Development of the Online Activity Index of K-pop Fans

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[Abstract]

This study aims to empirically measure K-pop fans' content and the extent of online activities. To achieve the purpose of the study, the researchers identify the statistically significant online activities that determine the intensity of fan attachment toward K-pop artists. Further, the research confirms the relative importance of various meaningful online activities. Consequently, we can develop the K-pop Online Activity Index (KOAI) model and apply it to this index model empirically for each respondent. We found that the model consists of five online activities of K-pop fans: whether joining the fan club or not, whether paying per view V live+ or not, whether watching VODs associated with artists or not, the degree of fan club writing, the degree of watching a lot on YouTube to improve the value of my artists. This study has practical significance in that it allows K-pop marketers to improve their marketing performance by providing content that will enable them to more efficiently and effectively allocate marketing resources to various online activities to get fan responses. It allows accumulating academic knowledge to understand the behavior in the field of online behavior for K-pop fans.

▸Key words: K-pop, Fan industry, Fandom, Online activity, Fan marketing, Marketing performance

[요   약]

본 연구는 K-pop 팬들의 온라인 활동 내용과 활동의 정도를 실증적으로 측정하는 것을 목적으로 한다. 연구목적 달성을 위해 먼저 K-pop 아티스트에 대한 팬 애착도에 영향을 주는 주요 온라인 활동들을 탐색하였으며, 나아가 해당 온라인 활동들의 상대적 중요성을 도출하였다. 이를 통해 궁극적으로 K-pop 팬 온라인 활동지수(KOAI: K-pop fans' Online Activity Index)를 개발하였고 개별 응답자들의 KOAI를 실증적으로 측정하였다. 연구결과 K-pop 팬 온라인 활동지수(KOAI)는 팬클럽 가입 여부, V live+ 유료 시청 여부, 아티스트 관련 VOD 시청 여부, 팬클럽에 글을 쓰는 정도, 아티스트의 가치를 높이기 위해 관련 유튜브를 보는 정도 등 K-pop 팬들의 다섯 가지 온라인 활동으로 구성됨을 알 수 있었다. 본 연구는 K-pop 마케터로 하여금 팬 반응을 얻기 위한 다양한 온라인 활동에 마케팅 자원을 보다 효율적이고 효과적으로 배분할 수 있는 기준을 제공함으로써 마케팅 성과를 높이게 하였다는 데 실무적 의의가 있다. 또한 K-pop 팬들의 온라인 행동을 이해하기 위한 학문적 지식 축적에 기여가 있다.

▸**주제어**: 케이팝, 팬 산업, 팬덤, 온라인 활동, 팬 마케팅, 마케팅 성과

I. Introduction

A fan in the dictionary defines a person who loves athletics, athletes, plays, movies, songs, and celebrities. In addition, fandom is defined as a person or organization that likes too much in a particular field such as a singer, actor, and athletes [1]. In other words, fandom is defined as groups of fans [2]. So many researchers around the world have explored the phenomena of a fan, fandom culture, and entertainment culture for the specific field. The characteristics of previous research on fans and fandom culture are as follows.

First, the history of research differs depending on the target of the fandom. Even if you categorize your fandom only by sports, movies, and singers, the history of research is a very different story with methodology and contents. In the case of Korea, in the field of sports, research has evolved for fans in the 1990s [3]. In the case of the United States, professional sports have more than 100 years, research on fan and fandom culture on the sport has also shown great academic results in terms of quality and quantity. In the case of Korea, in the field of cinema, fan research was actively conducted in the 2000s [4]. In addition, K-pop fan research has been continuously developed and expanded since the 2000s [5]. In general, fandom

research has been activated in the order of sports, movies, and singers in time horizon.

Second, the heterogeneity of the research theme of fandom culture is found depending on the field such as sport, singer, and actor. When research topics are broadly divided into cognitive responses, emotional responses, and behavioral responses, researches for sports and movie fan have been conducted above three areas of response, however, for singers, the research on fan and fandom had been explored relatively rare at behavioral responses. Third, the scope of fan culture research in offline and online activity areas is different depending on a subject field such as sports, actors, and singers. Much research has been conducted on offline fan activity for sports, movie, and singer fans. However, in the case of singers, studies on online activities have been found relatively rare.

Based on the characteristics of the previous study on fan phenomena, we found that research on online fan activity targeting singers remains relatively blank from an academic perspective. Therefore, this study aims to fill this gap academically and empirically. To achieve the purpose of the study, first, we try to extract the significant fan activity of fans for K-pop singers

and explore its importance among activities. Second, to trace the online fan activity on an individual fan basis, we will develop a 'K-pop Fan Online Activity Index' model. Depending on where we put our research target, fan's online activities are all different. Therefore, this study focused on singers limited to Korea and limited research to the K-pop idol field. Through this process, marketers can identify significant online activities of K-pop fans, providing marketers with the essential data to execute marketing resources to stimulate fans effectively. Also, academically this will accumulate the empirical research on the behavioral response of k-pop fans, where the academic research on fan phenomena has been explored relatively rare.

II. Literature Review

1. Definition of Fan

Korea's K-pop has received much attention on economic effects beyond cultural phenomena. CNN has dealt with the diffusion phenomenon of the Korean Wave in an article titled Look at the Revival of East Asian Popular Culture for 10 Years [6]. Hyundai Research Institute estimated economic effects for 10 years from 2014 to 2023 after the debut of BTS [7], The production inducement is expected to reach 41 trillion won and added a value of 14 trillion won. The effect of increasing BTS' consumer goods exports is more than $1.1 billion annually [8].

Underlying this economic effect is a particular consumer group called fans. When discussing fans with K-pop only, it believes that idol fandom is different from the 1st and 2nd generation idol fandom. The current fandom has been evaluated as evolving beyond the simple fandom to fan-summer (Fan + Consumer). JoongAngIlbo [9] asserts that fans' feelings when they like idols are not as straightforward as being organized in words like "similar romance." And recently, the active consumption and support of the fan base have even interpreted that "I will nurture" involves the

mind. Here, interpreted that the friendship that "my idol must be more successful than other idols" is also underlying.

Therefore, K-pop fans can be interpreted as various concepts such as buyers, consumers, lovers, attachments, management, self-rationality, etc. However, such metaphorical phenomenological interpretations are often still subjective interpretations of researchers. This is the point where various interdisciplinary empirical studies of K-pop fan characters are needed.

Table 1. summary of Previous Fan Research

Researcher	Characteristic	Consumer Behavior		
		Emotional Response	Cognitive Response	Behavioral Response
Oh Seung-Wook et al. [10]	Fan relationship network		●	
Berbigier, Mathieu. et al. [11]	Foreign fans		●	
Kim Jae-Hwan [12]	Sports brands and sports stars			●
Kang Fu [13]	Idol in Korea and China			●
Na Bee-Rang et al. [14]	Price elasticity and sensitivity on sports fans		●	
Han Yu-Hee [15]	Sense of solidarity of fandom		●	
Yeo Su-Kyeong et al. [16]	Impact of fandom on brand activation		●	
Jeon Jae-Young et al. [17]	Indicators of the fandom		●	
Yoon Yeo-Kwang [18]	Factors of BTS's popularity		●	
Kim Ji-Sun [19]	Online fan community		●	
Choi Seung-Eun et al. [20]	Fashion style and fandom		●	

2. Research Theme of Fan Culture and Fan Industry

2.1 Research for Korean Fans

Research on fan culture was started with research in the sports field and rock stars. In the case of

South Korea, research was fostered and developed for fans in the 1990s [21]. In the field of cinema, fan research was actively conducted in the 2000s [4]. In addition, K-pop fan research has been continuously developed and expanded since the 2000s [5].

Because the existing research is enormous, this study reports on the related literature on fans and fandom for singers, sports stars, and movie actors, as shown in Table 1 only for the contents of the last three years. To classify these studies into schemata, the researcher, research topic, characteristics, and consumer behavior (emotional, cognitive, and behavioral responses) are examined and described as follows. Kim et al. [22] classify the human response to stimuli into three categories: emotional, cognitive, and behavioral responses.

The characteristics of these studies are summarized as follows. First of all, there is relatively more research on singers than on movies and sports stars in terms of research subjects past three years. Second, in terms of research topics, cognitive responses were relatively more studied. However, emotional and behavioral responses for fans were somewhat less studied.

2.2 Research Related to Fans in Foreign Countries

The summary of the results of the literature review of fans' research outside Korea since the 2000s has the following features. First, in terms of research targets, the United States was the most active in sports star research. The research was ongoing for sports fans from the 2000s to the 2010s.

Second, in terms of research subjects, the study of singer fans in the entertainment industry has increased significantly compared to the studies of sports star fans since the 2010s. Third, in terms of research topics, as the internet developed new technologies in the 2010s, online fan networking began to be frequent as a study subject. In other words, many online communities such as fan clubs, cafes, and blogs appeared as research subjects. Therefore, we can conclude that fan research is currently expanding from offline to online activities.

Fans are a powerful consumer group with a high consumption capacity. To study consumer behavior, we need to understand consumers' emotional, cognitive, and behavioral responses. Therefore, the literature was examined according to consumer behavior by research area. Much research has been conducted on emotional responses in the field of sports, but Bauer et al. [23] was the representative study on cognitive responses. In the area of behavioral responses, there were more offline studies than online studies. Emotional, cognitive, offline, and online research in the cinema field began in 2000. For singers, online research on emotional and cognitive responses is still actively examined. However, as shown in Table 2, it can be seen that the online study of singers remains relatively gap or blank in the academic aspect.

Table 2. Differentiate between Fan Research Targets and Consumer Behavior among Literature

Research Target	Emotional Response	Cognitive Response	Behavioral Response	
			Offline	Online
Sports	-Trail [24] -Matthews [25] -Hong et al. [26] -Bauer et al. [23] -Reysen [27] -Gencer [28]	-Bauer et al. [23]	-Bristow [36] -Hong et al. [26] -Reysen [27] -Bee [37]	-Ioakimidis [39]
Movie	-Shefrin [29] -Rapelje [30]	-Orgeron [33]	-Rapelje [30] -Orgeron [33]	-Shefrin [29]
Singer	-Lee et al. [31] -Hanifah [32]	-Kim et al. [34] -Lee et al. [35] -Hanifah [32]	-Hanifah [32] -Abdar and Yen [38]	

III. Research Method

1. Research Scope

Based on the literature review of previous research, it is expected that the fan activity of each research subject will be different according to the subject field, therefore, the research subject is limited to K-pop singers. In areas of behavioral study where the research results are insufficient, the scope of research measurement is focused on online activity. Subject space is limited to the particular country, South Korea, because there are many differences among users in countries such as the use of SNS, OTT services, and mobile service brands. For example, individuals like China cannot access specific online media such as Youtube. In Korea, the goods for BTS can be bought on WEVERSE SHOP directly online. However, fans in Japan can buy BTS's goods on Shopify. The seller channels can be different according to country. Therefore, in order to ensure the validity and reliability of the measurement, the scope of research was set to online activities in Korea for K-Pop.

The composition of the fan population of female K-pop groups and male K-pop groups is different. Therefore, the extent of online activities may vary depending on the demographic characteristics of the fans. Therefore, the scope of the study is limited to the male boy group only. In this study, BTS, EXO, Shainee, and Daniel Kang were selected as the research target.

2. Extraction of K-pop Fan Online Activities

Hong et al. [40] divided the activities of fans who like K-pop into offline activities and online activities. They also divide their fan activity into formal fan club events and informal fan club events. This study will include both formal fan club activities and informal fan club activities in the online activities extracted from Hong et al. [40] as the research object activities. Table 3 shows the online activity measurements used in this study. In the table, "V live+" is a VOD service platform of OTT mainly used in South Korea. The questions in Table 4 are independent variables that constitute the online activities of fans.

Table 3. K-pop Fans' Activity Categories by Hong et al. [40]

	Activities in Official Fan Clubs	Activities Out of Official Fan Clubs
Offline Activity	Applying to domestic concert viewing Watching domestic concerts Watching foreign concerts Applying to domestic fans meeting Watching the meeting of domestic fans Participation in a public release	-Visiting artists and musicians exhibition hall -Visiting artist pop-up store -Buying cheer stick -Purchasing official goods outside the cheer stick -Buying doll -Participation in birthday advertisements and publicity advertisements -Watching artists' films -Buying concert specific products -Purchasing Album -Purchasing art-related books -Visiting airport entry standby -Flying with fans -In artist's company, artist dormitory wandering
Online Activity	Joining the official fan club Visiting the official fan club Blogging official fan club message Uploading official fan club comments	-Comment on SNS -Sound source purchase -Usage streaming -Watching a lot of artists YouTube -Comment on YouTube -Viewing V live VOD for free -Viewing V live VOD monthly rated viewing -Watching V live VOD with pay per view -Writing Informal fan club message -Participating in SMS voting of Broadcasters -Messages on broadcasters and media websites -Hashtagging, Driving hater

Table 4. K-pop Fans' Activity Categories

Item	Activities	Scale
Q1	Sound source purchase	Total ( )
Q2	Usage streaming	Week ( ) hours
Q3	V live VOD for free	Week ( ) hours
Q4	Watching Youtube for my artists	Yes( ) No( )
Q5	Paying per view V live+	Yes( ) No( )
Q6	Watching VOD associated with artists	Yes( ) No( )
Q7	Join the fan club	Yes( ) No( )
Q8	Visiting Fan Club	Mouth( ) times
Q9	Fan club writing	Mouth( ) times
Q10	Writing fan club reviews	Mouth( ) times

3. Fan Attachment

In order to measure the fandom intensity as a dependent variable, the attachment was used. From the existing literature, through the measurement of fandom intensity, attachment as a construct has been used widely, especially in the field of the sports and entertainment industry [41-42]. Based on the previous studies, we measured the attachment using 7 items with 7 points likert scale. Specific items of measurement of attachment are as follows: I love the artist, The artist has a charm that captivates me, I feel like the artist and I are very close, I am contributing to the artist's growth, The agency loves my artist, It feels like the agency and the artist are very close, I think the agency is contributing to the development of the artist.

4. Sampling

This study collected samples by convenience random sampling. Because the entertainment companies in Korea have not disclosed the demographic characteristics of the official fan club members. Most of the studies on the existing fan clubs have also extracted convenient samples. The samples were interviewed in-depth interview with the questionnaire from July 2019 to January 2020 and collected data [16].

5. Index Development

In order to develop the online activity index of K-pop fans, the following steps have been taken. In the first stage, a questionnaire survey of attachment and online activities was conducted. In the second stage, we conducted regression analysis. The attachment is taken as the dependent variable, and the online activities are taken as the independent variable. In the third stage, we identified the relative importance of online fan activities through a standardized regression coefficient.

The value of significant online activity and its standardized regression coefficient is determined according to individual respondent basis in the fourth stage. The combination of two values is implemented. Through this process, we could determine the degree of the online activity of individual fans. In the fifth stage, the highest score of the individual activity score calculated in the sixth stage is 100, and the relative activity level of other individuals is measured. We call it the Online Activity Index of K-pop Fan. In the sixth stage, the K-pop online activity index of individual fan was distributed, and conducted the Komogorov Smirnov test for normality of distribution.

IV. Results

1. Sample Description

For the purpose of this study, we collected behavioral information from 130 samples. The sample consisted of 76.9 percent of females. At the age level, those over 19 to 20 years old accounted for the most, accounting for 46.9% of the sample. The demographic characteristics of the sample are shown in Table 5

Table 5. The Demographic Characteristics of the Sample

Object		N	Percent
Gender	Female	100	76.9%
	Male	30	23.1%
Age	15~18	11	8.5%
	19~20	61	46.9%
	21~24	41	31.5%
	25~29	9	6.9%
	Over 30	8	6.2%
Total		130	100%

2. K-pop Fan's Online Activity Index

In the second stage, first of all, the score of response to the 7 questions about artist attachment degree is added as the value of a dependent variable. Next, in Table 4, ten online activity measurement questions are used as independent variables. The reliability test result of the dependent variable is shown in Table 6. The dependent variable's Cronbach's alpha value is 0.864. There is strong internal consistency between items. Regression analysis was performed using the two values. We eliminated the items of regression coefficient with insignificant results and only extracted variables with significant regression coefficients. Five questions were found to be statistically significant (Table 7). The regression analysis showed that the F value of the regression equation was 21.083 and the probability of significance was 0.0001. Five variables were found to explain 45.9% of attachment. That means R^2 is 0.459.

Table 6. Cronbach's Alpha of Dependent Variable

Dependent variable	Cronbach's Alpha	Number of Items
Attachment	0.846	7

Table 7. The Result of Regression Analysis

Variable	B	β	t	p
Constant	26.450	–	23.710	0.000
FC	4.906	0.268	2.997	0.003
PV	4.681	0.285	3.442	0.001
VV	2.895	0.160	1.793	0.075
FW	0.091	0.151	2.166	0.032
WY	0.003	0.150	2.148	0.034

R^2: 0.459, F-value: 21.083
FC: join the fan club, PV: paying per view V live+, VV: watching VODs associated with artists, FW: fan club writing, WY: watching Youtube for my artists

Among the K-pop fans' online activities, five statistically significant activities which affecting their fan attachment were extracted. The variables that were statistically significant at 90% or more of the confidence level were 'whether to join the fan club', 'whether paying per view V live+ or not', 'whether watching VODs associated with artists', 'the degree to fan club writing monthly', 'the

degree to watching a lot on YouTube yearly to improve the value of my artists yearly'.

The relative importance between them was measured by standardized coefficients: 'whether paying per view V live+ or not'(0.285), 'whether to join the fan club'(0.268), 'whether to watching VOD s associated with artists(0.160)', 'the degree of fan club writing monthly(0.151)', 'the degree of watching a lot on YouTube to improve the value of my artists yearly(0.150)'. Hereby, the K-pop Fan's Online Activity Index (KOAI) model has been completed. The model is shown in Equation 1.

$$KOAI_i = 0.268 \times FC_i + 0.285 \times PV_i \quad (1)$$
$$+ 0.160 \times VV_i + 0.151 \times FW_i$$
$$+ 0.150 \times WY_i$$

Where, KOAI is K-pop Fan's Online Activity Index.

i = respondent number
FC = joining the fan club
PV = paying per view V live+
VV = watching VOD associated with artists
FW= fan club writing
WY= watching YouTube for my artists

Individual K-pop online activity degree was calculated based on the above-standardized regression coefficients for five activities. After multiplying the responses of significant online activities by the individual respondent and the standardized regression coefficients for each activity, the sum of all five was performed to measure the online activity degree of each fan.

After calculating the online activity degree of the individual respondent, the minimum value is 0 and the maximum value is 172.92. The score of the highest activity value for each individual was converted into 172.92 points to 100 points, and then Yi was converted into a relative value of 100 points for the remaining individual activity points. As a result, it was possible to know the relative degree of online activity for fans an individual basis. This is

regarded as K-pop Fan's Online Activity Index.

This index has a perfect score of 100, with a maximum of 100 and a minimum of 0. The mean was 16.2 and the standard deviation was 34.209. The distribution of 130 K-pop Fan's Online Activity Index is shown in Figure 1. Among them, 20 who got scores of 85-100 was accounted for 14.6% of the total sample, and 81.5% of the respondents received an activity index of less than 10 scores. The results show that 14.6% of the sample extremely and actively did fan activity beyond the average online fan activity.

The final step was to test whether the distribution of individual Fan's Online Activity Index had a normal distribution. The results of Kolmogorov-Smirnov's normality test are shown in Table 8. According to Table 8, the significance probability was 0.0001, which was significant at the significance level of 0.05.

Table 8. Result of Kolmogorov-Smirnov Test for Fan's Online Activity Index

	Kolmogorov-Smirnov		
	Statistic	The Degree of Freedom	Significance Probability
Fan's Online Activity Index	0.403	130	0.0001

In other words, the dissatisfaction with the normal distribution which is the alternative hypothesis means that the individual Fan's Online Activity Index doesn't satisfy the normal distribution. Look at the histogram it is not a normal distribution visually(Fig. 1).
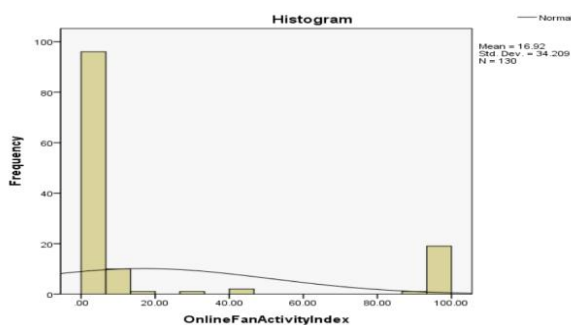

Fig. 1. Histogram of Fan's Online Activity Index

V. Conclusions

Although the research on fan and fandom has been explored widely and long-term period at sports, movies, and singers, the studies on behavioral online activity of K-pop fans academically are relatively rare. This study aims to fill the gap empirically by measuring online activities of K-pop artist fans which is blank in the academic field. Specifically, first the researchers want to identify statistically significant online activities that determine the strength of fan attachment towards K-pop artists. Second, we want to identify the relative importance of the various online activities that determine fan attachment. Third, the strength and degree of online activity of K-pop fans were measured using the significant online activities and relative importance of fans activities identified in the first and second steps. This is defined as K-pop Fan's Online Activity Index. By developing a model to measure this index, we tried to empirically measure this index based on individual respondent.

Among the previous study related to fan and fandom, most of them have dealt the fandom in the terms of society and culture such as fan culture and its practices. However, Jeon Jae-Young and Kim Myoung-Jun [16] try to find a new index which can measure the scale of each K-POP group fandom. Their study focuses on fandom data and estimating the fandom scale. However, this study 0nly focus on the scope of K-pop fan activities, not scale of each K-pop fandom.

According to the empirical analysis, the variables that can trace K-pop online activity are 'whether to join the fan club', 'whether paying per view V live+ or not', 'whether watching VODs associated with artists', 'the degree to fan club writing monthly', 'the degree to watching a lot on YouTube to improve the value of my artists yearly'. Also this study provided the degree of impact of this activity on fan attachment through a standardized regression coefficient.

In practice, it was basic data by providing the marketers with the meaningful contents of K-pop fans' online activities, the marketers can carry out marketing activities that can effectively distribute the marketing resources and obtain the most optimal fan response. In this study, it was found that marketers should stimulate the five online activities. In addition, it was found that they should actively promote 'joining fan club' and 'consumption of online content VOD such as V live' which are relatively important for fan. In particular, only 14.6% of the sample showed extreme online activity. This shows that among fans specially very active fan should be highly individualized, segmented and managed by the marketers.

This study has an academic contribution in that it supplemented the area lacking in online fan activity research. In other words, especially in a situation where research on fan activity targeting singers is lacking, this study's identification of k-pop fan activity, classification of activity types, and indexing are essential contributions to the study of k-pop consumer behavior. Therefore, this study will provide the opportunity to accumulate academic knowledge to understand the behavior of online activity for K-pop fans which is relatively less academically invested. In addition, this study is significant because it fills in the relatively rare field of empirical research on online activities of k-pop fans.

From a practical point of view, this study contributes to providing marketers with primary data to effectively and efficiently manage their fans online. Recently, various technologies such as metaverse, virtual reality, and augmented reality have been introduced into the entertainment industry faster due to Covid-19. Due to these various technologies, fans are enjoying a different experience online than before. Therefore, this study will contribute to the study of various IT-based fan activities.

The limitations of this study are as follows. First is the limitation of the research's scope. This research was conducted only on the space of Korea among the global phenomenon called K-Pop. It is also the result of empirical analysis based on the convenience sample. We should avoid generalized interpretation. Second, the activity of very few fans overpowered other fans. In-depth activity studies should be conducted for these heavy users only. Third, this study made it possible for practical marketers to know where to focus their marketing resources among various online activities to be performed for their fans. However, the results of this study are limited to online activities acquired prior to Covid-19. Due to the global pandemic, K-pop companies have intensively strengthened their online activities in the past two years. Such enhanced online activities are not reflected in this study. Fourth, while this study is ongoing, K-pop fans' online experiences change because of the global pandemic. This study does not reflect these kinds of changes, such as technical experience. Therefore, future research should further explore and reflect the scope of fans' online activities in terms of technology.

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