H5	Viewing Attitude	⇒	Continuous Viewing Intention	.593	.094	6.308***
H6	Viewing Satisfaction	⇒	Continuous Viewing Intention	.334	.115	2.911**

$\chi^2=379.543(df=201, p=.000)$, $\chi^2/df=1.888$, TLI=.947, CFI=.954, RMSEA=.067

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

5. Conclusion

The purpose of this study is to find out how the perceived waiting time negative emotions that e-sports game viewers have when the game is pause, and how these negative emotions affect viewing satisfaction, viewing attitude, and continuous viewing intention. Specifically, it is meaningful that it has proven the structural relationship between unknown waiting times, static emotions, viewing attitudes, viewing satisfaction, and continuous viewing intentions felt in the event of a game interruption. We found that viewers' waiting time due to pause during e-sports games causes negative emotions for viewers, and ultimately affects continuous viewing intention through viewing attitude and viewing satisfaction. The conclusion obtained through this study is that game companies and operators will have to work to resolve software errors(bugs) to prevent game Pause in e-sports leagues. Also, pause can always occur during e-sports games. Therefore, it is necessary to establish or form a team dedicated to solving problems during the game to find ways to develop content and events for positive satisfaction of viewers during the pause, and to reduce the waiting time perceived by viewers by creating a waiting situation for positive viewers with a quick resolution.

Acknowledgement

"The Department of e-Sports was supported through the Research-Focused Department Promotion & Interdisciplinary Convergence Research Project as a part of the Support Program for University Development for Dankook University in 2023"

References

- [1] The Korea Creative Content Agency, esports Survey Report. <http://www.kocca.kr/kocca/main.do>.
- [2] S.H. Lee, *Interests of esports*, Park Young-sa, pp. 47, 2021.
- [3] Fomos, League of Legends won 1st place for 250 weeks Strong with 42% market share. https://www.fomos.kr/esports/news_view?entry_id=120932.
- [4] Daily esports, 1.46million viewers for the LCK Spring Final an all-time high. https://www.dailyesports.com/view.php?ud=2023041211595216617d8bc5f1a8_27.

- [5] D.J. Kim and A. R. Lee, "The Effect of Perceived Waiting Time on Customers Negative Emotional Reactions and The Effect of Customers Negative Emotional Reactions on Service Quality Evaluation and Switching Intentions: Empirical Evidence from Casual Dining Restaurants," *The Academy of Korea Hospitality & Tourism*, Vol. 11, No. 3, pp. 102-116, September 2009.
- [6] S.Y. Kim, Y. B. Jeon and E. Y. Choi, "The Structural Relationships among Waiting Environment, Perceived Waiting Time, Negative Emotion, Service Quality and Reuse Intention in Screen Sports Facilities," *The Journal of Korean Society for Sport Management*, Vol. 22, No. 6, pp. 61-72, December 2017.
DOI: <https://doi.org/10.31308/KSSM.22.6.4>
- [7] S.S. Moon, "A Study on the Influence Relationship between Negative Emotions, Trust, Distrust, and Negative Behavior of Consumers in a Franchise Corporate Crisis: Focusing on the trust transfer and distrust transfer," *The Journal of the Korea Foodservice Management Society*, Vol. 21, No. 6, pp. 179-201, December 2018.
- [8] Ajzen. I, "The theory of planned behavior. Organizational Behavior and Human Decision Processes," *The Journal of Organizational Behavior and Human Decision Processes*, Vol. 50, No. 2, pp. 179-211, December 2004.
DOI: [http://doi.org/10.1016/0749-5978\(91\)90020-T](http://doi.org/10.1016/0749-5978(91)90020-T)
- [9] I.J. Lim and Y.W. Kim, "A Study on Public Responses to Earthquake Risk Information Types: Focusing on the Mediating Effect of Emotions and the Moderating Effect of Cultural Worldviews," *The Journal of the Korean Society of Press and Information*, Vol. 10, No. 91, pp. 252-287, October 2018.
DOI: <http://doi.org/10.46407/kjci.2018.10.91.252>
- [10] Cha, H. M., *A study on the Viewing Motivations, Attitudes and Satisfaction of Audience in Survival Audition Programs*, Ph.M. Thesis. University of Sungkyunkwan, Seoul, Korea, 2012.
- [11] Cha, H. M., *A study on the Viewing Motivations, Attitudes and Satisfaction of Audience in Survival Audition Programs*, Ph.M. Thesis. University of Sungkyunkwan, Seoul, Korea, 2012.
- [12] Y.J. Jeong and J.M. Kim, "The Analysis of the Relationship between University Students Viewing Motivation and the Viewing Continuity Intention of Vlog on YouTube: Viewing Flow and Viewing Satisfaction as Mediator," *The Journal of the Korea Communication Design Association*, Vol. 71, pp. 147-163, April 2020.
DOI: <http://doi.org/10.25111/jcd.2020.71.11>
- [13] D.W. Kim and Y. J. Lee, "The Impact of Watching Motives of Parenting Reality TV Program on User Satisfaction and Rewatching," *The Journal of the Society of Broadcasting Engineering*, Vol. 19, No. 6, pp. 925-933, November 2014.
DOI: <https://doi.org/10.5909/JBE.2014.19.6.925>
- [14] J.M. Kim, "Influence that Watching Satisfaction Factor of China Internet Entertainment Personal Broadcasting has on the Viewing Continuity Intention - Taking PPL Attitude as Moderator Variable, Negative Emotion, Service Quality and Reuse Intention in Screen Sports Facilities," *The Journal of the Korean society Design Culture*, Vol. 23, No. 3, pp. 165-174, September 2017.
DOI: <https://doi.org/10.18208/ksdc.2017.23.3.165>
- [15] J. F. Hair, R. E. Andreson, R. L. Tatham, and W. C. Black, *Multivariate data analysis*, Englewood Cliffs, 1998.
- [16] R. G. Netemeyer, J. S. Boles, D. O. Mckee, R. McMurrian, "An investigation into the antecedents of organizational citizenship behaviors in a personal selling context", *Journal of Marketing*, Vol. 61, No. 3, pp. 85-98, Jul 1997.

- [17] K. S. Kim “AMOS 18.0 structure equation model analysis”, Hannarae Publishing, 2010.
- [18] C. Fornell, and D.F. Larcker, “Evaluating structural equation models with unobservable variables and measurement error” *Journal of Marketing Research*, Vol. 18, No. 1, pp. 39-50, Feb 1981.
DOI: <https://doi.org/10.2307/3151312>
- [19] J. C. Nunnally, and I. H. Bernstein, *Psychometric theory*, McGraw-Hill. 1994