Interdisciplinary Practice in Industrial Design, Vol. 144, 2024, 179–187
https://doi.org/10.54941/ahfe1005130

Effect of Freedom of Customization on Psychological Ownership

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ABSTRACT

The digitization of tangible objects associated with ICT development is significantly changing consumer behavior from possession-based to access-based consumption. Access-based content consumption, especially in streaming services such as Spotify, YouTube, and Apple Music, leads to a potential decrease in *Psychological Ownership* of the service. Since *Psychological Ownership* has been suggested to increase user loyalty and willingness to pay (WTP) for a service, the decrease in *Psychological Ownership* is an important issue to avoid in subscription-based streaming services, where persistence rates are directly related to profits. In this study, we conducted a survey and experiments to clarify the relationship between the degree of freedom to customize playlists and *Psychological Ownership* in streaming services. The survey revealed that sharing and editing functions are the most important functions that lead to the occurrence of *Psychological Ownership* in streaming services. Subsequent experiments showed that increasing the degree of freedom to customize playlists leads to increases in "sense of control," "*Psychological Ownership*," and "workload." It was also found that the amount of increase in each item's value varied depending on whether the desire to share the playlist was present or not.

Keywords: Psychological ownership, Freedom of customizable, Online services design

INTRODUCTION

The digitization of tangible objects associated with ICT development creates new products, services, and markets, while at the same time significantly changing consumer behavior from possession-based to access-based (Iseki, 2023). This change in behavior can threaten consumers' sense of *Psychological Ownership*, relocate them to collective objects, and create new opportunities for retention (Morewedge et al., 2021). Access-based content consumption, especially in streaming services for online music, such as Spotify, YouTube, and Apple Music, can lead to a potential decline in the sense of *Psychological Ownership* of the service (Sinclair and Tinson, 2017). *Psychological Ownership* refers to the formation of a self-concept of an external object (Frinze et al., 2020), resulting in a psychological state in which consumers have a sense of ownership of the object as an alternative to Physical Ownership (Pierce et al., 2002). Since these perceptual characteristics have been suggested to increase reuse intentions, loyalty, and willingness to pay (WTP) for a service, users would benefit greatly from a sense of *Psychological Ownership* (Kwon, Kawamata and Suda 2023), (Atasoy and Morewedge,

2017) in subscription-based streaming services (Nakagawa, 2021), where persistence rates are directly related to profits.

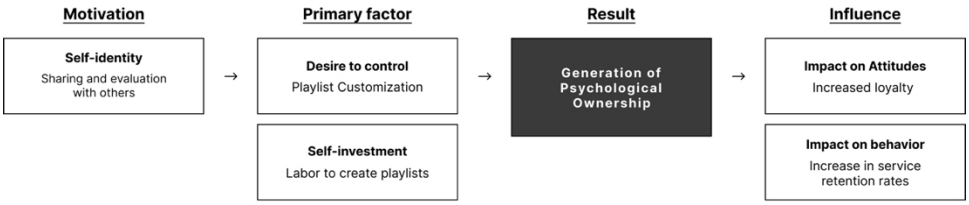

Figure 1: Adapted in part from *psychological ownership* theory (Jussila et al., 2015).

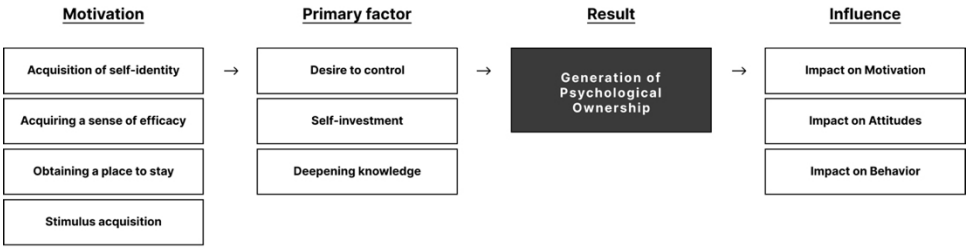

Figure 2: Generation process of *psychological ownership* during playlist creation in streaming services.

Sinclair and Tinson (2017) suggests that to increase users' sense of *Psychological Ownership* of music streaming services, it is important to increase their sense of control over the content they create in their streaming profiles, which can be shared among others. In his research on Music-Streaming Services, Iseki (2023) found that increasing the customizability of an application is important for increasing the desire for control, which is a factor in generating a sense of *Psychological Ownership*. Existing streaming services share User-Generated Playlists (UGP) (Li et al., 2022). UGPs which are generated within a normative framework shared among users, are highly relevant for the recognition and expansion of C-to-C services (González-Rodríguez et al., 2021) and should be further promoted.

However, research on the relationship between the degree of freedom of UI customization and *Psychological Ownership* when using services remains insufficient. Based on the above, this study examines how the degree of freedom to customize playlists in streaming services affects users' sense of *Psychological Ownership*.

Psychological Ownership Theory and Conceptual Models

Psychological Ownership (Jussila et al., 2015) theory presents a conceptual model that integrates the motivations and factors that cause *Psychological Ownership*, target attributes, moderating influences, and consequences of this psychological state (see Figure 1).

Motives that cause *Psychological Ownership* are divided into four main categories: "Acquiring a sense of efficacy," "Acquisition of self-identity," "Acquiring a place to stay," and "Acquisition of stimuli," while factors are divided into three categories: "Desire to control," "Self-investment," and "Deepening knowledge." Generating normative frameworks such as playlists is important for acquiring self-identity (Lüders, Dinkelberg and Quayle 2022). In addition, users must invest in UI control and effort when creating playlists. Based on the above, this study focused on "Acquisition of self-identity" as the motivation for *Psychological Ownership*, and "Desire to control" and "Self-investment" as the factors. Based on the conceptual model of *Psychological Ownership*, the process of generating a sense of *Psychological Ownership* during playlist creation in streaming services is illustrated in Figure 2.

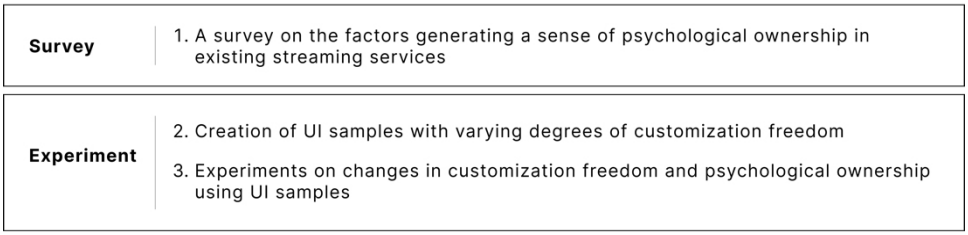

Figure 3: Research method.

Table 1. List of extracted functions.

List of Functions		
My Lists: Sort by	My Lists: Change Thumbnail	My Listings: Rename
My Lists: Description	My Lists: Share	My Lists: Followers/Followers
My Lists: Like Function	My List: Co-Edit	Content: Ranking
Content: Recently Accessed	Content: Highlight Access	Content: Recommendations
Content: Exclusives	Content: Share Function	Content: Like Function
Profile: Icon Settings	Profile: Description	Profile: Name Function
Profile: Viewing Time Record	Profile: Notifications & Privacy	Profile: Multiple Accounts
Profile: Followers and Followers	Profile: Access History	Profile: Download Function

RESEARCH METHOD

First, a survey was conducted on the factors that generate a sense of *Psychological Ownership* in existing streaming services, followed by an experiment focusing on the relationship between the degree of freedom to customize playlists and the sense of *Psychological Ownership*. The main flow of the study is as follows (see Figure 3).

A Study on the Causes of Psychological Ownership in Streaming Services

A survey of 33 people was conducted to identify the factors that cause users a sense of *Psychological Ownership* in the use of streaming services. The survey

identified 24 functions from five streaming services that use a subscription system (Amazon Music, Apple Music, Netflix, YouTube, and Spotify) and asked whether these functions were linked to the generation of a sense of *Psychological Ownership* (see Table 1).

Figure 4: Three playlist creation UI samples with varying degrees of customization freedom.

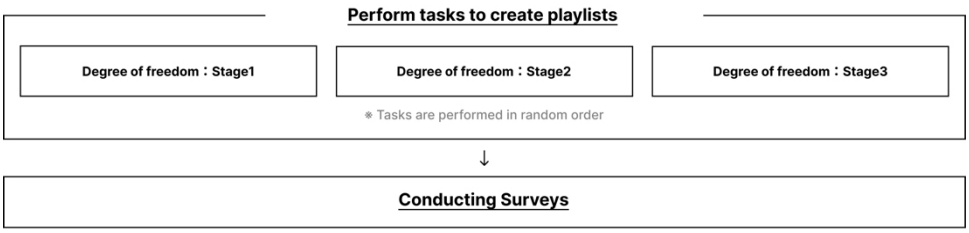

Figure 5: Detailed experimental procedures.

An Experiment on the Degree of Freedom of Customization and Psychological Ownership

This experiment aimed to determine how the degree of freedom to customize playlists in streaming services affects users' sense of *Psychological Ownership*. Using the seven features that affect *Psychological Ownership* obtained in the survey, we created three playlist creation UI samples (see Figure 4) with increasing and decreasing degrees of freedom of customization; the UI samples were divided into three levels of freedom, with the first level consisting of two features, "song selection" and "title editing," and the second level consisting of two features, "playlist sharing" and " Edit Thumbnail" were added for four functions, and the third level consisted of seven functions, including

"Like," "Follow/Follow", and "Edit Description." In addition, the sample was created using Xcode with a UI similar to that of Apple Music.Using these three UI samples, 20 subjects were given the task of creating a playlist, and questionnaires were administered to measure "sense of control," "*Psychological Ownership*," and "workload" after each task was completed (see Figure 5).

Table 2. Factor analysis results.

Factor 1: Shared Functions	Loadings	Factor 2: Shared Functions	Loadings
My List : Like Function	0.849	My List : Thumbnail Editing	0.895
My List : Followers/followers	0.837	Profile : Icon Editing	0.678
Profile : Followers/followers	0.737	Profile : Name functions	0.585
Profile : Description	0.566	Content : Like Function	0.576
Content : Share function	0.475	My List : Name Editing	0.576
Profile : Name functions	0.422	Content : Evaluation Function	0.377
My List : Share function	0.355	My List : Share function	0.321
		Profile : Description	0.318

The sense of control was measured by four items (Reinterpreted from Kwon, Kawamata and Suda, 2023 and Bagga, Bendle and Cotte, 2019) : "I was able to customize it as I wanted", "I can customize it to my liking," "I felt like I could customize it anytime I wanted," and "I can customize it freely."

Psychological Ownership was measured by four items (Reinterpreted from Shu and Peak, 2010) : "I feel like the playlist I created is truly mine," "I feel like I own the playlist I created," "I get a sense of making the playlist my own," and "I feel like I am the personal owner of the playlist I created."

Workload was measured from the NASA-TLX (Excerpted from Miyake, 1993) with four items : "How much psychological desire did it take to create the playlist?," "How much time desire did it take to create the playlist?," "How much stress did the creation cause?," and "How would you rate the playlist you created?."

Each measurement scale was answered using the 7-point Likert scale method. Finally, the subjects' attributes and thoughts were investigated in an interview.

RESULTS AND DISCUSSION

Results of a Survey on the Generation of Psychological Ownership in Streaming Services

A factor analysis was conducted on the survey results to clarify the patterns and interrelationships of the functions that affect the sense of *Psychological Ownership*. In the factor analysis, eight factors had eigenvalues exceeding 1.0. However, too many factors would make interpretation difficult and create the possibility of overfitting, so the number of factors with a minimum information criterion of three was adopted this time, referring to the value

of Akaike's Information Criterion (AIC). In addition, because *Psychological Ownership* has psychological characteristics, and the factors are likely to interact with each other, an oblique rotation (Quartimin) was employed. Although the cumulative contribution rate of Factor 3 was low at 44%, we believe that this cumulative contribution rate is appropriate, considering that there are various factors that affect the sense of *Psychological Ownership* and that the streaming service itself, which was the subject of this study, may not evoke a sense of *Psychological Ownership*.

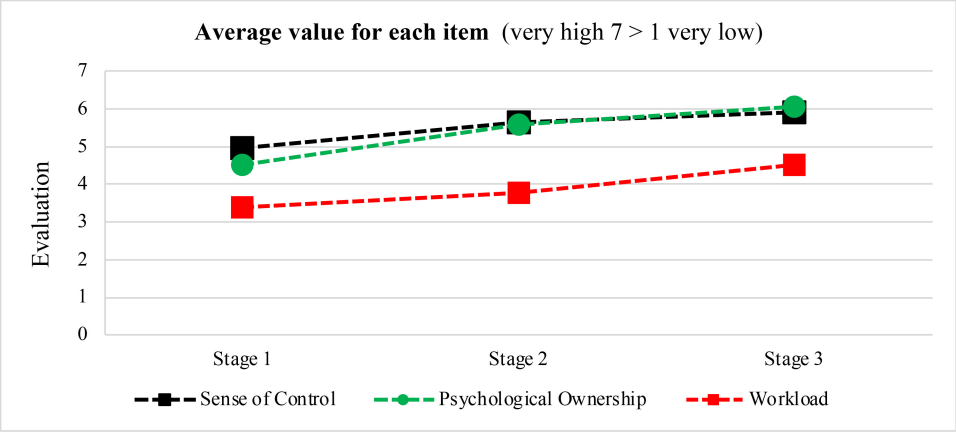

Figure 6: Average value of each item according to the level of customization freedom

Table 3. Total contribution to function.

Function	Value	Function	Value
Like Function	0.849	Share function	0.475
Description	0.837	Thumbnail Editing	0.422
followers/followers	0.737	Song Selection	0.355
Name functions	0.566		

Factor 1 was mostly related to how others evaluated and viewed one's account and MyList, while Factor 2 was mostly related to the customization and editing of MyList and the profile (see Table 2). Factor 3 did not show any trend in the functions listed. These results suggest that the sharing and editing functions may generate a sense of *Psychological Ownership* of streaming services.

Next, we summarized similar functions among those listed in the survey and applied the formula (factor 1 loadings × factor 1 contribution ratio) + (factor 2 loadings × factor 2 contribution ratio) + (factor 3 loadings × factor 3 contribution ratio) to the summarized factors to calculate the values indicating their contribution to the overall variation. We identified seven specific functions that could lead to the generation of a sense of *Psychological Ownership* (see Table 3).

Results and Discussion on Freedom of Customization and Psychological Ownership

We found that sense of control, *Psychological Ownership*, and workload increased with increasing degrees of customization freedom, indicating that increasing the degree of customization freedom in My List causes a sense of *Psychological Ownership* over the targeted service (see Figure 6). The results of the repeated two-way ANOVAs also showed significant differences between experiments. This indicates that there was a statistically significant change in the results from experiment to experiment. However, we found that user workload also increased when the degree of customization freedom increased. In particular, when customizing functions related to sharing with others, such as "Like" and "Follow/Follow," the interview results revealed that the workload increases as users become aware of how they are viewed and considered by others.

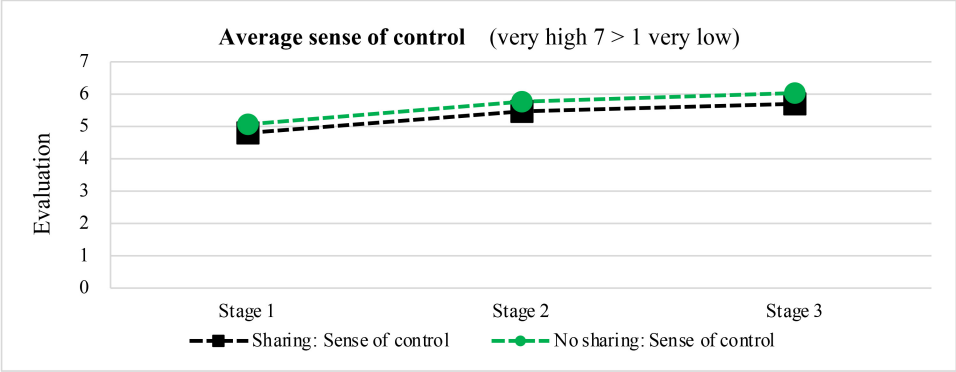

Figure 7: Differences in sense of control based on presence or absence of shared desires.

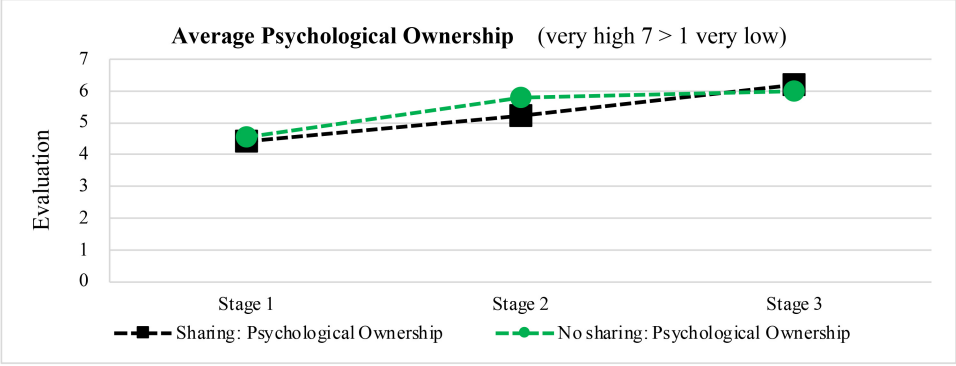

Figure 8: Differences in *psychological ownership* based on the presence or absence of a desire to share.

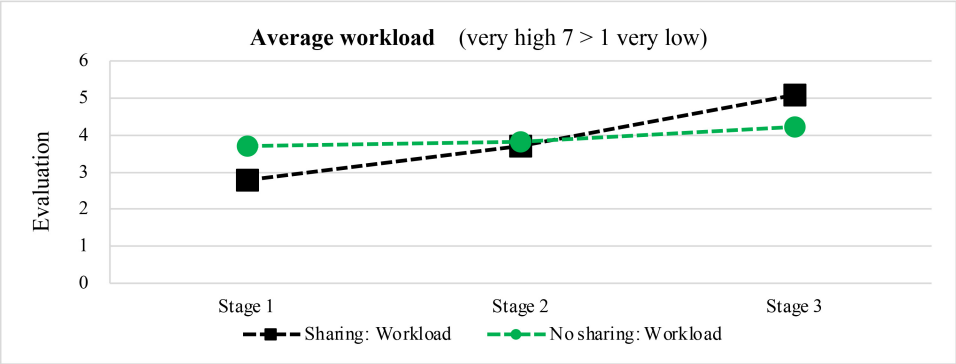

Figure 9: Difference in workload based on shared desires.

The respondents were divided into seven who desired to share playlists and 13 who did not. Figures 7–9 show the results for those who did and did not desire to share. The sense of control exhibited a similar increasing trend as the degree of freedom stage increased, regardless of whether the desire to share was present.

For *Psychological Ownership* and workload, the values were higher when there was no desire to share up to the second level of customization freedom; however, from the third level, the values were higher when there was a desire to share.

In the UI sample for the third level, sharing functions such as "Like" and "Follow/Follow" were added. These results suggest that people who desire to share are more likely to feel a sense of *Psychological Ownership* when they customize functions related to sharing. However, they are also more likely to increase their workload when they are aware of others. The results suggest that people without a desire to share do not customize sharing functions; therefore, the workload does not change much and sense of *Psychological Ownership* does not change much from the second to the third level of freedom to customize.

CONCLUSION

Through research and experimentation, it was found that increasing the degree of freedom to customize sharing and editing functions when designing UGPs, such as playlists and "My Lists" for streaming services, can increase users' sense of control and *Psychological Ownership*. Based on the *Psychological Ownership* theory, users can reflect on their playlists and gain a sense of identity through customization. This series of processes influences the generation of a sense of *Psychological Ownership* and motivation to create playlists. Because self-identity, which is a motivator, can also be acquired by sharing a normative framework such as a playlist with others, we believe that by distinguishing whether individuals have a desire to share and design the content of customization accordingly, we can expect more efficient motivation for a sense of *Psychological Ownership*. On the other hand, an increase

in the degree of freedom of customization also leads to an increase in workload, which may not lead to the creation of a My List itself and may not generate a sense of *Psychological Ownership* itself; therefore, careful design is necessary.

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