디지털 콘텐츠 구매를 위한 고객 및 미디어 요인: 다층수준 접근 방식

Audience and Media Predictors for Digital Content Purchases: A Multilevel Approach

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─────────────── 요　약 ───────────────

　　기존의 디지털 콘텐츠에 대한 지불 의사를 고려한 연구들은 대부분 고객 요인과 개인 수준에 중점을 두어 진행되었다. 이런 한계를 보완하기 위해, 본 연구에서는 고객/미디어 요인과 개인/가구 수준의 두 가지 축을 고려하여 디지털 콘텐츠 구매에 영향을 미치는 요인을 찾기 위한 다층수준 분석을 진행하였다. 4,313가구 내 10,172명의 개인을 대상으로 분석한 결과 영화 관람, 클라우드 서비스 경험, 멀티스크린 서비스 이용 등 개인 수준의 미디어 요인이 디지털 콘텐츠 구매에 가장 큰 영향을 미치는 것으로 나타났다. 가구 수준에서는 노트북, 무선 라우터 및 태블릿의 수 등의 미디어 요인이 가구 규모나 가구 소득과 같은 고객 요인보다 더 큰 영향을 미치는 것을 확인하였다. 연구 결과를 통해 개인뿐만 아니라 가구 수준의 고객과 미디어 요인을 통합적으로 고려함으로써 개인의 디지털 콘텐츠 구매 행태에 대한 이해를 높였고, 멀티스크린 서비스 이용의 중요성을 말하였다. 또한 콘텐츠 제공 업체가 멀티스크린 환경을 활용함으로써 신규고객 유치 및 디지털 콘텐츠 판매 증진에 기여할 수 있음을 밝혔다.

키워드 : 고객 요인, 미디어 요인, 개인 수준, 가구 수준, 디지털 콘텐츠 구매, 다층수준 접근

Ⅰ. Introduction

　　Along with the advances in new technologies, including various types of media devices and the development of the Internet, the media usage of individuals has dramatically changed. People have changed their media usage patterns by using a variety of media devices and purchasing digital content directly such as movies, broadcasts, and music. Content has become a purchased item, and customers' content purchasing is steadily increasing. According to research conducted by PQ Media, a global media research group, global consumer spending on media content grew an estimated 4.3% to $1.906 trillion in 2019 (PQMedia, 2020). The digital

content market is several orders of magnitude greater in size and scope than it was a decade ago, and digital consumption in content market is projected to increase its market-share rapidly from 40.7% in 2014 to 61.6% in 2023 (PWC, 2019).

Under these circumstances, global media companies including platform, device, and telecom companies are focusing on digital content as a way to improve their competitiveness (Prasad *et al.*, 2003; Taylor, 2001). As media companies continue their struggle to attract customers with a willingness to pay for digital content, the need to better understand users' expenditures has grown. For these reasons, many recent studies tried to explore the factors influencing customers' digital content consumption. For example, Khan (2017) and Hamari *et al.* (2017) focused on concrete motivation as a key factor influencing such consumption and Horng *et al.* (2016) revealed that experience with online purchasing also has a significant effect on willingness to pay. In addition to the effects of individual users, a few researches have revealed that family media habits and the house environment are important for understanding an individual's behavior (Coyne *et al.*, 2020; Jagtiani *et al.*, 2019). Despite the efforts and findings of previous literatures, there are few attempts to consider factors influencing on digital content consumption from an integrated perspective at individual and household levels. Taking a look from an integrated perspective including household level would be a critical part of understanding individuals' digital content purchases. We thus suggest the following research question: *which individual and household levels factors influence digital content consumption?*

Our study differs from existing studies in that it expands a media use model (Webster *et al.*, 2000) by adding multi-screen related variable and considering two-level data (individual and household levels). First, this study uses two-level data, namely, individual and household level data. Many previous studies have emphasized the importance of the household with regard to media use. They have examined the influence of household's media use and media consumption habits (Lee and Chae, 2007; Livingstone, 2002; Peled, 2018), since the media environment are usually bound in household (Brause and Blank, 2020; Ley *et al.*, 2014) and some technologies, accounts, and devices can be shared among household members (Matthews *et al.*, 2016). This study thus attempts to examine whether family features and household environmental factors influence an individual's media use.

Second, we expand the media use model by considering the use of multi-screen service as a crucial determinants of individuals' digital content purchases. For this purpose, we refine the factors affecting digital content purchases based on the model developed by Webster *et al.* (2000), which categorizes these factors into audience and media factors. Beyond previous researches focused solely on the audience factor (e.g., individual characteristics), we attempt to find the influence of the media factor (e.g., technology ownership and exposure of online behaviors). Taking a step further, we would like to reflect the latest media trend by considering the multi-screen usage as an important variable of the media factor. Revealing the factors influencing on digital content purchases from two axes considering integrated perspective can enlarge our understanding of individuals' media use behavior. Additionally, with many industries focusing on increasing the number of single-person households for their business, we would like to provide an important hint of how to interpret the household of single-person households in the media industry.

Ⅱ. Theoretical Background and Literature Review

2.1 Theoretical Perspectives on Media Use

To understand the media usage and selection process of users, previous studies used various kinds of theories: economic model of program choice, selective exposure theory, and use and gratifications theory. First, based on the economic model of program choice, Steiner (1952) stated media selection behavior is similar to the purchasing of conventional consumer goods. Second, according to selective exposure theory, people want to maintain, perceive, and be exposed to media selectively and in a manner consistent with their attitudes and beliefs. These studies go under the studies related to the 'mood management theory' that people's emotional states affect program choices (Hartmann, 2009; Zillmann and Vorderer, 2000). Lastly, use and gratifications theory considers that patterns of media use are determined by not only each person's motivation but also expectations of how well different media content will gratify their needs. All these three theories based on individual preferences, but it is criticized that preference is not as absolute as they stated. Also, there is a limitation to understanding the behavior of the audience.

In fact, the behavior of the audience is influenced by many other things besides personal preference. To overcome the limitation and explain media use behavior, Webster *et al.* (2000) proposed an integrated model of audience behavior. An integrated theoretical framework takes the audience factors and the media factors into account as the causes of media exposure. Within each category, it was divided into structural and individual factor. Structural determinants describe factors that are characterized by members of a population

group. Also, individual determinants are micro-level variable that vary from person to person. The four divisions (structural features of the audience, individual audience characteristics, structural features of the media, individual media environments), divided by two axes, reflect different levels of analysis and present a conceptual framework to identify media use behavior.

Specifically, the audience factors are divided into the structural and individual characteristics of the audience. The structural features of the audience focus on the size and location of the audience, and the availability to enable media use. Individual audience characteristics indicate the individual characteristics and people's preferences. At this time, studies focus on individuals and assume that a person's preferences can be freely exercised in media selection. Next, media factors can also be considered structural or individual. The structural features of the media include market conditions and how content is organized, such as content options, coverage, and recommendation system. On the other hand, individual media environments represent a personal media environment, such as technologies owned and subscriptions. Although the model suggests a wide relationship, it does not propose the hypotheses to be verified or analyzed by data. It also does not reflect the characteristics of households despite considering structural determinants. Today, although most households have multiple media devices, they tend to share media use in groups, especially when using television (Hess, 2009; Webster *et al.*, 2000). Thus, households features are important influencing factors, however, recent studies still mainly focus on individual's preferences and characteristics (Deuze, 2011). While studies of media consumption within households have been conducted on negotiations between competing media preferences, there is a lack of research on how the characteristics of households affect individual media consumption.

2.2 Purchasing Digital Items

With a shift from traditional to digital media, the digital content industry has grown rapidly in the form of on-line gaming, e-books, e-learning, Internet broadcasting, and e-music (Bhattacharjee *et al.*, 2011). Nowadays, consumers are spending more time each day online and purchasing digital content. With a growing impetus toward paid digital content, global IT companies including Google, Apple, and Netflix have recognized the importance of providing profitable digital content and have entered the market. These companies have begun to diversify their sources of revenue by moving from free content to a pay-for-content model, and have expanded their efforts to attract customers (Goldman, 2001; Ye *et al.*, 2004). For these reasons, understanding the factors that influence the purchasing of digital content is important, and researchers have recently begun focusing on this topic.

Several previous studies have explored the factors affecting online consumer behaviors (Doong *et al.*, 2011; Song *et al.*, 2012; Udo *et al.*, 2010). With respect to digital content, some studies have focused on user motivation. Ho and Dempsey (2010) analyzed the user motivations that influence the use of digital content. Their study identified four potential motivations and found that Internet users, who are more individualistic and/or altruistic among motivations, tend to share more digital content than other users. Lopes and Galletta (2006) examined potential factors influencing willingness to pay for intrinsically motivated digital content and indicated that potential consumers focus on expected benefits as the main antecedent for their willingness to pay.

In addition, several studies have identified the factors that affect willingness to pay for digital content from user perceptions. Based on a survey, Dou (2004) investigated the determinants of Internet users' willingness to pay for digital content, and verified that their experience with online purchasing have a considerable influence on their decision to pay for digital content. Wang *et al.* (2005) identified that willingness to pay for digital content is positively related to the perception of convenience, essentiality, added value, and service quality, as well as to the usage rate of a given service. Wang *et al.* (2013) found that perceived value has a significant influence on consumer's intention to purchase digital content services using a value-based adoption model.

The most important thing that we found is previous studies on the purchasing of digital content focused only on individual factors that were mainly employed from the audience factor, not media factor. These previous studies have not considered the media environment that individuals have, and they have limited tocover influencing factors at the household level. Moreover, the household is important to understand individual's media behavior because some technologies, accounts, and devices can be shared among household members (Ley *et al.*, 2014). In practice, Google Play offers Family Library to share purchased apps, games, movies, TV shows and e-books and audiobooks with up to 5 family members. In addition, Family's contents sharing in gaming environments has been more extensively studied with family tie (Boudreau and Consalvo, 2014; Chen *et al.*, 2012). However, past studies are limited attempts to consider both individual and household level factors.

To fill this research gap, we covered both the individual and household levels. Applied along with the audience and media factors, our study extends an understanding of user behaviors. Moreover, in a situation where the number of single-person households is continuously increasing in worldwide (Snell, 2017), we would like to study how the factors of household levels affect individuals' digital content purchases and propose an insight.

Ⅲ. Research Model

To identify the factors that influence the purchasing behavior of digital content, this study firstly analyzes audience and media factors using Webster's an integrated model (Webster *et al.*, 2000) as the research framework. Webster's model has been mentioned to understand the complex media environment. This study overcomes the limitations of previous studies focusing only on individuals rather than households and considers both individuals and households. The study is to study media use behavior based on a two-level classification, namely, individuals and the household in examining digital content purchases. Furthermore, the study was examined through four variables consisting of Individual-audience, Individual-media Household-audience, and Household-media.

Individual - audience. It includes gender, age, income, and education. These variables playing a crucial role in general consumption have shown that effect on media use in previous studies (Barletta, 2003; Correa *et al.*, 2010; Howard and Massanari, 2007). Specifically, Dutta-Bergman (2004) argued that the younger generation and men mainly prefer new media sources such as the Internet, whereas the older generations prefer traditional media types such as print media and public television. In addition, Van Rees and Van Eijck (2003) stated that educational level has a positive or negative correlation for informational Internet use and commercial media. Income also mentioned in several previous studies (Comstock and Scharrer, 1999, 2001; Gentile and Walsh, 2002).

Individual - media. It represents the media environment surrounding the individual. Specifically, individual-media variables indicate media exposure in various contexts, such as social networking services (SNSs), blogs, Internet cafés, non-digital content expenditures, and multi-screen service usage. It considers an important element in understanding the individual behavior, for example, Ruiz Mafe and Sanz Blas (2006) stated that internet exposure and online experience lead to willingness to purchase online based on Internet dependency. Additionally, individual-media variables also have an important and positive relationship with the use of traditional and new media. Especially, in recent years, researchers have focused on the fundamental change in how individuals are choosing to use and consume their media in multi-screen environment. The multi-screen environment which means media consumption using multi-screens (TVs, PCs, tablet PCs, smartphones, etc.) is an important part of media as it is natural for the audience to use more than one device at a time or share a single content through multiple devices.

Household - audience. It includes the number of family members, the type of household, and the total household income that characterize the household. Woodard and Gridina (2000) argued households with higher annual incomes spend more time using the media. Leung and Wei (2000) showed that household income has a positive effect on the level of mobile use. In addition, several studies have been conducted on household size and type. These previous studies revealed household-audience variables such as type, size, and income of the household are important factors of media use on family members (Brown *et al.*, 1990; Gross and Walsh, 1980; Medrich, 1982; Webster, 1983).

Household - media. It indicates the ownership of technologies such as media devices. Van Dyck *et al.* (2011) considered the number of computers and televisions, as well as the size of the largest TV set, as

home-environmental factors. The study found a positive association between the number of computers at home and media use. Rideout *et al.* (2010) pointed out that the type of media available at home also influences the amount and the nature of media use. In this way, the ownership of media devices has a close relationship with the media consumed in the surrounding environment of individuals in everyday life, and can be used to predict not only media use but also media multi-tasking behaviors (Brasel and Gips, 2011; Foehr, 2006; Kononova and Chiang, 2015).

Ⅳ. Method

4.1 Study Design

The variables applied in this study are of two levels: household (level 2) and individual (level 1, the lowest level). The hierarchical linear model (HLM) can be used to analyze multilevel data and separate the influences of individuals and households into dependent variables at an individual level. Thus, we used the HLM to handle the multilevel approach, considering variables with different levels of hierarchy (individual and household levels) simultaneously.

4.2 Data Collection

We used data from the Korea Information Society Development Institute. By visiting various households and conducting pencil and paper interviews with household members through its "Korea Media Panel," the institute provides statistics on broadcast and new media types in Korea by collecting data measuring cross-media use behaviors in both multimedia and multi-device environments. This survey has been conducted annually since 2010. Samples are extracted from a two-stage stratified probability proportional to

the size of the systematic sampling by considering administrative districts and households based on population and housing censuses as a nationwide sampling framework. Therefore, it is reasonable to say that the collected sample represents total population in South Korea. Moreover, taking into account the estimated five billion people with mobile devices around the world, South Korea had the highest smartphone penetration in the world at 95 percent in 2018, and mobile phone use was nearly ubiquitous (Pew Research Center, 2019). Thus, our data setting is appropriate to examine media user's content usage patterns. Our data setting is also appropriate in terms of household level analysis. In the U.S., it took 42 years for the single-person households ratio to increase by 9.6% in 42 years from 17.1% in 1970 to 26.7% in 2012 (Vespa *et al.*, 2013). Meanwhile, single-person household ratio in South Korea has been increased by 17% in 25 years (Park and Choi, 2015). According to an official from the National Statistical Office in an article, "The increase in single-person households in Korean society is already a long-term trend." (Kim, 2015). Therefore, a study taking into account household level in South Korea is meaningful and will provide a significant finding to other countries including the US.

Since the institute encourages interdisciplinary research using their survey data, previous studies have been conducted using their data. Their dataset provides the amount of expenditure and subscriptions of various types of media at the individual and household levels, and is thus an appropriate focus of the present study regarding the effects of audience/media factors at the individual/household level. In this study, we used data collected from 10,172 individuals within 4,313 households from a period of June to July 2014. The information of the respondents is provided in <Table 1>.

〈Table 1〉 Information of the Respondents

Categorical variables			Frequency	Percentage
Individual level (n = 10,172)				
Individual-Audience	Gender	Male	4647	45.7%
		Female	5525	52.3%
	Highest level of education	Preschool	39	0.4%
		Elementary school	2344	23.0%
		Middle school	1225	12.0%
		High school	3420	33.6%
		University	3004	29.5%
		Graduate school	140	1.4%
	Income	No income	4651	45.7%
		< 1000 dollars	1419	14.0%
		1000~2000 dollars	1590	15.6%
		2000~3000 dollars	1298	12.8%
		3000~4000 dollars	721	7.1%
		> 4000 dollars	493	4.8%
Individual-Media	Exposure of online behavior	Community Exposure	1694	16.7%
		Community Non-exposure	8478	83.3%
		Blog Exposure	1431	14.1%
		Blog Non-exposure	8741	85.9%
		SNS Exposure	3546	34.9%
		SNS Non-exposure	6626	65.1%
		Cloud service Exposure	799	7.9%
		Cloud service Non-exposure	9373	92.1%
	Multi-screen service usage	Multi-screen (focused on video content) Exposure	82	0.8%
		Non-exposure	10090	99.2%
Household level (n = 4313)				
Household-Audience	Household type	Single household	681	15.8%
		One generation (husband and wife)	869	20.1%
		Two generations (parents and children)	2237	51.9%
		Three generations (grandparents, parents, and children)	224	5.2%
		Other	302	7.0%
	Household income	< 2000 dollars	1516	35.1%
		2000~4000 dollars	1688	39.1%
		4000~6000 dollars	828	19.2%
		> 6000 dollars	281	6.6%

Continuous variables			Mean	Std.Dev.	Min	Max
Individual-Dependent variable	Expenditure of digital content purchases (dollar)		1.21	5.67	0	162
Individual-Audience	Age		44.99	20.86	6	104
Individual-Media	Non-digital content consumption	Theater (dollar)	6.82	14.05	0	350
		Concert (dollar)	4.20	32.07	0	2000
Household‐Audience	Household size		2.94	1.30	1	9
Household-Media	Media ownership variables	# of TVs	1.26	0.51	0	4
		# of game consoles	0.10	0.40	0	7
		# of desktop computers	0.66	0.54	0	3
		# of laptops	0.24	0.49	0	4
		# of tablets	0.04	0.22	0	2
		# of wireless routers	0.32	0.47	0	2

4.3 Measurement

4.3.1 Dependent Variables

Because the purpose of this study is to find the factors that influence the purchasing of digital content, based on the research question, we defined the dependent variables as expenditure with regard to digital content consumption. This measure is generated using the total sum of the expenditures of multi-screens, newspapers/magazines/books, movies/videos, TV programs, music, games, and applications through such media as the smartphone of individual users.

4.3.2 Independent Variables

According to the integrated perspective used in this study, we suggest using independent variables based on two axes: the audience/media factors and individual/household levels. We defined the variables based on the data provided.

Individual-audience variables contain socio-demographic attributes such as age, gender, income, and educational level. The age variable uses the number as is, whereas gender is coded into dummy variables (male = 1, female = 0). Income (monthly) is coded at an ordinal scale from no income = 1 to > 8,000 dollars = 18. Finally, educational level is coded based on the highest level of education, from preschool = 1, to graduate school = 6.

Household-audience variables contain the household size, income, and type. Household size uses the number of family members. Household income is coded at the ordinal scale based on monthly household income, from < 500 dollars =

1 to > 10 million dollars = 22. Household type is coded by dummy variables. Because it consists of five types: single households, single-generation (husband and wife) households, two-generation (parents and children) households, three-generation (grandparents, parents, and children) households, and other household types, we generated four dummy variables.

Individual-media variables contain media exposure as the media accessibility. Among the various services, we used multi-screen services, cloud services, blogs, SNSs, and online communities as media exposure variables. We coded these individual-media variables as dummy variables based on whether an individual is exposed to each service or not. Along with these digital services, we employed non-digital services and media services that does not involve network connection and require certain space for content consumption such as theater or museum. As non-digital services, we included theater and concert going. We measured these variables by the total amount of money expended for each activity. Although non-digital services are not limited to these two services, since theater and concert going occupy majority of total expenditure for non-digital content in South Korea, we employed these two for non-digital content variables (Shin *et al.*, 2014).

Household-media variables contain the media device ownership of the household, such as TVs, computers, game consoles, and wireless routers. We coded the media ownership variables into the numbers of each media device owned.

The variables of the research model are summarized in <Table 2>.

〈Table 2〉 Summary of Variables

Dependent variable			
Expenditure of digital content purchases	Total sum of expenditure of multi-screens, newspapers/magazines/books, movies/videos, TV programs, music, games, and applications through individual media (in dollars)		
Individual-level variables			
Individual-Audience	Gender		Male = 1, Female = 0
	Age		Age as - is
	Education		Highest level of education (ordinal scale)
	Income		Amount of monthly income (ordinal scale)
Individual-Media	Non-digital content consumption	Theater	Total expenditure for movies at theater (dollars)
		Concert (performance)	Total expenditure for concerts (dollars)
	Exposure of online behavior	Community	Exposure = 1, non-exposure = 0
		Blog	Exposure = 1, non- exposure = 0
		SNS	Exposure = 1, non- exposure = 0
		Cloud service	Exposure = 1, non- exposure = 0
	Multi-screen service usage	Multi-screen (focused on video content)	Exposure = 1, non- exposure = 0
Household-level variables			
Household-Audience	Household size		Number of family members
	Single household		Single household = 1, other = 0
	One generation		One generation (husband and wife) = 1, other = 0
	Two generations		Two generations (parents and children) = 1, other = 0
	Three generations		Three generations(grandparents, parents, and children) = 1, other = 0
	Household income		Amount of household monthly income (ordinal scale)
Household-Media	Media ownership variables	# of TVs	Number of televisions in household
		# of game consoles	Number of game consoles in household
		# of desktop computers	Number of desktop computers in household
		# of laptops	Number of laptop computers in household
		# of tablets	Number of tablets in household
		# of wireless routers	Number of wireless routers in household

Ⅴ. Analysis Results

We used HLM 7.01 to test the multilevel research model. To reduce the possibility of multicollinearity, we applied a grand mean centering on all continuous predictors prior to conducting the analysis, but left binary variables (e.g., exposure, generation) uncentered. In addition, we utilized the intercepts-as-outcomes model to investigate the effects of the household level variables (Hofmann *et al.*, 2000). The following equation describes our research model.

$$DigitalContentConsumption_{ij}$$
$$= \alpha + \beta \times IndividualFactors_{ij}$$
$$+ \gamma \times HouseholdFactors_j + \delta_j + \epsilon_{ij}$$

where $DigitalContentConsumption_{ij}$ is the expenditure of digital content consumption of individual i within household j. $IndividualFactors_{ij}$ is a vector of individual-level variables including audience and media factors of individual i within household j. $HouseholdFactors_j$ is a vector of household-level variables including audience and media factors of household j. α denotes an intercept variable. δ_j and ϵ_{ij} are variance components of household level and individual level, respectively. The results are shown in <Table 3>.

For individual-audience factors, gender and education level were shown to be significant (γ = 0.391, t = 2.991, and γ = 0.160, t = 3.130, respectively), whereas income was indicated to be insignificant (γ = -0.012, t = -0.455). According to the results, males (coded as 1) spend more on digital content consumption than females, and people purchase digital content more as their education level increases. Because the effect of age is marginal (γ = -0.005, t = -1.757), younger people might consume more digital content than older people.

Among household-audience variables, people within two generations (parents and children) spend marginally less on digital content purchases than people within other types of households (γ = -0.402, t = -1.671). However, household size and income were both shown to be insignificant (γ = -0.105, t = -0.986, and γ = 0.013, t = 0.428, respectively).

In the case of individual media variables, the exposure of online behavior variables including blogs, SNSs, cloud services, and online communities were all shown to be significant (γ = 0.659, t = -2.431; γ = 0.468, t = 2.804; γ = 1.689, t = 4.328 and γ = 0.554, t = 2.331, respectively). People with experience regarding online behaviors engage more in digital content purchasing than people without such experiences. In addition, multi-screen services usage has a significant effect on individual digital content expenditures (γ = 12.765, t = 5.335). Related with non-digital content consumption, people who spend more on watching movies in the theater purchase digital content more than others (γ = 0.027, t = 4.219), whereas concert viewing is not associated with digital content purchases (γ = 0.004, t = 1.042).

People purchase more digital content in households with more laptops and wireless routers (γ = 0.559, t = 3.091, and γ = 0.377, t = 2.048, respectively), and marginally more in households with tablets (γ = 0.779, t = 1.770). However, the numbers of TVs, game consoles, and desktop computers in the household have an insignificant effect on digital content purchases (γ = 0.143, t = 0.961; γ = 0.042, t = 0.160; and γ = -0.056, t = -0.333, respectively).

〈Table 3〉 Results of Total Expenditure of Digital Content Purchases Using Hierarchical Linear Modeling

Variables	Model 1		Model 2	
	Coef.	SE	Coef.	SE
Individual-level variables				
Individual-audience variables				
Gender, γ_{10}	0.326[*]	0.126	0.391[**]	0.131
Age, γ_{20}	-0.005[*]	0.002	-0.005[†]	0.003
Education, γ_{30}	0.176[***]	0.045	0.160[**]	0.051
Income, γ_{40}	0.002	0.026	-0.012	0.027
Individual-media variables				
Theater, γ_{50}	0.029[***]	0.006	0.027[***]	0.006
Concert, γ_{60}	0.005	0.004	0.004	0.004
Community, γ_{70}	0.652[**]	0.246	0.554[*]	0.238
Blog, γ_{80}	0.626[*]	0.271	0.659[*]	0.271
SNSs, γ_{90}	0.494[**]	0.167	0.468[**]	0.167
Cloud, γ_{100}	1.794[***]	0.398	1.689[***]	0.390
Multi-screen, γ_{110}	13.024[***]	2.444	12.765[***]	2.393
Household-level variable				
Household-audience variables				
Household size, γ_{01}			-0.105	0.106
Single household, γ_{02}			-0.100	0.297
One generation, γ_{03}			-0.241	0.222
Two generations, γ_{04}			-0.402[†]	0.240
Three generations, γ_{05}			0.113	0.393
Household income, γ_{06}			0.013	0.030
Household-media variables				
# of TVs, γ_{07}			0.143	0.149
# of Game consoles, γ_{08}			0.042	0.264
# of Desktops, γ_{09}			-0.056	0.167
# of Laptops, γ_{010}			0.559[**]	0.181
# of Tablets, γ_{011}			0.779[†]	0.440
# of Routers, γ_{012}			0.377[*]	0.184
Intercept, γ_{00}	7.570[***]	0.829	7.440[***]	0.827

Random Effect	Std. dev	Var. comp.	chi-2	p	Std. dev	Var. comp.	chi-2	p
INTRCPT1, u_0	1.667	2.779	4749.4	<0.001	1.609	2.589	4652.8	<0.001
level-1, r	5.085	25.86			5.085	25.85		
Deviance	62947.52				62902.38			

Note: Deviance is a measure of model fit; it equals to -2×log-likelihood of a maximum likelihood estimate (Bryk and Raudenbush, 1992). A smaller model deviance indicates a better fit.
[†] $p<0.1$, [*] $p<0.05$, [**] $p<0.01$, [***] $p<0.001$.

Ⅵ. Discussion

This study examined media use behavior of individuals toward paid digital content. Based on the data of approximately 10,000 individuals within 4,000 households, hierarchical linear modeling was employed to identify the factors influencing digital content expenditure. To do this, we describe the audience and media variables according to a theoretical framework adopted from Webster *et al.* (2000). In addition, to analyze the impact of the household on the purchasing of digital content, this study used two-level variables, namely, the household (level 2) and individual (level 1, the lowest level).

At the individual level, the results show that both the audience and the media factor affect the purchasing of digital content. People with higher education more purchase digital content, and male purchase more than female. However, the influence of the media factor is greater than audience factor. Specifically, multi-screen variables, and all variables related to exposure of online behavior, affect the purchasing of digital content. In addition, in-theater movie consumption has also positive effect on digital content purchases. This indicates that the media factor as experience with online behavior and non-digital content consumption can increase familiarity and lower the hurdle regarding the purchasing of digital content.

Similarly, the effects of media factor are also greater than those of audience variables at the household level. While the household type, which is related to audience variables, marginally affects the paying of digital content, the number of laptops, wireless routers, and tablets in the home positively influence digital content purchasing. The results also show that household level variables as media environments have effects on the digital content consumption of individuals in addition to the dominant effect of individual level variables.

6.1 Theoretical Implications

The findings can provide several theoretical implications. First, this study contributes to the literature by considering multilevel variables (individual and household levels) and media use model (audience and media factors) suggested by Webster *et al.* (2000). Previous studies used individual data to focus on an individual's media use or purchasing behavior of digital content. However, household attributes are not discrete variables within the media (Gentile and Walsh, 2002), and research based only on individual data may be limited in that it ignores the media environment from the household. The nature of media environment and the increase of single-person households (Ley *et al.*, 2014; Yeung and Cheung, 2015) indicate the necessity to understand household attributes, which has been lacking to provide a comprehensive image of digital content purchases of individuals. In addition, although previous studies have argued for a shift toward more individualized media (Wartella and Jennings, 2001), the results indicate that household variables are still important factors in understanding the media use of individuals. In this way, this study shed light on the household-level attributes to digital content purchasing.

Moreover, the results of this study cover media and audience variables that influence the purchasing of digital content. Most prior studies on digital content have focused on factors influencing consumer behaviors based on a user-centric model (Dou, 2004; Wang *et al.*, 2005). Such studies have found that consumer perception of convenience, essentiality, and added value affect purchasing behaviors. In contrast, the results of this study verify that media variables at the individual level, such as exposure to online behaviors and multi-screen, have stronger effects on the purchasing of digital content than audience factors. Additionally, both audience and media factors related to media habits

showed positive effects on digital content purchases. Considering these two axes (individual/household level; media/audience factor) simultaneously, this study provides a larger understanding of individuals' media use behaviors to scholars and calls for future research on it. Additionally, our research model is analyzed with a large data set. Using our dataset, we can provide more generalized findings and implications.

Second, we demonstrate that a multi-screen environment influences the use of paid content services. Because of changes from the use of multiple media devices, many studies on media use behaviors have considered multi-screen service as a major factor (Nee and Dozier, 2017; Shin and Biocca, 2017). The results of this study also support the findings of previous studies emphasizing the importance of multi-screen on media use (Brasel and Gips, 2011; Kwon *et al.*, 2015). However, in contrast to previous studies typically focusing on the multi-screen context, the findings of this study reveal the impact of multi-screen service use as a media factor influencing the purchasing of digital content. This study suggests that a multi-screen environment as a media factor is more important than the other variables in understanding the consumer's behavior toward the purchasing of digital content.

6.2 Practical Implications

Because the revenue models of the content industry are growing rapidly and given their importance in the sustained growth of media firms, there is a need to better understand customers' digital content purchasing behavior. As previously noted, firms can increase their profits by understanding the purchasing behaviors of their customers. However, although media use has a close relationship with household characteristics and the environment, previous studies have examined consumer behaviors at only the individual level. Since

the results are based on two-level variables, they are expected to be more useful to content providers with regard to practical applications to attract customers. For example, the results of this study indicate that the ownership of media devices including laptops, tablets, and wireless routers as household-level variables have positive influences on the purchasing of digital content. Customers who have multiple media devices at home are more likely to purchase digital content. Therefore, firms can increase their profits by providing devices at a cheaper price, such as through rental services.

In addition, previous studies have focused primarily on the application of audience factors, such as the perceived value and demographic variables of the users, which have been lacking for content providers to understand and predict customer behavior. In this regard, this study provides new insight into media factors toward the purchasing of digital content. According to the results, exposure to online behaviors and multi-screen service usage in the individual level variables showed the strongest effects on the use of purchased digital content, suggesting that the media factor at the individual level has a considerable influence on the purchasing behavior regarding such content. When viewed from a managerial perspective, the best way to encourage users to purchase digital content is to induce them to use multi-screen services. Compared to cases in which content is consumed using a single device, by allowing consumers to use various devices, or through a lowering in cost, exposure to multi-screen services by consumers can be increased. Content providers will be able to increase content sales by establishing special promotional strategies to attract customers who frequently use multi-screen services. In addition to considering multi-screen environments in the development and distribution of content, content providers should implement strategies to attract users who are

active in terms of multi-screen service subscription.

6.3 Future Research Opportunities

This study has certain limitations. Although our dataset was collected in 2014, the year is the time for actively progressing of the development of multi-screen technology and the over the top (OTT) service environment. At that time, the concept of the multi-screen was popularized and various contents and service using the multi-screen were expanded, for example, MWC (Mobile World Congress) pays attention to multi-screen as one of the major issues (MWC, 2014). As our findings were based on the sample in the period of expansion of multi-screen, we think that the discussion is meaningful nowadays that people have more and various devices and use the multi-screen more generally. Nevertheless, as there is a still time gap, future research with recent dataset can reconfirm our findings or provide the deeper understanding of individuals' media use, especially the multi-screen usage. Moreover, as the analysis employed data from a survey, we were unable to collect variables related to the perceived value of users toward digital content. Combined with previous findings based on a perceived value framework and the findings of the present study, future researches can provide a more integrated understanding of a user's digital content consumption. In addition, this study will open the door to research employing both individual- and household-level variables for digital content consumption. Future research should expand upon and reconfirm our findings. For example, this study was unable to conduct a cross-level interaction despite using multilevel variables, such as the individual and household levels. To gain a broader theoretical understanding of the media use of consumers, in further research, scholars should identify the cross-level interactions that may influence the purchasing of digital content.

References

[1] Barletta, M., *Marketing to Women: How to Understand, Reach, and Increase Your Share of the World's Largest Market Segment*, Chicago, IL: Dearborn Trade Publishing, 2003.

[2] Bhattacharjee, S., R. D. Gopal, J. R. Marsden, and R. Sankaranarayanan, "Digital goods and markets: Emerging issues and challenges", *ACM Transactions on Management Information Systems (TMIS)*, Vol.2 No.2, 2011.

[3] Boudreau, K. and M. Consalvo, "Families and social network games", *Information, Communication & Society*, Vol.17 No.9, 2014, pp. 1118-1130.

[4] Brasel, S. A. and J. Gips, "Media multitasking behavior: Concurrent television and computer usage", *Cyberpsychology, Behavior, and Social Networking*, Vol.14 No.9, 2011, pp. 527-534.

[5] Brause, S. R. and G. Blank, "Externalized domestication: Smart speaker assistants, networks and domestication theory", *Information, Communication & Society*, Vol.23 No.5, 2020, pp. 751-763.

[6] Brown, J. D., K. W. Childers, K. E. Bauman, and G. G. Koch, "The influence of new media and family structure on young adolescents' television and radio use", *Communication Research*, Vol.17 No.1, 1990, pp. 65-82.

[7] Bryk, A. S. and S. W. Raudenbush, *Hierarchical Linear Models for Social and Behavioral Research: Applications and Data Analysis Methods*, Newbury Park, CA: Sage. 1992.

[8] Chen, Y., J. Wen, and B. Xie, ""I communicate with my children in the game": Mediated intergenerational family relationships through a social networking game", *The Journal of Community*

Informatics, Vol.8 No.1, 2012.

[9] Comstock, G. and E. Scharrer, The use of television and other film-related media. In D. G. Singer & J. L. Singer (Eds.), *Handbook of children and the media* (pp. 47-72), Thousand Oaks, CA: Sage. 2001.

[10] Comstock, G. and E. Scharrer, *Television: What's on, Who's Watching, and What it Means*, San Diego, CA: Academic Press, 1999.

[11] Correa, T., A. W. Hinsley, and H. G. De Zuniga, "Who interacts on the Web?: The intersection of users' personality and social media use", *Computers in Human Behavior*, Vol.26 No.2, 2010, pp. 247-253.

[12] Coyne, S. M., H. G. Holmgren, S. L. Keenan-Kroff, S. Petersen, and L. Stockdale, "Prenatal predictors of media use during infancy", *Cyberpsychology, Behavior, and Social Networking*, Vol.23 No.6, 2020, pp. 377-383.

[13] Deuze, M., "Media life", *Media, Culture & Society*, Vol.33 No.1, 2011, pp. 137-148.

[14] Doong, H. S., H. C. Wang, and G. R. Foxall, "An investigation of consumers' webstore shopping: A view of click-and-mortar company", *International Journal of Information Management*, Vol.31 No.3, 2011, pp. 210-216.

[15] Dou, W., "Will internet users pay for online content?", *Journal of Advertising Research*, Vol.44 No.4, 2004, pp. 349-359.

[16] Dutta-Bergman, M. J., "Complementarity in consumption of news types across traditional and new media", *Journal of Broadcasting & Electronic Media*, Vol.48 No.1, 2004, pp. 41-60.

[17] Foehr, U. G., "Media multitasking among American youth: Prevalence, predictors and pairings", Available at https://eric.ed.gov/?id=ED527858, 2006.

[18] Gentile, D. A. and D. A. Walsh, "A normative study of family media habits", *Journal of Applied Developmental Psychology*, Vol.23 No.2, 2002, pp. 157-178.

[19] Goldman, D., "Consumer republic: Yahoo! surrendered: Porn site is out; so is free choice [Eastern edition]", *Adweek*, Vol.42 No.17, 2001, p. 12.

[20] Gross, L. S. and R. P. Walsh, "Factors affecting parental control over children's television viewing: A pilot study", *Journal of Broadcasting & Electronic Media*, Vol.24 No.3, 1980, pp. 411-419.

[21] Hamari, J., K. Alha, S. Järvelä, J. M. Kivikangas, J. Koivisto, and J. Paavilainen, "Why do players buy in-game content? An empirical study on concrete purchase motivations", *Computers in Human Behavior*, Vol.68, 2017, pp. 538-546.

[22] Hartmann, T., *Media Choice: A Theoretical and Empirical Overview*, London: Routledge, 2009.

[23] Hess, M., *Video Consumer Mapping Study*, Muncie, IN: Ballstate University Sequent Partners, 2009.

[24] Ho, J. Y. and M. Dempsey, "Viral marketing: Motivations to forward online content", *Journal of Business Research*, Vol.63 No.9, 2010, pp. 1000-1006.

[25] Hofmann, D. A., M. A. Griffin, and M. B. Gavin, "The application of hierarchical linear modeling to organizational research", In K. K. J. and K. S. W. J. (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 467-511), San Francisco, CA: Wiley, 2000.

[26] Horng, S. M., Y. Y. Lee, and C. L. Wu, "A study of the paying behavior for subscribing social network sites", *Computer Communications*, Vol.73, 2016, pp. 282-290.

[27] Howard, P. N. and A. Massanari, "Learning to search and searching to learn: Income, education, and experience online", *Journal of Computer-*

Mediated Communication, Vol.12, No.3, 2007, pp. 846-865.

[28] Jagtiani, M. R., Y. Kelly, D. Fancourt, N. Shelton, and S. Scholes, "# StateOfMind: Family meal frequency moderates the association between time on social networking sites and well-being among UK young adults", *Cyberpsychology, Behavior, and Social Networking*, Vol.22, No.12, 2019, pp. 753-760.

[29] Khan, M. L., "Social media engagement: What motivates user participation and consumption on YouTube?", *Computers in Human Behavior*, Vol.66, 2017, pp. 236-247.

[30] Kim, Y., "Single-person houshold, Changes the concept of business", Economy Insight, 2015, Available at http://www.economyinsight.co.kr/news/articleView.html?idxno=2696.

[31] Kononova, A. and Y. H. Chiang, "Why do we multitask with media? Predictors of media multitasking among Internet users in the United States and Taiwan", *Computers in Human Behavior*, Vol.50, 2015, pp. 31-41.

[32] Kwon, B. R., S. Ryu, and Y. G. Kim, "Identifying factors affecting behavioral intent of potential and existing n-screen service users", *ETRI Journal*, Vol.37, No.2, 2015, pp. 417-427.

[33] Lee, S. J. and Y. G. Chae, "Children's Internet use in a family context: Influence on family relationships and parental mediation", *Cyberpsychology & Behavior*, Vol.10, No.5, 2007, pp. 640-644.

[34] Leung, L. and R. Wei, "More than just talk on the move: Uses and gratifications of the cellular phone", *Journalism & Mass Communication Quarterly*, Vol.77, No.2, 2000, pp. 308-320.

[35] Ley, B., C. Ogonowski, J. Hess, T. Reichling, L. Wan, and V. Wulf, "Impacts of new technologies on media usage and social behaviour in domestic environments", *Behaviour & Information Technology*, Vol.33, No.8, 2014, pp. 815-828.

[36] Livingstone, S., *Young People and New Media: Childhood and the Changing Media Environment*, London: Sage, 2002.

[37] Lopes, A. B. and D. F. Galletta, "Consumer perceptions and willingness to pay for intrinsically motivated online content", *Journal of Management Information Systems*, Vol.23, No.2, 2006, pp. 203-231.

[38] Matthews, T., K. Liao, A. Turner, M. Berkovich, R. Reeder, and S. Consolvo, "She'll just grab any device that's closer": A study of everyday device & account sharing in households", *Paper presented at the Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, San Jose, California, USA, 2016.

[39] Medrich, E. A., *The Serious Business of Growing Up: A Study of Children's Lives Outside School*, Berkeley: University of California Press, 1982.

[40] MWC, "MWC14 keynote panel: The battle for the multi-screen home", 2014, Available at https://www.mobileworldlive.com/on-stage/mwc/mwc14-keynote-panel-battle-multi-screen-home.

[41] Nee, R. C. and D. M. Dozier, "Second screen effects: Linking multi-screen media use to television engagement and incidental learning", *Convergence*, Vol.23, No.2, 2017, pp. 214-226.

[42] Park, H. and J. Choi, "Long-term trends in living alone among Korean adults: Age, gender, and educational differences", *Demographic Research*, Vol.32, 2015, pp. 1177-1208.

[43] Peled, Y., "Children's attitudes to parental mediation in a traditional society", *Cyberpsychology, Behavior, and Social Networking*, Vol.21, No.12, 2018, pp. 774-780.

[44] Pew Research Center, "Spring 2018 Global Attitudes Survey", Available at https://www.pewresearch.o

rg/global/2019/03/04/u-s-german-relations-meth odology-spring-2018-global-attitudes-survey/, 2 019.

[45] PQMedia, "Global Consumer Spending on Media Content & Technology Forecast 2019-23", 2020, Available at https://www.pqmedia.com/prod- uct/global-consumer-spending-on-media-con- tent-technology-forecast-2019-23/.

[46] Prasad, A., V. Mahajan, and B. Bronnenberg, "Advertising versus pay-per-view in electronic media", *International Journal of Research in Marketing*, Vol.20, No.1, 2003, pp. 13-30.

[47] PWC, "Global entertainment & media outlook 2019-2023", 2019, Available at https://www.pwc. com/gx/en/entertainment-media/outlook-2019/e ntertainment-and-media-outlook-perspectives-2 019-2023.pdf.

[48] Rideout, V. J., U. G. Foehr, and D. F. Roberts, *Generation M^2: Media in the Lives of 8-to 18-Year-Olds*, Menlo Park, CA: ERIC Clearin- ghouse, 2010.

[49] Ruiz Mafe, C., and S. Sanz Blas, "Explaining internet dependency", *Internet Research*, Vol.16, No.4, 2006, pp. 380-397.

[50] Shin, D. H. and F. Biocca, "Explicating user be- havior toward multi-screen adoption and dif- fusion: User experience in the multi-screen media ecology", *Internet Research*, Vol.27 No.2, 2017, pp. 338-361.

[51] Shin, J., Y. Kim, H. Ha, B., Cha, and M. Kim, *2014 Korea Media Panel Survey*, 2014.

[52] Snell, K., "The rise of living alone and loneliness in history", *Social History*, Vol.42, No.1, 2017, pp. 2-28.

[53] Song, J., J. Baker, S. Lee, and J. C. Wetherbe, "Examining online consumers' behavior: A serv- ice-oriented view", *International Journal of Information Management*, Vol.32, No.3, 2012,

pp. 221-231.

[54] Steiner, P. O., "Program patterns and preferences, and the workability of competition in radio broad- casting", *Quarterly Journal of Economics*, Vol.66, No.2, 1952, pp. 194-223.

[55] Taylor, C., "Fighting way to paid model", *Adverti- sing Age*, Vol.72, No.31, 2001, pp. 34-35.

[56] Udo, G. J., K. K. Bagchi, and P. J. Kirs, "An assessment of customers'e-service quality percep- tion, satisfaction and intention", *International Journal of Information Management*, Vol.30, No.6, 2010, pp. 481-492.

[57] Van Dyck, D., G. Cardon, B. Deforche, N. Owen, K. De Cocker, K. Wijndaele, and I. De Bourdeaud- huij, "Socio-demographic, psychosocial and home-environmental attributes associated with adults' domestic screen time", *BMC Public Health*, Vol.11, No.1, 2011, p. 668.

[58] Van Rees, K. and K. Van Eijck, "Media repertoires of selective audiences: The impact of status, gen- der, and age on media use", *Poetics*, Vol.31, No.5-6, 2003, pp. 465-490.

[59] Vespa, J., J. M. Lewis, and R. M. Kreider, "America's families and living arrangements: 2012", *Current Population Reports*, Vol.20, No.2013, 2013, p. 570.

[60] Wang, C. L., Y. Zhang, L. R. Ye, and D. D. Nguyen, "Subscription to fee-based online serv- ices: What makes consumer pay for online con- tent?", *Journal of Electronic Commerce Research*, Vol.6, No.4, 2005, pp. 304-311.

[61] Wang, Y. S., C. H. Yeh, and Y. W. Liao, "What drives purchase intention in the context of online content services? The moderating role of ethical self-efficacy for online piracy", *International Journal of Information Management*, Vol.33, No.1, 2013, pp. 199-208.

[62] Wartella, E. and N. Jennings, "New members

of the family: The digital revolution in the home", *Journal of Family Communication*, Vol.1, No.1, 2001, pp. 59-69.

[63] Webster, J. G., "The impact of cable and pay cable television on local station audiences", *Journal of Broadcasting & Electronic Media*, Vol.27, No.2, 1983, pp. 119-125.

[64] Webster, J., P. Phalen, and L. Lichty, *Ratings analysis: Theory and practice of audience research*, Mahwah, NJ: Lawrence Erlbaum Associates, 2000.

[65] Woodard, E. H. and N. Gridina, *Media in the Home*, Retrieved from Philadelphia, PA, 2000

[66] Ye, L. R., Y. J. Zhang, D. D. Nguyen, and J. Chiu, "Fee-based online services: Exploring consumers' willingness to Pay", *Journal of Technology and Information Management*, Vol.13 No.2, 2004, pp. 134-141.

[67] Yeung, W. J. J. and A. K. L. Cheung, "Living alone: One-person households in Asia", *Demographic Research*, Vol.32, 2015, pp. 1099-1112.

[68] Zillmann, D. and P. Vorderer, *Media Entertainment: The Psychology of Its Appeal*, Mahwah, NJ: Erlbaum, 2000.

Audience and Media Predictors for Digital Content Purchases: A Multilevel Approach

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Abstract

Previous studies on willingness to pay for digital content have mainly focused on audience factors and individual level. To complement the limitation of previous research, this study conducts a multi-level analysis to find the factors influence digital content purchases considering two axes: audience/media factors and individual/household levels. Using a sample of 10,172 individuals within 4,313 households, the analysis results show individual media factors including theater-going, experience with cloud services, and multi-screen service usage have the greatest effects on digital content purchases. At the household level, the media ownership factors that the number of laptops, wireless routers, and tablets have a greater influence than audience factors such as household size or household income. Our findings help scholars to enhance the understanding of individuals' media use considering household environmental factors and shed light on the importance of multi-screen service usage, and content providers to improve their digital content sales using multi-screen environment.

Keywords: Audience Factor, Media Factor, Individual Level, Household Level, Digital Content Purchases, Multilevel Approach

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KAIST 경영대학 박사과정에 재학 중이다. 주요 관심분야는 프라이버시, 정보 보안, 공유 경제, 정보 시스템의 사회적 효과 및 비즈니스 애널리틱스 등이다. 지금까지 Decision Support System, Security Journal 등 주요 학술지에 논문을 발표하였다.

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현재 한국기술교육대학교 산업경영학부 조교수로 재직 중이다. KAIST 경영대학 에서 박사 취득 후 중국과학기술대학 조교수를 역임하였다. 주요 관심분야는 collective dynamics and human behaviors in IS 이다. International Journal of Information Management, Communications of the ACM 등 주요 저널에 논문을 발표하였다.