



Article

Effective Strategies for Contents Recommendation Based on Psychological Ownership of over the Top Services in Cyberspace

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Abstract: With the advanced development of IT, people are spending an increasing amount of time in the cyberspace and perceive psychological ownership of intangible objects (e.g., e-books, avatars, online movie streaming services), which they come to regard as “theirs”. This study focuses on users’ psychological ownership of OTT (over the top) services, which have recently received much attention, and investigates how service providers can present recommendation information more effectively when recommending content to users. This study, based on psychological ownership theory, specifically attempts to verify which method of recommending information is effective in correlation to the level of psychological ownership that a user feels about an online service. Additionally, this study presents this effect in terms of psychological distance, which we argue is the underlying mechanism of psychological ownership. Watcha, one of South Korea’s OTT services, was employed as the experimental subject in this study, and a scenario-based test was conducted. In conclusion, this study found that for users with high psychological ownership of online services, a recommendation information message based on objective and concrete information about a movie was more effective, whereas for users with low psychological ownership, abstractly expressed messages were more effective. Furthermore, by applying a moderated mediation model, this study confirmed that psychological distance mediated the results stated above.

Keywords: psychological ownership; OTT service; psychological distance; contents recommendation; construal level theory



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1. Introduction

Due to the prolonged COVID-19 pandemic outbreak, outdoor activities have been restricted, and the amount of time people spend inside their homes has relatively increased. These changes in daily routines have rapidly increased the demand for content to be consumed for leisure indoors, and thus the market for “over the top” (OTT) services (e.g., Amazon Prime, Netflix, Watcha), which can be enjoyed without time and place restrictions, has been growing significantly. “OTT service” refers to a service that provides various media contents such as movies, drama series, and educational programs through the internet [1]. Although OTT users can search for the content they want, they may suffer from content overload because of the overwhelming amount of content available in the service. Therefore, OTT services adopt a method of recommending contents to users, presenting movies with thumbnails from the video, for example, to induce users to watch the content. At this point, the attitudes and behaviors of consumers may end up varying depending on how the recommendation information is presented to the user [2,3]. In this regard, it ought to be possible to identify a method of providing the most persuasive information to the consumers, reflecting their situation or tendencies.

On the other hand, the recommendation system relieves the phenomenon of information overload by providing the data and information that a user really needs, and helps the user effectively select contents (e.g., books, movies, songs) [4,5]. Since numerous content

exists in OTT service, it is becoming increasingly important for service providers to allow consumers to easily and conveniently accept information through a recommendation system. The studies on the recommendation system have mainly focused on the improvement of the prediction rate or the optimization of the algorithm [6]. Interestingly, several recent studies deal with information expression or presentation that maximizes the effectiveness of recommendation systems by using electronic advanced research equipment such as an eye tracker [7]. For example, the study of Sulikowski and Zdziebko [8] suggested that the recommended area layout influences the effect of the recommendation. Specifically, the vertical recommendation area is more effective than the horizontal recommendation area. Similarly, another research tried to evaluate the effective interface of web sites through user eye movements or heat maps [9]. These studies offer the meaningful implications that it is necessary to consider how users can better accept the recommended information or content beyond the prediction rate of the recommendation system.

This study considers the psychological ownership of consumers as an important variable influencing information acquisition. In the academic fields including marketing, business, and psychology, psychological ownership has been regarded as a key concept that can affect consumer attitudes or behaviors [10–14]. Psychological ownership is defined as that state in which individuals feel as though the particular target of ownership (tangible or intangible in nature) or a piece of it is “theirs” (i.e., “It is MINE!”) [15]. Previous studies in these various domains have revealed that psychological ownership toward a particular target can influence information processing of consumers. In particular, recent studies have investigated the role of psychological ownership in the digital world and verified that users experience psychological ownership of intangible targets such as online services and contents [11,16–19]. Furthermore, recent studies have suggested that users’ decision-making can vary depending on the degree of psychological ownership of online services, drawing attention to the role of psychological ownership in the online context [18,20–22].

However, there are still insufficient empirical studies on various categories or specific objects to which psychological ownership is applied in the online context. For instance, Kaplan and Haenlein [23] dealt with six different types of social media (i.e., blogs, social networking sites, collaborative projects, content communities, virtual social worlds, virtual games), and categorized each social media type by the nature of social presence/media richness and self-presentation/self-disclosure. This study indirectly showed that psychological ownership will be applied in various ways depending on the characteristics of online services. Since the characteristics of each online service are diverse, changes in the motivation, formation, and consequences of the psychological ownership may appear differently. In other words, psychological ownership will apply in different ways depending on the object in the online context. Psychological ownership has been studied through various targets such as online music streaming service [11,16], online community [19,24], online game [25], online sharing platform [26,27]. However, it is difficult to find studies that have conducted experiments by adopting Over-the-Top service, which is one of the most actively used online services recently, as the subject of psychological ownership. This study is expected to fill the research gap in that it expands the scope of the psychological ownership object that has been carried out so far and conducts empirical research.

In summary, this study (1) focuses on the relationship between an individual and a target, and aims to verify how one perceives the psychological distance to the target according to one’s psychological ownership of an intangible object, such as an online service (i.e., video streaming service) and (2) will investigate which recommendation strategy is effective when presenting content information, depending on the user’s psychological ownership of online services. Furthermore, we (3) conducted a moderated mediation analysis to identify the relationship between the interaction effect, which consists of psychological ownership and method of recommendations message, and psychological distance in regard to one’s attitude toward content information.

The rest of the paper is organized into the following sections. The next section presents the theoretical background and hypotheses development based on previous literature. After

that, research method that explains the design, participants, procedure, and measurement items is provided. The following section describes the results of the study and the last section present the conclusion including the summary of this research, theoretical/practical implication, and future research directions.

2. Theoretical Background and Hypotheses Development

2.1. Psychological Ownership in Cyberspace

Psychological ownership is defined as the psychological state in which individuals feel ownership toward a particular object or a piece of that object (e.g., “it is mine”), regardless of whether they actually (i.e., legally) own the target or not [15,21,28]. The phenomenon of psychological ownership has been revealed to be relevant for both tangible (e.g., car, photograph, book, MP3 files) and intangible (e.g., digital contents, social media and online music streaming service) objects [16,21,24]. According to Belk [29], the core of ownership state is the feeling of possession and the feeling of being closely tied or connected to the target, which in turn leads to the particular object becoming part of the individual’s extended self [30].

Psychological ownership has recently come into spotlight as a major factor influencing consumers’ attitudes and behaviors in various research fields such as business, marketing, consumer, psychology, and information system [10–12,21,31]. More recently, especially, as the paradigm of ownership gradually changes from tangible objects to intangible objects with the development of IT, the role of users’ psychological ownership in the cyberspace has been noted. For instance, according to Kim, Kim, Jeon, Jun and Kim [24], they investigated the interaction effects between psychological ownership and recognition on intention to share in the online service (e.g., Facebook), and confirmed a greater sense of psychological ownership increased intention to share in online communities. The findings of Lee and Chen [32]’s cross-sectional study demonstrated that strong psychological ownership influenced intention to revisit in virtual world (e.g., Second Life). In addition, it is revealed that psychological possession has a significant effect on usage of access-based service [33], intention to switch [16], OCB toward Airbnb [27], willingness to pay more in social media [21], and social media use [18].

Based on the discussion of previous studies, this study focuses on the implications of two aspects: First, users can have psychological ownership of intangible objects such as online services (e.g., online game, online platform service) and digital content (e.g., images, documents, music, videos). Second, depending on the level of psychological ownership in cyberspace, it can affect the mindset of users, which can change their attitudes and behaviors. To sum up, this study predicts that when a service provider presents content information to over-the-top service users, discriminatory results will be derived according to the level of psychological ownership they feel about the target online service.

2.2. Underlying Mechanism of Psychological Ownership as Psychological Distance

The construal level theory is a comprehensive model of what kind of thinking a person uses in what condition of the various. According to construal level theory, the psychological distance that an individual perceives in relation to the object of decision-making, the environment or context affects the individual’s construal level regarding a specific target, and this may affect variations in the individual’s mindset and decision-making [34,35]. Previous studies, with the change of psychological distance toward the target, have verified that interpretations of objects and events, which affects judgment or preference [34,36,37]. In situations where an individual perceives the target to be closer, the individual will engage in (1) thinking concretely rather than abstractly, (2) thinking about incidental details rather than the essence, and (3) thinking focused on means to achieve a goal rather than focused on the goal itself [34,38].

As expressed in the phrase “you are what you own”, referenced in Belk (2014), one expands one’s ego to encompass the object one owns (i.e., a part of one’s extended self). Many preceding studies have explained the core concept of psychological ownership focusing on

the relationship between oneself and a target [28,29]. For example, psychologically feeling a target to be “my” possessions indicates that one has become psychologically tied to the target, and we can infer that one will then perceive oneself and one’s target to be in closer association [15,39]. In a study by Claus and Warlop [40], an experiment was conducted to verify whether the target one owns feel closer in psychological distance than a target one does not actually own; this study gives clues to the relationship between psychological ownership and psychological distance based on construal level theory [41]. Although in the aforementioned study, the target of testing was limited to physical objects, our study expands this research to digital space, with the expectation that psychological ownership of intangible objects will affect psychological distance. For example, if one develops psychological ownership of an online service, perceiving it to be “my service,” then one will feel more related to and intimate with the online service, and as a result, the psychological distance will become closer. Therefore, this study proposes the following hypothesis.

Hypothesis 1 (H1). *Users with high psychological ownership of an online service will feel that the psychological distance to the online service is closer than users with low psychological ownership.*

2.3. The Effective Strategies for Contents Information Depending on Psychological Ownership

Construal Level Theory (CLT), proposed by Trope and Liberman (2010), is a theory that explains how people’s decision-making and information processing are affected by the psychological distance they perceive about an object or event. In CLT, the level of construal of a target varies depending on the psychological distance; when the psychological distance is close, people engage in low-level construal focused on “how”, that is activated based on concrete and peripheral characteristics. On the other hand, when the psychological distance is greater, high-level construal is performed, focused on abstract and central features [41–43]. This suggests that the characteristics of messages that people will consider important or having a better “fit” may change depending on the psychological distance [44,45]. In this context, users with strong psychological ownership of a target are more likely to think of it as psychologically closer, and their level of construal may be low. In this case, as indicated by construal level theory, the user’s construal will be better suited to a recommending message strategy or stimulus that is consistent with lower-level construal and the user will more actively accept such information. For example, when an OTT service recommends movie information, a message that specifically presents attributes based on objective information regarding the movie will be effective. Inversely, users with low psychological ownership will have a greater sense of psychological distance from the subject, and messages corresponding with higher level construal will be more effective. For example, if one’s psychological ownership of an online service is weak, the online service will likely be unfamiliar, and one may not know much about individual content information or categories. Therefore, such a person will respond better to a message that suggests why one should view the recommended content and presents a broad direction for how to use the content. In other words, for users with weak psychological ownership of online services, a message that abstractly expresses why certain content should be viewed would be more effective. This can be summarized as hypotheses as follows.

Hypothesis 2 (H2). *When presenting content recommendations to users with high psychological ownership of online services, concrete messages will be more effective than abstract messages.*

Hypothesis 3 (H3). *When presenting content recommendations to users with low psychological ownership of online services, abstract messages will be more effective than concrete messages.*

Figure 1 illustrates the conceptual research model to include all three hypotheses. It shows the relationship among psychological ownership, recommendation message, psychological distance, and attitude toward content information.

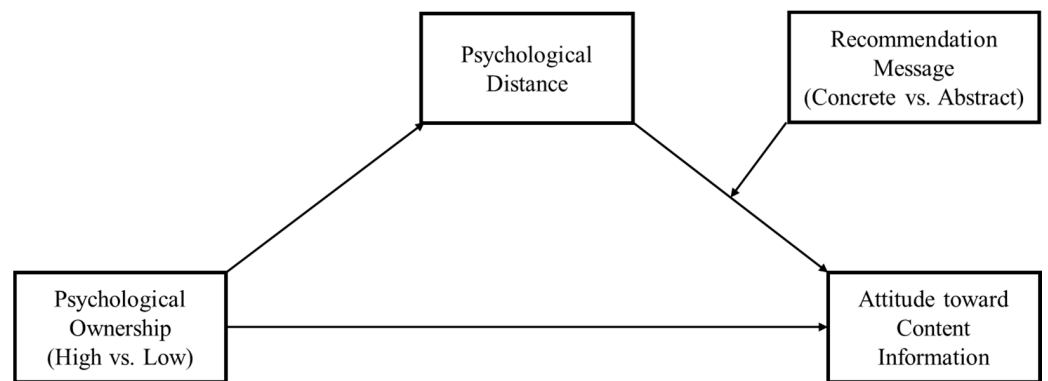


Figure 1. Conceptual research model

3. Research Method

3.1. Design and Participants

We designed an experiment of 2 (Level of psychological ownership: high vs. low) × 2 (Method of recommendation message: concrete vs. abstract) factorial conditions with participants randomly assigned to one of the four conditions (see Figure 2). The experiment was conducted online for two weeks by a major research agency in South Korea. The re-search agency collected the experiment data from its own research panel with the recruitment requirements of 20s to 30s general consumers who had experience using OTT services. Most of them (about 97%) have a service account of OTT services now. As our questionnaire was originally in Korean, we conducted a back-translation procedure to ensure translation validity to English. A hundred-ten participants were responded to the survey of this experiment. One hundred and eight participants completed all procedures in the survey. Therefore, we performed analyses on responses from a total of 108 participants. Their average age was about 24.8 (SD = 3.72) years, and 58 (53.7%) were male. The experimental service was Watcha similar to Netflix, a famous Over-the-Top service in South Korea that provides video content such as movies and dramas, and recommends movies to users. There were two reasons for choosing Watcha as the experiment service: (1) it is the most well-known and preferred OTT service in South Korea, and (2) the service is preferred regardless of age group or gender. That is, we chose Watcha to make our experiment representative.

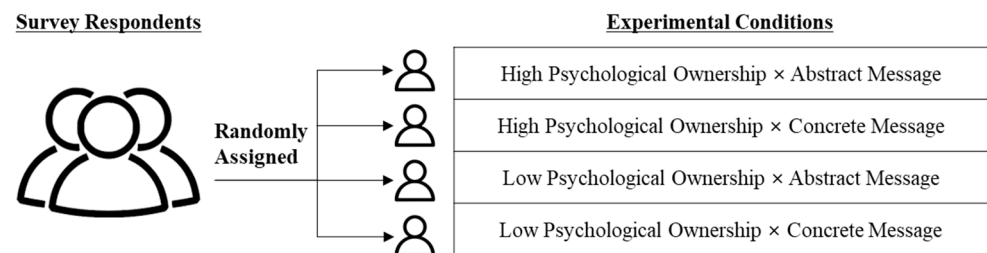


Figure 2. Random assignment to one of the experiment conditions

To control the external variables affecting the experiment conditions, it was investigated whether there was a mean difference of three potential external variables between the four groups by the experimental conditions. First, since how often users use the OTT service can simply influence their attitude toward online services, we controlled the usage frequency, measured by asking participants how often they were using the OTT service. For the same reason, interest in OTT services to watch movies was controlled, measured by asking respondents for usually they like to use online movie watching services. Finally, we have controlled the involvement in the OTT service itself through two measurement items (“OTT service is important part of my life,” “OTT service is highly related to me”). All questions were measured on the 7-point Likert scale (1: strongly disagree, 7: strongly

agree), and as a result, there was no statistically significant difference between all four groups ($F(3, 104) = 2.49, p = 0.07, ns$; $F(3, 104) = 2.34, p = 0.08, ns$; $F(3, 104) = 2.04, p = 0.11, ns$, respectively).

3.2. Procedure

Experimental conditions and manipulations were modified according to the purpose of this study, referring to Kim et al. [24] research. First, participants were asked to assume they would use an online movie streaming service (i.e., OTT service) to watch the movie. Subsequently, a brief description of the 'Watcha' service and the main page screen appeared to the participants. The first part of Appendix A contains a description of 'Watcha' service and the main page screen presented to the participants. Next, along with the login page screen, it was presented to participants that they could log in to the movie streaming service as a premium or guest user. In the second part of Appendix B presents the login page image with description of the two types of user.

Additionally, then, two types of scenario are presented to manipulate the level of the psychological ownership. In the condition of high psychological ownership, it was presented as a premium member who paid 10 USD per month for the service. It was suggested that premium members can use additional functions. For instance, they can freely customize my page, wish list, and review or rate movies. These experimental conditions were produced by focusing on control and investment among the three dimensions that form a sense of psychological ownership [21,24]. On the contrary, in the condition of low psychological ownership, it was presented as a guest user can only use the service for two weeks, free of charge, and are limited in the features they can use. After that, participants were offered content (i.e., movies to be released) while using Watcha service, and a message about recommended content information was presented. Finally, referring to Homer [46] research, a recommendation message (concrete vs. abstract) for content information was presented to the participants according to each condition. As shown in Appendix B, the abstract condition focused on presenting symbolic needs, subjective, and abstract messages to participants (e.g., highlighting the emotions the participants will feel). On contrary, the concrete condition focused on presenting practical needs, objective, and concrete messages to participants (e.g., highlighting the latest technology and explicit numbers).

3.3. Measurement Items

For the purpose of this study, we operationalized the psychological ownership as the psychological state in which users perceive that the online service as "It's my service" based on extant studies [16,17,21]. Psychological ownership was measured on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) using the following three items from Danckwerts and Kenning [16]: "I sense that this video streaming service is MINE", "I feel a high degree of personal ownership for this video streaming service", and "I feel like I own this video streaming service". (Eigenvalue = 2.67, Cronbach's $\alpha = 0.94$). Based on the construal level theory [38], we operationalized the recommendation message as to whether participants perceived recommendation messages concretely or abstractly. For the manipulation check on the recommendation message, participants answered two questions about whether the message was being emphasized in an abstract or concrete way. Specifically, referring to Park [44], to measure the method of recommendation message, we used the following two items using the 7-point semantic differential scale (1 = *more concrete* to 7 = *more abstract*): "This recommendation message emphasizes concrete aspects, such as the technology used to produce a movie" vs. "This recommendation message emphasizes abstract aspects, such as emotions that can be felt through watching a movie" and "This recommendation message concretely describes the information about the movie" vs. "This recommendation message abstractly describes the information about the movie". Lastly, following MacKenzie and Lutz [47], we measured the attitudes toward content information through the items (i.e., like, good, favorable) on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*; Eigenvalue = 2.64, Cronbach's $\alpha = 0.93$).

We have been working on the following five approaches to improve the internal and external validity of the experiment: (1) We selected a familiar service that fits the reality of the experiment target, (2) In order to feel as if participants used the service, the main page and login page of the actual service were presented similarly in the stimulus for the experiment, (3) Measurement items that have been verified in several previous studies were used, (4) In order to increase the generalization of the results, a representative sample from South Korea was selected as an experiment subject, (5) To prevent the confounding effect, control variables were measured and statistically verified.

4. Research Results

4.1. Validity and Reliability

In order to confirm the validity and reliability of the measurements, we conducted the exploratory factor analysis and reliability test (see Table 1). Factor extraction was performed using Principal Component Analysis (CPA), and the method of factor rotation was Varimax with Kaiser Normalization. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.732, above the acceptable value of 0.70 Kaiser [48], and Bartlett’s Test of Sphericity was significant (Approx. Chi-square (45) = 752.219, $p < 0.001$). This result indicates the suitability of factor analysis. As a result of test the reliability of the measurement items, all Cronbach’s alpha coefficients were 0.731 or higher, there was no problem with reliability.

Table 1. Factor analysis.

Construct	Indicators	Factor Loadings			
		1	2	3	4
Psychological Ownership	PO1	0.951	0.069	−0.128	−0.056
	PO2	0.920	0.119	−0.131	−0.104
	PO3	0.902	0.103	−0.148	−0.106
Attitude toward Content Information	CI1	−0.007	0.931	−0.113	−0.088
	CI2	0.160	0.923	−0.063	−0.089
	CI3	0.146	0.913	0.010	−0.199
Psychological Distance	PD1	−0.213	0.028	0.913	0.049
	PD2	−0.127	−0.172	0.887	0.207
Recommendation Message	RM1	−0.120	−0.050	0.075	0.898
	RM2	−0.084	−0.275	0.173	0.815
Eigenvalue		3.981	2.182	1.448	1.098
% of variance		26.940	26.901	17.285	15.960
Cumulative %		26.940	53.842	71.126	87.086
Cronbach’s Alpha		0.938	0.932	0.840	0.731

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.

4.2. Manipulation Check

For the manipulation check, we performed an ANOVA test to confirm the mean difference between each group corresponding to the independent variable. First, in the experimental condition of psychological ownership, participants exposed to the conditions of high psychological ownership perceived that they felt higher ownership of the target online service (Mean = 4.37) than those exposed to the condition of low psychological ownership (Mean = 3.29; $F(1, 106) = 31.40, p < 0.01$). Second, to manipulation check for method of recommendation message, the results revealed that the mean of the group with abstract recommendation message was found to be 4.40 points, which was a statistically significant difference from the mean of 2.98 points found in the group with concrete recommendation message ($F(1, 106) = 31.13, p < 0.001$). Therefore, the experimental conditions of the two independent variables were found to be manipulated as intended by the researcher.

4.3. Hypotheses Tests

To test Hypothesis 1, it was confirmed whether there was a difference in psychological distance between users with high psychological ownership of the online service and users with low psychological ownership of the online service. As a result of ANOVA, users with high psychological ownership of online services had a psychological distance average score of 4.36, while users with low psychological ownership of online services had psychological distance average score of 3.16 ($F(1, 106) = 18.69, p < 0.001$). Consequently, hypothesis 1 was supported.

We conducted a two-way ANOVA on attitude toward content information that was measured using three items. The values were averaged and used in the analysis. Table 2 shows the descriptive statistics of attitude toward content information, and Table 3 shows the results of the ANOVA test.

Table 2. Descriptive statics.

	Method of Recommendation Message		
	Concrete	Abstract	Total
High psychological ownership	4.96 (1.60) <i>n</i> = 31	3.74 (1.18) <i>n</i> = 26	4.40 (1.54) <i>n</i> = 57
Low psychological ownership	3.24 (1.44) <i>n</i> = 26	4.88 (1.42) <i>n</i> = 25	4.05 (1.64) <i>n</i> = 51
Total	4.18 (1.74) <i>n</i> = 57	4.30 (1.41) <i>n</i> = 51	4.23 (1.59) <i>n</i> = 108

Table 3. Result of ANOVA test.

	Sum of Squares	Degree of Freedom	Mean Square	F-Value	<i>p</i> -Value
Psychological ownership (A)	2.23	1	2.23	1.10	0.30
Method of recommendation message (B)	1.20	1	1.20	0.59	0.44
A × B	54.44	1	54.44	26.78	0.00
Error	211.45	104	2.03		
Total	2206.44	108			

The main effects of both psychological ownership and recommendation message were not statistically significant ($F(1, 104) = 1.10, ns$; $F(1, 104) = 0.59, ns$). On the other hand, psychological ownership and recommendation message revealed an interaction relationship ($F(1, 104) = 26.78, p < 0.001$). Specifically, the results of confirming the interaction effects are as follows (see Figure 3). Under the condition of high psychological ownership, participants exposed to concrete recommendation message had a more positive attitude toward content information compared with participants exposed to abstract message, and the difference was significant ($M_{concrete} = 4.96$ vs. $M_{abstract} = 3.74$ $F(1, 55) = 10.31, p < 0.01$). On the contrary, under the condition of low psychological ownership, participants exposed to abstract recommendation message had a more positive attitude toward content information compared with participants exposed to concrete message, and the difference was significant ($M_{concrete} = 3.24$ vs. $M_{abstract} = 4.88$ $F(1, 49) = 16.67, p < 0.01$). Thus, Hypothesis 2 and 3 were supported.

The results of ANOVA analysis were statistically significant, but additionally, a multiple comparison test was performed to confirm specific differences among groups (see Table 4). First, the groups were classified according to the level of psychological ownership and the types of recommendation message (Group 1: high psychological ownership, abstract message, Group 2: high psychological ownership, concrete message, Group 3: low psychological ownership, abstract message, Group 4: low psychological ownership, concrete message). As a result of Tukey HSD post hoc test, it was revealed that there were

significant differences in attitudes toward content information between group 1 and 2, group 1 and 3, group 2 and 4, and group 3 and 4.

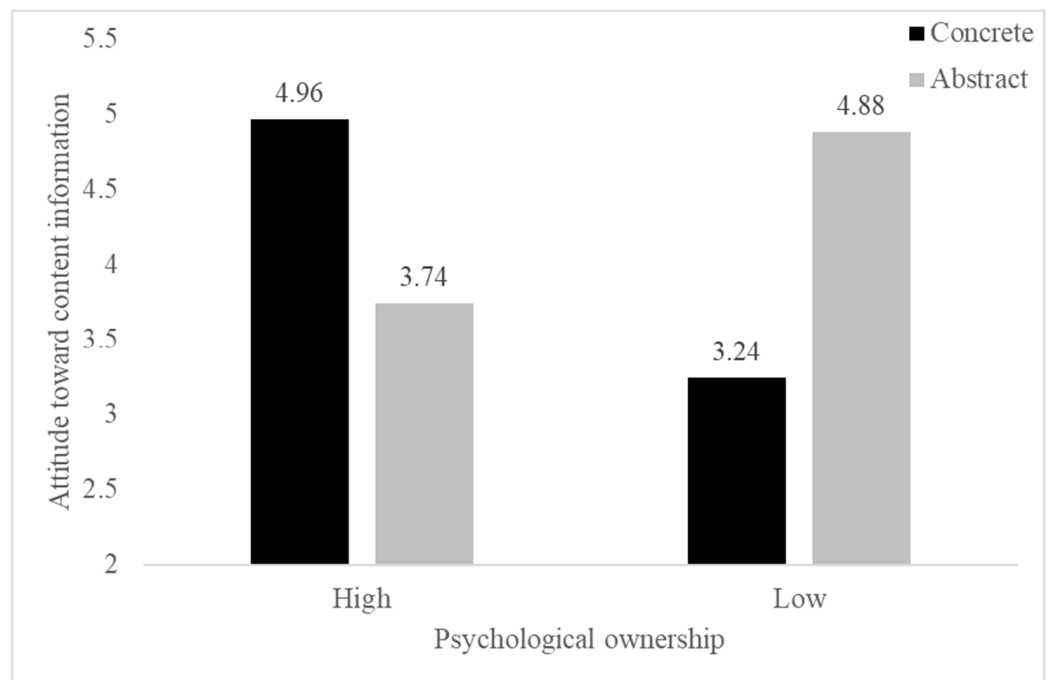


Figure 3. Interaction effect of psychological ownership and recommendation message on attitude toward content information.

Table 4. Multiple comparison test to attitude toward content information.

(I) Group	(J) Group	Mean Difference (I,J)	Std. Error	Sig.
Group 1	2	-1.2135 *	0.3792	0.0097
	3	-1.1364 *	0.3994	0.0270
	4	0.5000	0.3955	0.5876
Group 2	1	1.2135 *	0.3792	0.0097
	3	0.0771	0.3833	0.9971
	4	1.7135 *	0.3792	0.0001
Group 3	1	1.1364 *	0.3994	0.0270
	2	-0.0771	0.3833	0.9971
	4	1.6364 *	0.3994	0.0005
Group 4	1	-0.5000	0.3955	0.5876
	2	-1.7135 *	0.3792	0.0001
	3	-1.6364 *	0.3994	0.0005

Note: * The mean difference is significant at the 0.05 level. Group 1: high psychological ownership, abstract message, Group 2: high psychological ownership, concrete message, Group 3: low psychological ownership, abstract message, Group 4: low psychological ownership, concrete message.

To investigate the moderated mediation effect, we conducted a bootstrapping method using Model 14 in the PROCESS macro [49]. PROCESS macro model 14 is being utilized in various social science fields to confirm the moderated mediation effect [50–53]. Specifically, we estimated the conditional indirect effect of psychological ownership on attitude toward content information through psychological distance depending on method of recommendation message using unstandardized coefficients and bootstrapping with 5000 samples to place 95% confidence intervals around estimates of the indirect effects (see Figure 4). As a result, the indirect effect of psychological ownership on attitude toward content information through psychological distance was significant for more concrete (coded as 0;

$b = 0.53, SE = 0.26, 95\% CI = 0.13 \text{ to } 1.12$) and more abstract method of recommendation message (coded as 1; $b = -0.36, SE = 0.20, 95\% CI = -0.80 \text{ to } -0.03$).

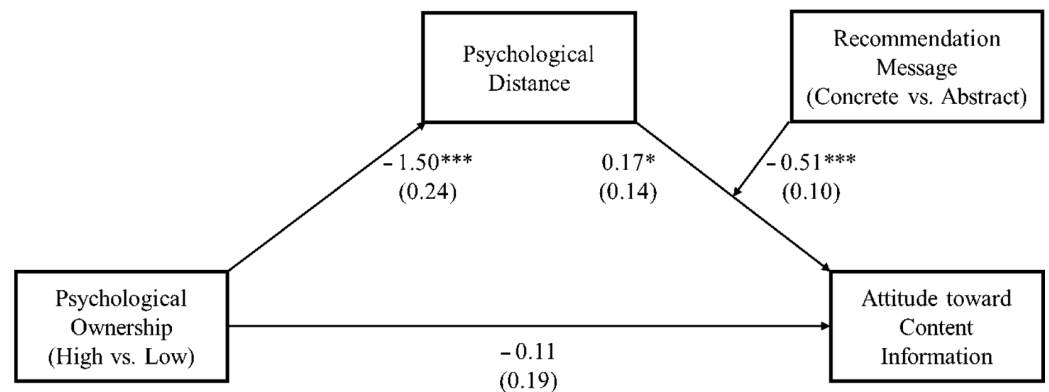


Figure 4. Results of the mediation model of psychological ownership for attitude toward content information through psychological distance. Note. The indirect effect is contingent upon recommendation message. Path entries are unstandardized coefficients. Psychological ownership (coded as 0: low, 1: high). Recommendation message (coded as 0: concrete, 1: abstract). * $p < 0.05$. *** $p < 0.001$.

As shown in Table 5, in both the concrete and abstract groups of the recommendation message, the indirect effect of psychological distance is significant because ‘0’ between LLCI and ULCI is not included within the 95% confidence interval. In other words, as expected, the finding could explain the indirect effect of psychological ownership or attitude toward content information through psychological distance moderated by recommendation message.

Table 5. Conditional indirect effect of psychological ownership for attitude toward content information through psychological distance moderated by recommendation message.

Mediator	Recommendation Message	b	SE	Boot LL 95% CI	Boot UL 95% CI
Psychological distance	Concrete	0.53	0.26	0.13	1.12
	Abstract	-0.36	0.20	-0.80	-0.03

Note. SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit. Unstandardized regression coefficients are reported. Bootstrap sample size 5000.

Table 6 summarizes the results of hypotheses with main statistical parameters. Consequently, all the proposed hypotheses were statistically significant.

Table 6. Results of hypotheses.

Hypotheses	Results
Hypothesis 1: Users with high psychological ownership of an online service will feel that the psychological distance to the online service is closer than users with low psychological ownership ($M_{\text{high_PO}} = 4.36$ vs. $M_{\text{low_PO}} = 3.16, F(1, 106) = 18.68, p < 0.001$).	Supported
Hypothesis 2: When presenting content recommendations to users with high psychological ownership of online services, concrete messages will be more effective than abstract messages ($M_{\text{concrete}} = 4.96$ vs. $M_{\text{abstract}} = 3.74, F(1, 55) = 10.31, p < 0.01$).	Supported
Hypothesis 3: When presenting content recommendations to users with low psychological ownership of online services, abstract messages will be more effective than concrete messages ($M_{\text{concrete}} = 3.24$ vs. $M_{\text{abstract}} = 4.88, F(1, 49) = 16.67, p < 0.01$).	Supported

4.4. Discussion

This study confirmed the interaction effect of psychological ownership and the recommendation method for content information. Our findings demonstrated that when users have a strong psychological ownership of online services, a content recommendation method composed of more concrete messages is effective. On the contrary, when users have a weak psychological ownership of an online service, a content recommendation method composed of more abstract messages is effective. In this study, we predicted that the psychological distance, which refers to how close or distant one feels in relation to a particular target, would be the underlying mechanism. Therefore, in our last analysis, we specifically verified this through a mediation analysis and the results confirmed that psychological distance mediated the effects described above. This study is consistent with a research stream focusing on intangible objects rather than tangible objects of psychological ownership. In particular, due to the development of information technology, the behavioral patterns of users in the digital world are drawing attention, and this study also examines the behavior of individuals based on the concept of psychological ownership in an online context. The psychological ownership in an online context has been studied for various targets: online music streaming service [11,16], crowdfunding [20], online community [19,24], sharing service [26,27], and social network service [21]. However, this study has originality from previous studies, in the aspect that studies examining the relationship between psychological ownership and Over-the-Top service have not been conducted. Furthermore, reflecting the study of Claus et al. [54], which provided a clue about the relationship between the construal level theory and ownership, we proposed a psychological ownership as a psychological distance. This study has a distinction in that it is confirmed that psychological distance plays a mediating role of psychological ownership even in online services by expanding the object of ownership.

5. Conclusions

The theoretical contributions of this study are as follows. The results of this study once again corroborated the broad findings of preceding research, namely that psychological ownership can develop even for online services, which are intangible targets [16,21,22]. As digitization progresses, the targets individuals own are becoming more and more intangible. For example, materials that were recorded on paper in the past are being stored as files on cloud services such as Google Drive and Evernote, and we have a sense of ownership of such digitized content as our "own". In addition, we develop psychological ownership of our online game characters and our social media feeds and accounts. In this regard, it has been argued that psychological ownership can have a major impact on consumers even in a digital environment, but this argument needs to be verified in various contexts. This study re-verified that the method of recommending information (concrete vs. abstract) performs the same role. In addition, this study confirmed the role of psychological distance, by verifying the interaction between psychological ownership and the type of recommendation for content information. Finally, this study supports the study of Claus and Warlop [40], which points us toward the relationship between psychological ownership and construal level theory, by arguing that psychological ownership can play a role in terms of psychological distance even in an online environment. To support this argument, this study verified the moderated mediation effect of psychological distance using process model 14 developed by Hayes [49]. This demonstrated that psychological ownership affects the efficacy of different types of recommendation information through psychological distance.

The insights gained from this study can have the following practical applications. This study indicates that one can use the degree of psychological ownership of users to develop stronger online business strategies. The results of this study showed that psychological ownership influences the decision-making of users. For example, users who have invested a lot of money, time, and effort in online content services can be expected to have greater psychological ownership than those who do not [10]. Therefore, service providers can use

these user data to classify a group that has strong psychological ownership and a group that does not, and when presenting content recommendation information to users, the provider can then plan a differentiated promotion strategy for each group thus classified. Furthermore, the findings of this research contribute to establishing specific guidelines for content curators providing valuable information to users. Recently, users face a difficulty in not being able to choose due to overload of information. Continuously recommending unwanted information by users in online services can be a factor that lowers the reputation of the service and increases dissatisfaction. In order to solve these users' difficulties, content curators have been contemplating ways to effectively present information to users. In other words, content curators should make it easier for users to accept the information provided by the service. At this time, if users' personal preferences and psychological factors are identified and recommendation information is provided, users' satisfaction can be further increased. According to the results of this study, for example, when presenting recommended content, it is expected that it will be more effective if a message tailored to individual characteristics is provided rather than showing the same message to all users.

This study has the following research limitations. First, when analyzing the method of presenting recommendation information, we only considered the contrast of specific and abstract messages. There are many other aspects of how messages are composed, and further research will be needed to conduct tests that incorporate more variables. In addition, although the test target of this study was limited to OTT services, it is necessary to expand the research to cover a more diverse range of online services (e.g., social media, online communities) to strengthen the validity of our findings. Second, in this study, the experimental subjects were limited to the video streaming service. It can be applied to various types of online services such as games, cloud services, and social media, and is expected to show various results depending on the properties of the online service. Finally, this study used a scenario method by adopting the experimental techniques of previous studies to treat level of psychological ownership. However, when individuals actually use and experience certain objects, differences in the degree of psychological ownership may appear (stronger or vice versa). Therefore, in future research, having experiment participants experience an online service for a certain period of time and then presenting various variables or measurements will be a good way to improve the validity of the experiment. In addition, it will be interesting to apply techniques such as eye-tracking and implicit behavior tracking [7,8] to the concept of psychological ownership. For instance, "How would the layout of a website be attractive to users with a high sense of psychological possession?" The answer to these questions could be attempted through eye-tracking. Conversely, groups of psychological ownership could be classified according to what part of the website or how long the user's gazes stay. In summary, it is expected that future research will be able to derive more interesting findings using the latest technologies in the psychological aspect of individuals.

Author Contributions: B.-G. Seo designed the model and built the logic for the hypotheses. D.-H. Park analyzed the data and carried out the insights and implementation. Both authors shaped the research and provided essential feedback and discussion. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

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Appendix A

Instruction: Suppose you have free time, and you want to watch a movie through an online movie streaming platform. You plan to use Watcha* online service, a video streaming platform to watch movies. The following is the main page of Watcha service.

*Watcha: Online platform that provides video content that can be enjoyed on PCs and smartphones.

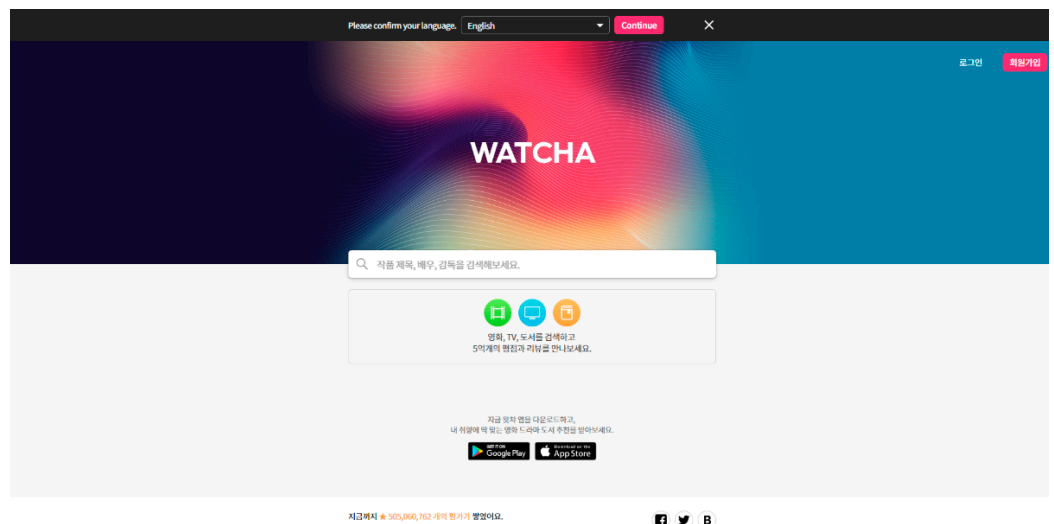


Figure A1. Watcha online movie streaming platform.

Instruction: You need to log in to this online service to search and watch movies. The following image shows the login page. You can log in and use the service in two ways: there are “Premium” users who pay a certain fee and can use the service for an unlimited number of times, and “Guest” users who can try the service for two weeks free of charge.

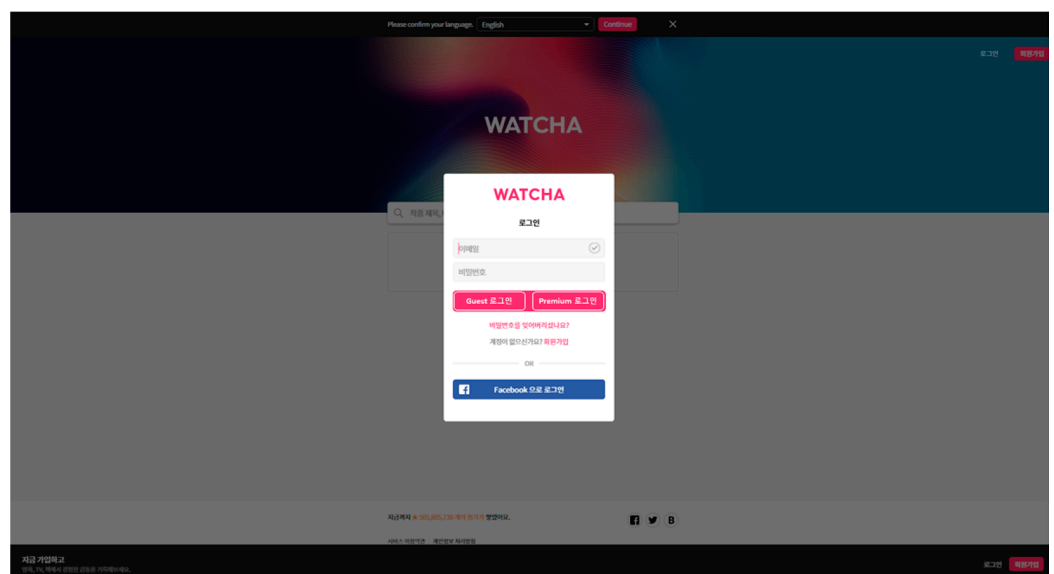


Figure A2. Watcha login page.

Appendix B

<Concrete Condition>

Instruction: Watcha service not only allows you to watch movies, but also offers the service of recommending movies to you. While you were using Watcha service, the following upcoming releases were recommended. Please check the recommendation information presented.

What is the key point of watching this movie?

State-of-the art videography equipment and the latest visual special effects (VFX)

With one million dollars in production cost this movie was filmed on a site spanning over 800 acres, with the hottest Hollywood cast and crew

Title: AD ASTRA
Directed by James Gray
Written by Ethan Gross
Produced by Brad Pitt, Dede Gardner, p.g.a., Jeremy Kleiner, p.g.a., James Gray, p.g.a.
CAST Brad Pitt, Tommy Lee Jones, Ruth Negga, Liv Tyler, and Donald Sutherland

미 육군 소령 '로이 맥브라이드'(브래드 피트)는 우주의 지적생명체를 찾기 위한 '리마' 프로젝트를 수행하다 실종된 아버지를 영웅이라 믿으며 우주 비행사의 꿈을 키웠다. 어느 날, '로이'는 이상 현상으로 우주 안테나에서 지구로 추적하는 사고를 당하고 인류를 위협할 건류 급중 현상인 이 '배지' 사태가 자신의 아버지가 맡은 위험한 상황에서 시작되었다는 이야기를 듣게 된다. 아버지가 살아 있다는 충격적인 사실과 함께 그를 죽여야 한다는 임무를 맡게 된 '로이'는 우주로 향하게 되는데...




Figure A3. Upcoming releases recommended by watcha (concrete condition).

<Abstract Condition>

Why should you watch this movie?

Dramatic scenes that overpower the screen with visual pleasure

A highly anticipated movie with unprecedented production cost and immense, blockbuster scale

Title: AD ASTRA
Directed by James Gray
Written by Ethan Gross
Produced by Brad Pitt, Dede Gardner, p.g.a., Jeremy Kleiner, p.g.a., James Gray, p.g.a.
CAST Brad Pitt, Tommy Lee Jones, Ruth Negga, Liv Tyler, and Donald Sutherland

미 육군 소령 '로이 맥브라이드'(브래드 피트)는 우주의 지적생명체를 찾기 위한 '리마' 프로젝트를 수행하다 실종된 아버지를 영웅이라 믿으며 우주 비행사의 꿈을 키웠다. 어느 날, '로이'는 이상 현상으로 우주 안테나에서 지구로 추적하는 사고를 당하고 인류를 위협할 건류 급중 현상인 이 '배지' 사태가 자신의 아버지가 맡은 위험한 상황에서 시작되었다는 이야기를 듣게 된다. 아버지가 살아 있다는 충격적인 사실과 함께 그를 죽여야 한다는 임무를 맡게 된 '로이'는 우주로 향하게 되는데...




Figure A4. Upcoming releases recommended by watcha (abstract condition).

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