



# Music Roles Affect the Selection of Consumption Means: A Questionnaire Survey of People's Expectations for Music and Exploratory Factor Analysis

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## Abstract

People listen to music for various purposes, and the roles that listeners expect from music can vary from person to person. In recent years, “subscription-based streaming services” (hereinafter referred to as “subscription”) have increased their share in the music market, thereby changing the way people listen to music. Though, the impact of this change on the role of music, is yet to be explored. This study analyzed survey data to reveal the relationship between the expected roles of music and the choice of music consumption means, including subscription. In particular, we obtained that a factor in the use of subscription is the expectation of constructing a personal identity. We also found that both purchase and live usage are affected by two factors: *the expectation of fan identity construction* and *the expectation of artist contribution*. This indicates that subscription is not an alternative to the existing means, but a new kind of consumption means in the music market. It was also found that subscription facilitates the construction of personal identity through music.

**Keywords** Music · Subscription service · Exploratory factor analysis · Logistic regression analysis · Consumer behavior

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## 1 Introduction

In both music psychology and consumer behavior theory, the relationship between songs/genres and personality traits has been studied [1, 7]. With regard to music consumption means, one of the main research topics has been the monetary cost and information search costs related to pre-purchase listening behavior, before the advent of “subscription-based streaming services” (hereinafter referred to as “subscription”) [2, 5]. However, the advent of subscription has facilitated the exploration of songs and changed consumer behavior in overall music markets. Accordingly, multiple studies are increasingly focusing on the impact of using subscription [4, 11, 13].

Datta et al. [4] studied the effects of music streaming service use, including both paid and free services, on subsequent music listening trends. They reported that the use of music streaming services significantly increased music consumption and diversity, with some individual differences. This can be interpreted as some consumers who were limited by cost constraints were able to meet their music consumption demands through the use of music streaming services. Other studies have shown that music streaming services cannibalize existing music purchases but also contribute to overall music market revenue, except in a few cases [11, 13].

However, the relationship between the cultural aspects of music, that is, the multiple roles it plays [6, 8, 9] and the choice of music consumption means, including subscription, remains unknown. There is no guarantee that the means of listening to music, which have been transformed by recording and distribution technologies, are capable of fulfilling the various roles that music originally possessed. Thus, it is important to confirm this relationship, both from a business perspective of identifying unsatisfied needs and from a social perspective of developing music culture. It is also useful to discuss whether subscription will completely replace or coexist with other existing means in the future.

Therefore, in this study, we investigated whether the role that individuals expect from music, as explanatory variables that can explain their choice of music consumption means. The results showed that the factor of personal identity construction expectations from music affected only subscription use. This suggests that subscription provides the market with a new kind of means that is not an alternative to the existing means and facilitates the construction of individual identity through music. In addition, the factor of interpersonal expectations from music was not found to have a statistically significant effect on any of the means examined in this study. This suggests that all these means in the current music market are unattractive to music listeners who expect interpersonal relationships to develop through music, indicating the need for other means of listening to music to satisfy their demand.

## 2 Methods

### 2.1 Roles of Music

Several studies have classified the purposes of using music into various categories [6, 8, 9]. However, in the present study, “using music” does not only refer to listening to music, but also to various human activities such as portraying a particular image to others by making them listen to music. We interpret the purposes of using music, exactly as the roles of music for society, and we focus on the classification of these purposes.

Although the classification pattern partially differs among these studies [6, 8, 9], Lonsdale and North [8] indicate that purposes of using music can be classified into six categories (*positive mood management*, *negative mood management*, *diversion*, *interpersonal relationships*, *personal identity*, and *surveillance*). We adopted this classification partially in our study, because it is popular and often used for reference. Specifically, among the six purposes (i.e., six roles), we selected as constructs the expectations for two roles, *interpersonal relationships* and *personal identity*, as constructs as they are assumed to affect the choice of music consumption means in particular. The other four reasons for music use were not considered, because they are assumed to affect the preference of the music (e.g., songs or genres) listened to rather than the choice of music consumption means. Furthermore, as for the situation in Japan, where the survey of this study was conducted, specificity regarding fandom has been reported in pop music and other fields [10, 12]. Since music consumption by artist fans cannot be ignored in the Japanese music market, we also considered constructs as the role that fans expect from music.

### 2.2 Questionnaire

In this study, we administered an online survey. This survey was conducted in June 2020 in two parts—a screening survey and a main survey—among monitors residing in Japan who were contracted by an Internet research company. The screening survey was conducted on 10,552 respondents, and the main survey was conducted on 453 respondents who satisfied the following three conditions.

The first condition was that they usually listened to music. The second condition was to ensure a sufficient sample size of those who had experience using subscription services. Since the percentage of respondents with subscription service use experience was 24.3% in the screening survey, the subjects in the main survey were sampled at an approximate 1:1 ratio, for those with and without subscription service use experience, respectively. The third condition was that the respondents consented that they had understood the overview explanation of the subscription service, which was presented during the screening survey.

Next, we describe the contents of the survey. The questionnaire items were questions related to the purpose of using music (see Table 1), music consumption means (see Table 2), and age and gender. These question items were presented to the

**Table 1** List of survey questions and summary statistics regarding the purpose of using music ( $N = 453$ ). These question items were presented to the subjects in Japanese

Category	Variable name	Question item	Mean	SD
Interpersonal relationships	Share music they would like	You want to share with someone the music that you think they would like	3.159	1.118
	Share the best music of all time	You want to share with someone the best music of all time	3.099	1.079
	Share good music	You want to share with someone the music that you think is good	3.139	1.160
	Interested in popular music	You are interested in popular music and like to listen to them	3.205	1.095
Personal identity	Look for unfamiliar music	You often look for music and artists that you are unfamiliar	2.797	1.096
	Come across music	You often come across music you don't know through radio programs or the autoplay feature of music streaming services	2.936	1.132
	Share music that is not widely known	You want to share with someone the music that is good but not widely known	2.903	1.099
Artist fans	Look for music that suit you	You often look for music and artists that suit your taste	3.181	1.104
	Check new music from favorite artists	You are always checking out new music from your favorite artists	3.285	1.115
	Share to support artists	You want to share with someone the music of your favorite artists as part of fan activities	3.062	1.097

**Table 2** List of survey questions and frequency of “use” answers regarding music consumption means ( $N = 453$ ). These question items were presented to the subjects in Japanese

Category	Variable name	Question item	Use	Use percentage
Means	Subscription	<Currently paying for the service> Please select each of the following music subscription services that apply to you	180	39.73
	Purchase	You purchase the CD	193	42.60
		You purchase a music DVD or Blu-ray	84	18.54
		You purchase a record	12	2.65
	Live	You purchase and listen/watch to music in other paid ways	71	15.67
		You go to an artist’s solo live/concert	141	31.13
	Rental	You go to a live/concert, where multiple artists perform (e.g., music festival)	32	7.06
		You rent a CD	91	20.09
	Free	You rent a music DVD or Blu-ray	24	5.30
		You listen to music on a free music/video streaming service	239	52.76
	You listen on free-to-air (e.g., AM/FM radio)	111	24.50	

subjects in Japanese (see Supplementary Information for Japanese). For the questions regarding the purpose of using music, four specific behavioral questions were asked, each corresponding to *interpersonal relationships* and *personal identity* in [8]. Moreover, two questions regarding the behavior of artists' fans were added. These were measured on a 5-point Likert scale.

In this study, music consumption means are classified into five categories: free, purchase, rental, live, and subscription. As mentioned earlier, our interest is in whether the means provided in the market are sufficient for the multiple roles that music inherently has. In this respect, the difference between using a little of each means or none at all is important. Therefore, questions on the use or non-use of several specific means belonging to these five categories were presented. If one or more of the specific means was used, it was interpreted as using that classification. Then, for each of the five means, the categorical variable of use or non-use is obtained. For accuracy in the question on subscription use, the respondents were asked to select the name of a specific music subscription service (e.g., Spotify) that they used. If one or more services name was selected, it was interpreted as using subscription.

At the time this survey was conducted in 2020, the spread of the COVID-19 infection had begun. To prevent the effect of COVID-19 on the survey, the phrase, "Please answer the following questions as per the pre-pandemic era" was included.

### 2.3 Analysis

First, an exploratory factor analysis was conducted on the answers to the purpose of using music, to obtain the constructs of the role expected of music. Then, a logistic regression model was used to analyze the factors affecting the choice of means. Here, the choice of the use of the five music consumption means was the dependent variable, and the constructs of the role expected of music, and gender and age were explanatory variables. The purposes of listening to music were considered as a factor in the choice of means, while age and gender were control variables.

## 3 Results

### 3.1 Demographics Data

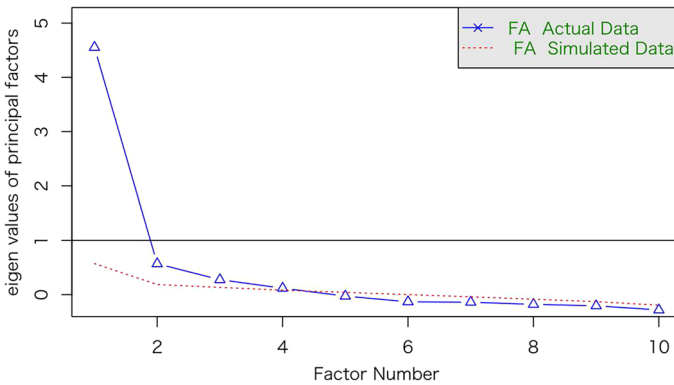
The screening survey had 10,552 respondents and the main survey had 437 respondents. Among the 10,552 respondents, there were 8878 respondents after excluding those who do not listen to music at all. In main survey, we sampled about 200 each from these 8878 respondents who had and had not used subscriptions. Table 3 shows the demographic profile of the respondents.

### 3.2 Exploratory Factor Analysis

The number of factors determined by parallel analysis was four (Fig. 1). These four factors are referred to as F1–F4. Then, the factor analysis was estimated using

**Table 3** Demographics of respondents in the screening survey and the main survey. The numbers in the screening survey are approximate estimates calculated from a frequency distribution table

Use experience	Number(Man)	Number(Woman)	Age(Mean)	Age(SD)
Screening survey				
Subscription user	1397	1167	38.17	14.78
Non-subscription user	3013	3301	44.36	14.84
Main survey				
Subscription user	124	102	38.54	15.12
Non-subscription user	107	120	44.13	15.15



**Fig. 1** Parallel analysis scree plot. The number of factors before which the plot of the actual data is lower than the simulated plot of the random normal data set at the same sample size was adopted to be 4

**Table 4** Factor loadings obtained as a result of exploratory factor analysis. Bolded letters denote the maximum factor loadings in each variable

Variables	F1	F2	F3	F4
Share music they would like	<b>0.868</b>	-0.003	-0.017	0.034
Share the best music of all time	<b>0.805</b>	-0.050	0.037	-0.026
Share good music	<b>0.641</b>	0.080	0.110	0.085
Interested in popular music	<b>0.458</b>	0.220	0.140	-0.395
Look for unfamiliar music	-0.066	<b>0.753</b>	0.155	0.024
Come across music	0.281	<b>0.531</b>	-0.151	-0.105
Share music that is not widely known	0.304	<b>0.461</b>	-0.016	0.395
Check new music from favorite artists	0.083	0.013	<b>0.726</b>	0.010
Look for music that suit you	-0.025	0.458	<b>0.459</b>	-0.055
Share to support artists	0.383	0.083	0.286	<b>0.422</b>

the Oblimin rotation, a type of oblique rotation, and the least residual method. The results are shown in Table 4.

For F1, the four items with the largest factor loadings are all related to *interpersonal relationships*. Thus, F1 is referred to as *expectations for interpersonal relationships*. For F2, the three items with the largest factor loadings are all items related to *personal identity*. The other item related to *personal identity* is *look for music that suits you*, which has a factor loading as high as that of F2 and F3. For these reasons, we refer to F2 as *expectations for personal identity construction*. F3 has large factor loadings on *look for music that suits you* and *check new music from favorite artists*. This can be interpreted as a factor to search for music that suits oneself based on favorite artists and to construct an identity as a fan of those artists. Therefore, we refer to F3 as *Expectation to construct fan identity*. For F4, the item *share to support artists* corresponds. In addition to that, the items *share music that is not widely known* and *interested in popular music* have positive and negative factor loadings of non-negligible magnitude, respectively. This can be interpreted as a factor that supports the artist for the construct of identity as a fan of a minor artist. Thus, we refer to F4 as *expectation of artist contribution*.

Cronbach's alpha is a measure of internal consistency reliability [3]. For the each factor, the Cronbach's alpha was calculated for the group of variables with the largest factor loadings. The results were 0.82 for F1, 0.73 for F2, and 0.72 for F3. F4 was not calculated, because there is only one variable with the largest factor loadings.

The correlation matrix for the obtained 4 factor scores and age is shown in Table 5. Relatively large correlation coefficients in the 0.5 range were identified for F1–F2 and F2–F4, respectively.

### 3.3 Logistic Regression Analysis

Logistic regression analysis was performed to investigate the effects of the four constructs from the exploratory factor analysis on the use of music consumption means. The explanatory variables were factor scores of the four constructs, gender, and age. Gender was used as a dummy variable with 0 for males and 1 for females, and age was used as a continuous variable. Results are shown in Table 6. Here,  $R^2$  is Nagelkerke's R squared.

Results show that for subscription use, only F2: *Expectation of personal identity* is statistically significant. For purchase and live use, F3: *Expectation of fan identity*

**Table 5** Correlation matrix of factor scores and age

Variables	F1	F2	F3	F4	Age
F1	1	0.566***	0.271***	0.454***	-0.237***
F2		1	0.130**	0.592***	-0.207***
F3			1	0.138**	-0.026
F4				1	-0.271***
Age					1

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$



**Table 6** Regression coefficients and Nagelkerke's R squared values obtained from logistic regression analysis

	Model 1 subscription	Model 2 purchase	Model 3 live	Model 4 rental	Model 5 free
Coef.					
Intercept	0.088	-0.651*	-1.594***	-1.218***	0.140
F1	-0.014	-0.214	-0.084	0.084	0.234
F2	0.444**	-0.121	0.010	0.139	-0.149
F3	0.045	0.255*	0.473***	0.102	0.095
F4	0.023	0.764***	0.824***	0.028	0.089
Gender	-0.174	0.084	0.730**	-0.217	0.083
Age	-0.011	0.009	0.007	-0.000	0.004
R <sup>2</sup>	0.082	0.126	0.225	0.020	0.022

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

*construction* and F4: *Expectation of artist contribution* are statistically significant contributors, respectively. For live use, in particular, the contribution from both F3 and F4 are both larger than for purchase, and being female is also a statistically significant contributor. For rental and free use, we could not identify any factors contributing to statistical significance at the 5% level.

## 4 Discussion

First, exploratory factor analysis identified two factors consistent with [8]: *expectations for interpersonal relationships* and *expectations for personal identity construction*. Regarding identity construction, two separate factors were obtained as *expectations for personal identity construction* and *expectations for fan identity construction*. This was possibly influenced by fandom as a distinctive Japanese popular culture as pointed out in [12], and the factor of *expectations for fan identity construction* could be a factor unique to Japan. Another construct related to fans, *expectations for artist contribution*, was obtained, indicating that the psychology of minor artists' fans differs from that of other fans.

Logistic regression analysis obtained the constructs that affect subscription, purchase, and live usage. Only F2: *Expectations of personal identity construction* contributes statistically significantly to the use of subscription, but it does not contribute to the use of the other means. This suggests that the advent of subscription to the music market has facilitated music's role in *personal identity construction*. This appears to be because subscriptions, which offer unlimited listening, provide a low-cost means of song discovery, consistent with the results of [4]. In addition, [2, 4, 5] suggest that the use of free music consumption means may also increase music consumption diversity. However, in this study, there is no statistically significant contribution from F2: *Expectations of personal identity construction* to free usage. This could be due to the reduced convenience of free music streaming services

with limited functions (e.g., not being able to skip, displaying advertisements, etc.). Although legal free music services exist, subscriptions seem to be more attractive to consumers who use music to construct their personal identity.

For both purchase and live use, there were contributions from two constructs: *expectation of fan identity construction* and *expectation of artist contribution*. The contribution from both constructs was larger for live usage, which indicated that live is particularly important to artist fans. This result was reasonable, since live performances are considered to be a place to support artists and to communicate with other fans. We also found that being female contributed to the use of live, confirming a statistically significant effect from the demographic variables. The culture of female fans in Japanese popular music is unique [10], and the results of our study may be influenced by this background.

The construct of *expectations for interpersonal relationships* did not show a statistically significant effect on any of the five means. This suggests that the major means in the current music market may be unattractive to music listeners who value communicating with others through music, and that there is a need for another means to satisfy their demand.

Finally, we mention the limitations and future prospects. Although this study focused on the Japanese music market, it is possible that there are country-specific differences. In particular, constructs related to fans may not be detected in other countries or may appear in other forms. Studying differences and similarities among countries is important for understanding the development of music culture. Regarding the means of listening to music, we adopted five categories that cover the means that are considered major in the modern music market, but it is likely that the diversification of means will continue in the future. Particularly with respect to free use, like music consumption on social networking services, new insights may be gained by subdividing the means. Although the effects of COVID-19 are outside the scope of this study's interest, it might be interesting to determine its long-term and short-term effects on music consumption behavior in future studies.

## 5 Conclusions

In this study, we revealed the relationship between the role expected from music and the choice of music consumption means. The results supported that subscriptions facilitate music's role in *personal identity construction*. In addition, to the use of live and purchase, there were contributions from two constructs related to fans. These results indicated that in the music market, subscription is not a replacement for the existing means, but that its role is shared with other means, providing new value. Therefore, in the future music market, subscription will not completely replace the existing means of purchase and live, and the market share of subscription will be saturated. This study also showed that the music market may not be providing the necessary music consumption means for consumers who have expectations of interpersonal relationships in their music consumption.

The result that only the role of music, *personal identity construction*, contributes to subscription use also has implications for a business perspective. Because

subscription-based streaming services are gradually reaching maturity in the music market, they need to differentiate themselves from other services. In this context, in addition to *personal identity construction*, other roles should also be required.

Moreover, the results of this study provide important insights when analyzing people's music consumption behavior. For example, they suggest that there is a bias among subscription users, wherein many of them have *expectations of personal identity construction*. It is also possible that in the modern music market, two constructs contribute to purchases, which can be successfully understood by decomposing purchasing behavior into two categories. Thus, it is important to consider the purpose of a person's behavior when analyzing it. The analysis conducted in this study also serves as a preliminary analysis before focusing on specific means of music consumption.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s12626-022-00115-x>.

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## Declarations

**Conflicts of Interest** Yukie Sano has no conflicts of interest to declare. Makoto Takeuchi and Soichiro Morishita are employees of CyberAgent, Inc. There are no patents to declare.

**Informed Consent** All data that are presented to researchers are pre-anonymised by the survey company. The participants of the study were informed about purpose of the study, procedure, risks of being in the study, potential benefits, anonymity and voluntary nature of the study and their consent was obtained.

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