

Gamification in Marketing: An Empirical Study of Differences in User Psychology Among Services Using Gamification

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ABSTRACT

Attention has focused recently on the use of game mechanisms (gamification) for marketing purposes in fields other than gaming. The objective of this research is to investigate differences in user psychology among industry categories and services that use gamification in their marketing. To achieve this objective, a survey was administered to the users of four services: two that support runners, and two that support learning. Analyses of and comparisons between the two industry categories, and among the four services, were carried out. The three main findings can be summarized as follows. 1) The effects of a flow experience on the intention to continue in the activity, and on favorable feelings toward the brand that is providing the gamification, differ according to the service. 2) Favorable feelings toward the brand differ according to the service and are enhanced through a number of factors. 3) This is thought to be the result of different levels of positive attitude between categories toward the activity, and differences in effects among the factors.

Keywords: marketing, consumer behavior, gamification, flow experience, empirical research

JEL Classification Numbers: M15, M31

1 Introduction

In previous research and the literature on gamification, certain instances of consumer behavior have come to the fore—such as the user’s voluntary participation and his or her passionate and continued use of a service or product—as well as evidence that the purchase and use of brands that leverage gamification influence these behaviors. As a result, there are now expectations that gamification could be used as a new marketing method, and it so it began to be used for this purpose.

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When positioning gamification as a marketing strategy, it is possible to clarify the effects of each instance of gamification by undertaking analysis that asks the question: “What are the differences in the causal relationships between user psychology and consumer behavior, among individual services that use gamification—and what are the factors behind these differences?”

This study investigated the mechanisms through which services that use gamification can have an effect on users, in order to clarify the answer to this research question. To do so, focus was placed on changes to consumer psychology that produce results for the party that leverages the gamification. We conducted a survey and analysis, both of which were based on the key concept of the “flow experience”—an all-encompassing feeling that people experience when immersing themselves completely in an action (Csikszentmihalyi, 1975).

2 Previous research on the user psychology of gamification

The game mechanisms and elements incorporated into gamification have been discussed widely, but not clarified, in a number of research papers and pieces of literature. For example, according to Zichermann and Cunningham (2011), there are points and levels, leaderboards, badges, on-boarding (such as through a simple tutorial), challenges and quests, and social engagement loops; meanwhile, according to Ryan et al. (2013), there are statuses, milestones, competition, ranking, social connectedness, immersion reality, and personalization. Research into user psychology is currently investigating not only individual game mechanisms and elements, but also mechanisms and elements in general, while attempting to ascertain universally and generally the effects of gamification.

The psychological states that gamification activates within the user have been identified; they include enjoyment (e.g., Montola et al. 2009; Brauner et al. 2013), motivation (e.g., Fitz-Walter et al. 2011), and engagement (e.g., Flatla et al. 2011; Li et al. 2012). To investigate the relationship between psychology and behavior, Montola et al. (2009) also conducted an experiment in which a points system was installed into a photo-sharing service. The service generated user enjoyment and friendly competition among users. Li et al. (2012) conducted an experiment using computer-aided design, which incorporated gamification; they clarified that users felt a high degree of engagement with the service, which in turn brought about improvements in the speed of completion and a higher completion rate.

The investigative methods used in empirical research into the psychology of gamification users include experiments such as these, as well as investigations that analyze data on the actual use of gamification. That research investigates single services and attempts to derive industry-wide findings. Amongst those studies that researched industry categories was that of Hsu et al. (2013)—which, in areas such as entertainment, education, and business, created game mechanisms and elements that leverage gamification on a story-telling site that told stories in terms of reality versus imagination. Through group interviews

and analysis, they found that among 35 elements surveyed, the 10 most popular ones accounted for 50% of the appeal of the service.

Kim (2013) investigated the top five items in terms of user enjoyment and pleasure, among the male and female users of a service. The top five items among men were challenge, completion, exploration, relaxation, and simulation, while those among women were exploration, relaxation, discovery, completion, and fantasy; these findings demonstrate that there are psychological differences between men and women in terms of their antecedents to feelings of enjoyment. However, to the best of our knowledge, no study has investigated difference in the effects of gamification among categories, or among services within the same category. The current study looks to fill that research gap.

3 The empirical study

3.1 Objective of the survey

The objective of the survey used in the current study was to clarify, for marketing purposes, any differences in user psychology (such as differences in attitudes toward, and purchases of, the brands providing gamification) generated by categories of services that incorporate gamification, and the services within these categories. This study also sought to clarify the presence and extent of differences in the causal relationships between user psychologies and the factors behind them.

3.2 The two categories, four services, and survey subjects addressed in this study

The survey subjects in this survey are users of services that incorporate gamification that can be operated in Japanese. In this research, two categories of services are considered as representative of industry categories that make use of gamification in marketing—namely, running support services and learning support services. The subjects of the survey were all users of running support services (Service A or B) or learning support services (Service C or D). Services A–D are managed by Company A (in the United States), Company B (Japan), Company C (Japan), and Company D (the United States), respectively.

All the services are available through a free smartphone app and websites that can be used by electronic devices, all of which were prepared by the management company. All of the services have been frequently cited in previous research and the literature as examples of services that use gamification by incorporating game elements (e.g., Zichermann and Cunningham 2011; Werbach and Hunter 2012). Specifically, they incorporate elements such as points, levels, leaderboards, badges, ease of operation, challenges, quests, and Internet and SNS functions.

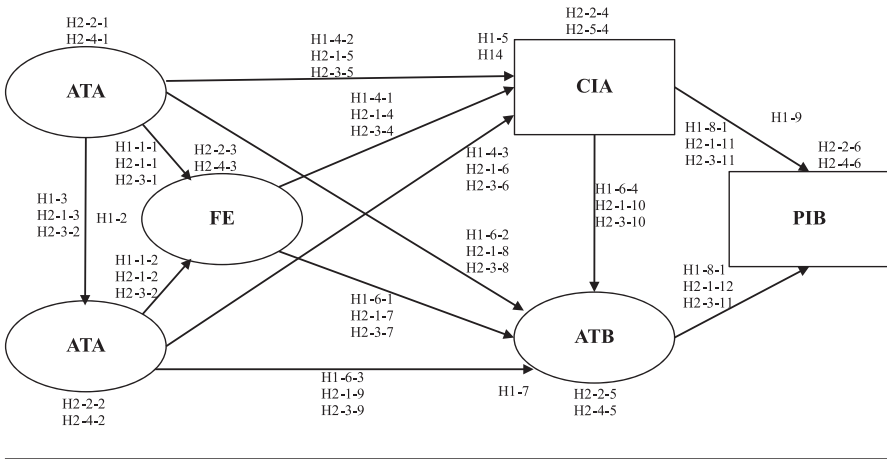
Only the use of Service D incurs a cost, in the form of a monthly fee. Services A and B require users to own the service's running products, such as running shoes, but they are indifferent to the use of products from other companies; only Company A requires users to attach an electronic device to the running shoes. In Service C, the users themselves register the learning materials sold by various companies, such as those for qualifications and exams, while in Service D, they use the service's original English conversation teaching materials. Even though the products handled by Company A and Company B are practically the same, their brands are different. According to the results of a survey on "favorite sports brand," there were differences in the related brand images: the U.S. brand of Company A was ranked as the most popular among respondents aged less than 40 years, while the Japanese brand of Company B was ranked as the most popular among respondents aged 40 years and over (Nikkei BP Consulting 2012; Macromill and Mitsubishi UFJ Research and Consulting 2013).

By using gamification, Service A increased its member numbers worldwide by 40%, compared to the previous year (2011); meanwhile, sales of its running products rose by 30% (Ryan et al. 2013). In the last few years, the number of users of Service B has increased multiple times, while that of Service C grew around fivefold in one year from 2012, without advertising, and now has in excess of 300,000 members. Service D, a learning support service, had more than 1.2 million registered users as of 2013. (These figures are based on announcements made by the respective companies themselves.)

While there are various differences among these services—including those that pertain to the services themselves and the user interface they offer—all appear to have increased their value by using gamification to provide users with running and learning opportunities, and with the ability to enhance the enjoyment of these activities. In addition, given the users' voluntary participation and their passionate and continued use of these services, it appears that gamification activates the psychological states of absorption, concentration, and immersion in users.

3.3 The hypotheses

The products that the subjects used were considered to have a functional value that assisted in executing the activity: in the case of running, the products were items such as shoes and clothes, and for studying, the products were learning materials. The hypotheses derive from this premise. We considered it likely that there were causal relationships among six factors—namely, attitude toward the activity (ATA), impression of the game elements and mechanisms incorporated into the service that uses gamification (ITG), the flow experience from the use of a service that uses gamification (FE), continued intention to take part in the activity (CIA), attitude toward the brand providing the service that uses gamification (ATB), and purchase intention for the brand (PIB).

Figure 1. The hypothesized causal structural model.

Additionally, a psychological causal structural model was created, based on the hypotheses (Figure 1). In cases where the scale used at the time the variables were investigated was thought to have multiple factor structures, it was adjusted at the analysis stage.

3.3.1 Investigation of the effects of each category and service

Choi and Kim (2004) demonstrated that in games, the ITG connects to consumer psychology and consumption behavior toward the game itself—such as favorable feelings toward the game and its use—through the effect of the FE on the user. Ishimura (2008) showed that FEs are generated from running, learning, and other activities in daily life. It is necessary to understand the structure of the effects on the FEs of gamification services that combine game and non-game mechanisms and elements. Based on this, three hypotheses were established—namely, one on the respective effects of ATA and ITG on FE (H1-1), one on the differences in the strengths of each of the effects (H1-2), and one on the effects of ITG on ATA (H1-3).

Moreover, an expected effect arising from the use of gamification—for example, using the running products when running, or learning materials when learning—is that it will lead to continuation of the activity, given the product's functional value in assisting with the activity. Therefore, a hypothesis was established to ascertain, in turn, the structure of the effects of FE, ATA, and ITG on CIA (H1-4). In addition, within the literature—including the work of Zichermann and Cunningham (2011)—it is thought that (as is the case with games) gamification generates FEs, and that this promotes the user's consumption-oriented psychology. Therefore, we also established a hypothesis on the differences in the respective strengths of this effect (H1-5).

In addition, Nojima (2012) showed that, in online games, game characteristics are related to satisfaction level—and that this, in turn, relates to the consumer's psychology and behavior and increases the frequency of game use. In the current study, the focus is on consumer psychology and consumer behavior toward products that use gamification; therefore, it is necessary to investigate their effects on users' attitudes and on PIB towards the brand that offers the gamification. To investigate this, we established a hypothesis vis-à-vis the effects of each of FE, ATA, ITG, and CIA on ATB (H1-6) and a hypothesis on differences in their respective impacts on the effects of the FE (H1-7). A hypothesis on the effects of each of CIA and ATB on PIB was also established (H1-8). In addition, as the attitude toward a brand relates straightforwardly to the PIB of that brand, we established a hypothesis vis-à-vis differences in their respective effects (H1-9).

In summary, we established a total of nine hypotheses, as listed below.

- H1-1: ATA and ITG each has a positive effect on FE.
- H1-2: ITG has a stronger positive effect on FE than does ATA.
- H1-3: ATA has a positive effect on ITG.
- H1-4: FE, ATA, and ITG each has a positive effect on CIA.
- H1-5: FE has the strongest positive effect on CIA.
- H1-6: FE, ATA, ITG, and CIA each has a positive effect on ATB.
- H1-7: FE has the strongest positive effect on ATB.
- H1-8: CIA and ATB each has a positive effect on PIB.
- H1-9: ATB has the strongest positive effect on PIB.

3.3.2 Investigation of the effects of differences among categories, and differences among services within the same category

Multiple categories and services were investigated and compared, and the presence or absence of differences in actions based on user psychology, as well as the factors underlying the magnitude of these differences, were investigated.

We considered that causal relations were likely to be stronger in running support services than in learning support services, and likely to occur at a higher level (H2-1, H2-2).

In addition, for both running support services and learning support services, we considered it likely that individual differences would appear among the services, despite the fact that the activities and objectives therein were similar. We believe these differences to be due, first, to the differences in the users' attitudes and beliefs toward the original brand (which relates to the differences in user types) and, second, to differences in how the services' mechanisms and elements are understood. From these viewpoints, we created two hypotheses that took into consideration that Japan was the location of the survey (H2-3, 2-4). For each of the hypotheses, the two running support services and the two learning support services were investigated.

In summary, we established four additional hypotheses, as listed below.

- H2-1: The positive effects between each of the factors are stronger in the running support services than in the learning support services.
- H2-2: The factor levels are higher in the running support services than in the learning support services.
- H2-3: The positive effects between each of the factors are stronger for the Japanese services than for the U.S. services.
- H2-4: The factor levels are higher for the Japanese services than for the U.S. services.

3.4 The scale

We prepared survey question items to which the respondents provided answers, via a seven-point Likert scale anchored by 1 (“Does not apply to all”) and 7 (“Applies extremely well”).

3.4.1 *Attitude toward the activity (ATA)*

There were two question items (“I think it is a fit for me” and “I like it”) about running (for the running support services) and learning (for the learning support services).

3.4.2 *Impression of the game elements and mechanisms within the service (ITG)*

We prepared a gamification scale containing nine items, with reference to services within a gamification framework in practical terms (e.g., Zichermann and Cunningham 2011; Werbach and Hunter 2012): 1. “I feel happy when I receive something”; 2. “I feel this is right for me”; 3. “I feel that it is competitive”; 4. “I feel that it is self-expression”; 5. “I feel that it is possible to work easily”; 6. “I feel a sense of achievement”; 7. “I feel connections with other people”; 8. “I feel that I am skillful”; and 9. “I feel that the appearance of devices, such as smartphones and PCs, is interesting”. Hamada (2013) also used this scale, and its reliability has been confirmed. It comprises two factors. The first factor is “competition and self-expression,” which has five items that relate to competition, self-expression, and connecting to other people (items 1, 2, 3, 4, and 5); the second factor is “ease of understanding and sense of achievement,” which has four items that relate to a sense of achievement and operability (items 6, 7, 8, and 9).

3.4.3 *Flow experience (FE)*

The current study makes use of the 10-item FE checklist created by Ishimura (2008): 1. “I feel my work is challenging”; 2. “I am confident in managing matters”; 3. “I am making progress toward reaching my goals”; 4. “everything is

going well”; 5. “I am in a state of complete concentration”; 6. “I am in control of my behavior/movements”; 7. “I am completely immersed”; 8. “I am able to control situations”; 9. “I feel that time flies”; and 10. “I am enjoying my work”. This scale has been used in research on FEs in daily life (e.g., Hirao et al. 2012; Kaida et al. 2012), and we considered that each question item was consistent with the survey items used in the current study.

However, while there was a three-factor structure in Ishimura (2008) (i.e., “confidence in competence,” “rise to a challenge,” and “positive emotion and absorption”), in Hamada (2014), the scale was separated into two factors—namely, “challenge,” which pertained to five items that related to goals and challenges (items 1, 2, 3, 4, and 10), and “absorption,” which pertained to four items on a sense of absorption and concentration (items 6, 7, 8, and 9). Hamada (2014) confirmed the reliability of the two-factor structure, and so it was used in the current study.

3.4.4 Continued intention to take part in the activity (CIA)

One question item, “I think I want to continue in the future,” pertained to running for the running support services, and to learning for the learning support services.

3.4.5 Attitude toward the brand providing the gamification-based service (ATB)

Two question items (“It is a fit for me” and “I like it”) pertained to the brand products provided by the company managing the running support services, and to the learning materials used in the learning support services.

3.4.6 Purchase intention for the brand (PIB)

One question item (“I think I want to buy it in the future”) pertained to the brand products provided by the company managing the running support services, and to the learning materials used in the learning support services.

3.5 Sequence of events and survey period

The survey was implemented between September 24 and November 20, 2013 as an online questionnaire survey, in concert with the market research company Macromill. First, we screened the identified service users to be questioned at the time the survey was to be implemented, and selected users who matched the selection criteria of the intended subjects. Next, we executed the survey, using the aforementioned prepared scales.

4 Analysis and results

Responses were received from male and female survey respondents in Japan aged 18–49 years. There were 671 respondents for Service A, and 309 respondents for each of Services B, C, and D. All respondents were required to have carried out the related activity at least once per month in the six months prior to the survey; they were also required to have used the relevant service each time they carried out the activity. We reviewed the responses and found there to be no invalid responses. First, the responses of 309 people were extracted randomly from among the respondents for Service A (Note 1), and the same number of responses was selected for the three other services. Second, the running support services respondents ($N = 618$) were separated from the learning support services respondents ($N = 618$), and each group was analyzed. Finally, each of the four services ($N = 309$ each) was analyzed individually.

In the analysis, the causal model for the hypotheses was confirmed through structural equation modeling (SEM). In doing so, we confirmed the reliability of each scale, along with the levels of the observation variables. The levels were confirmed through *t*-tests. IBM SPSS Statistics v21 (IBM, Armonk, New York, USA) and IBM SPSS AMOS v21 (IBM, Armonk, New York, USA) were used for the analysis.

The Cronbach's alpha (α) coefficient was calculated for the answers from all the survey respondents ($N = 1,236$). ATA was $\alpha = .894$, ITG "competition and self-expression" was $\alpha = .879$, ITG "ease of understanding and sense of achievement" was $\alpha = .846$, FE "challenge" was $\alpha = .912$, FE "absorption" was $\alpha = .893$, and ATB was $\alpha = .905$. As each of these values exceed the alpha coefficient of .700—which is considered sufficient by Nunnally and Bernstein (1994)—we ascertained that we could proceed with the analysis.

4.1 The t-test

The differences between the running support service and the learning support service categories, between the two running support services, and between the two learning support services were compared by testing differences in the mean values of the subscale scores for each factor.

First, a *t*-test was carried out for the running support and learning support services (Table 1). The mean values of the subscale scores for ATA, ATB, and PIB were significantly higher for the running support services than for the learning support services. No other significant differences were observed.

Next, a *t*-test was carried out between the two running support services, and between the two learning support services (Tables 2 and 3, respectively). The mean value of the subscale scores of ITG, as well as that of its factor of "competition and self-expression" in the running support services, was significantly higher for Service B than for Service A. In the learning support services, it was

Table 1. Results of t-test of the mean values of the subscale scores for running support services and learning support services.					
	Running support services (N = 618)		Learning support services (N = 618)		t-ratio
	Mean	Standard deviation	Mean	Standard deviation	
ATA	5.229	1.237	5.054	1.371	2.353*
ITG	4.527	1.020	4.557	1.129	.496 ^{n.s.}
ITG “competition and self-expression”	4.306	1.132	4.330	1.272	.350 ^{n.s.}
ITG “ease of understanding and sense of achievement”	4.803	1.060	4.841	1.145	.612 ^{n.s.}
FE	4.672	1.108	4.680	1.146	.121 ^{n.s.}
FE “challenge”	4.818	1.200	4.873	1.225	.798 ^{n.s.}
FE “absorption”	4.526	1.138	4.487	1.212	.591 ^{n.s.}
ATB	5.175	1.227	5.014	1.226	2.308*
CIA	5.417	1.285	5.314	1.349	1.382 ^{n.s.}
PIB	5.167	1.333	4.715	1.376	5.859***
<i>P</i> = * < .05, *** < .001, and ^{n.s.} = not significant.					

significantly higher for Service C than for Service D. No other significant differences were observed.

4.2 Structural equation modeling (SEM)

SEM was performed through simultaneous analyses of the four services, in order to investigate the presence or absence, and the strength or weakness, of the effects of each factor; this was undertaken concurrently with analyses of the similarities and differences between the running support services and learning support services categories. The hypothesized causal model was used and analyses performed. In this case, considering goodness of fit, the two FE factors were used unchanged, and the ITG factors of “ease of understanding and sense of achievement” were removed.

Table 2. Results of t-test of the mean values of the subscale scores of Service A and Service B.

	Service A (N = 309)		Service B (N = 309)		t-ratio
	Mean	Standard deviation	Mean	Standard deviation	
ATA	5.212	1.147	5.246	1.323	.341 ^{n.s.}
ITG	4.413	.927	4.641	1.095	2.793**
ITG "competition and self-expression"	4.155	1.040	4.458	1.200	3.353**
ITG "ease of understanding and sense of achievement"	4.735	.986	4.870	1.127	1.577 ^{n.s.}
FE	4.655	1.027	4.690	1.185	.388 ^{n.s.}
FE "challenge"	4.825	1.123	4.812	1.275	.141 ^{n.s.}
FE "absorption"	4.485	1.065	4.568	1.207	.905 ^{n.s.}
ATB	5.421	1.229	5.414	1.340	.063 ^{n.s.}
CIA	5.083	1.161	5.267	1.285	1.873 ^{n.s.}
PIB	5.136	1.277	5.197	1.388	.573 ^{n.s.}
P = ** < .01, and ^{n.s.} = not significant.					

4.2.1 Multiple population simultaneous analysis (two categories)

First, analysis of the different effects between each factor was carried out (Figure 2) (Note 2). Next, differences in the path coefficients for the same path for both categories were tested and compared (Table 4). Then, differences in the path coefficients between the paths for each of the respective categories were tested and compared (Table 5).

4.4.2 Multiple population simultaneous analysis (four services)

First, we analyzed the different effects of each factor (Figure 3) (Note 3). Next, we tested and compared the differences in the path coefficients for the same path, for the two services in each of the categories (Table 6). Finally, we tested and compared the differences in the path coefficients for each of the four services (Table 7).

Table 3. Results of t-test of the mean values of the subscale scores of Service C and Service D.

	Service C (N = 309)		Service D (N = 309)		t-ratio
	Mean	Standard deviation	Mean	Standard deviation	
ATA	5.010	1.426	5.099	1.314	.807 ^{n.s.}
ITG	4.669	1.131	4.445	1.117	2.477*
ITG “competition and self-expression”	4.518	1.209	4.142	1.308	3.781***
ITG “ease of understanding and sense of achievement”	4.858	1.169	4.824	1.122	.360 ^{n.s.}
FE	4.709	1.164	4.651	1.130	.635 ^{n.s.}
FE “challenge”	4.876	1.247	4.871	1.204	.059 ^{n.s.}
FE “absorption”	4.542	1.229	4.431	1.194	1.142 ^{n.s.}
ATB	5.262	1.419	5.366	1.276	.954 ^{n.s.}
CIA	5.005	1.274	5.023	1.178	.180 ^{n.s.}
PIB	4.786	1.432	4.644	1.315	1.287 ^{n.s.}

P = * < .05, *** < .001, and ^{n.s.} = not significant.

Figure 2. Path diagram for running support services and learning support services.

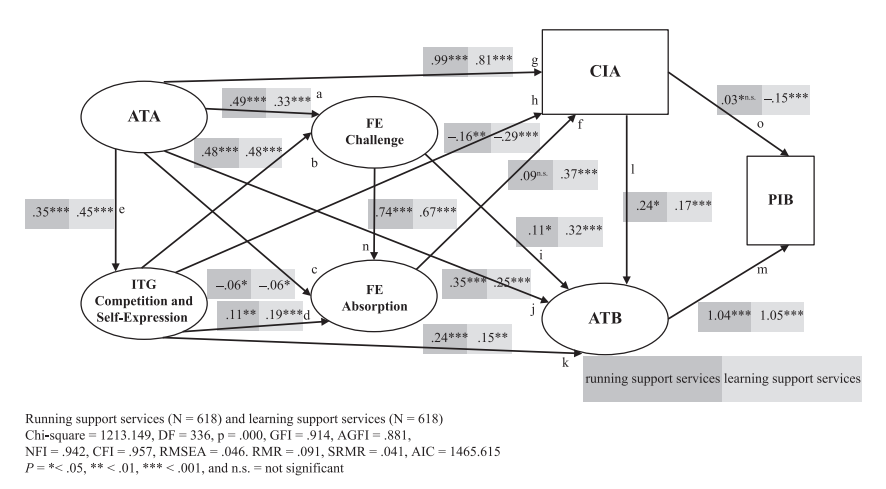


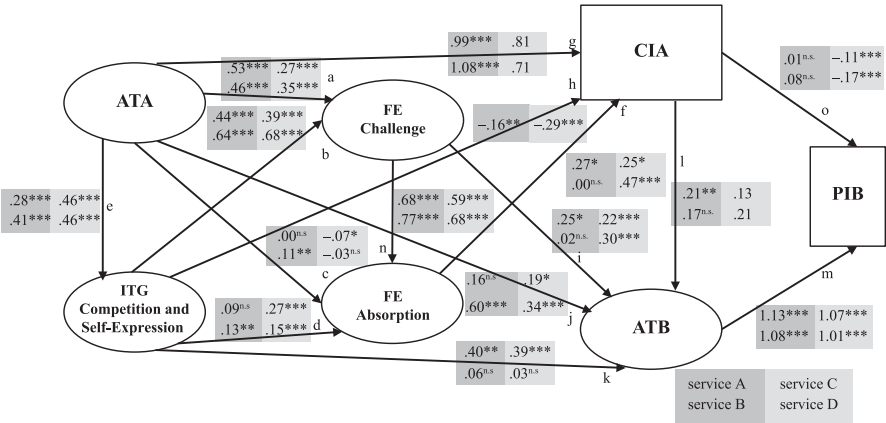
Table 4. Results of test of the differences for the same path between the running support services and learning support services

Path	Running support services (N = 618) Learning support services (N = 618)
a	-2.872***
g	-3.126***
i	3.304***
$P = *** < .001$.	

Table 5. Results of test of the differences between paths for the running support services and learning support services.

		Running support services (N = 618)	Learning support services (N = 618)
Effect on FE "Challenge" and FE "Absorption"	a c	-10.233***	-8.270***
	a d	-6.872***	-2.899***
	b c	-6.594***	-8.749***
	b d	-3.314***	4.919***
	c d	-3.314***	-5.477***
Effect on CIA	f g	n.s. (Path f)	4.735***
	f h	n.s. (Path f)	-5.517***
	g h	-14.237***	-13.598***
Effect on ATB	i j	2.340**	-.883 ^{n.s.}
	i k	1.471 ^{n.s.}	-2.031*
	i l	-1.889 ^{n.s.}	2.083*
Effect on PIB	m o	n.s. (Path o)	-14.935***
$P = * < .05$, $** < .01$, $*** < .001$, and ^{n.s.} = not significant.			

Figure 3. Path diagram for the four services.



Service A (N = 309), service C (N = 309), service B (N = 309), and service D (N = 309)
Chi-square = 1859.210, DF = 692, p = .000, GFI = .878, AGFI = .838,
NFI = .914, CFI = .944, RMSEA = .037, RMR = .100, SRMR = .048, AIC = 2323.210
P = * < .05, ** < .01, *** < .001, and n.s. = not significant

Table 6. Results of test of the differences for the same path between the two services in each of the categories.		
Path	Running support services Service A (N = 309) Service B (N = 309)	Learning support services Service C (N = 309) Service D (N = 310)
b	-1.075 ^{n.s.}	-2.363**
g	2.853***	-2.335**
P = ** < .01, *** < .001, and ^{n.s.} = not significant.		

5 Verification of the hypotheses

We examined the results of the survey and analysis to determine whether or not they support our hypotheses regarding the running support services and the learning support services (Table 8) and the four individual services (Table 9). Next, hypotheses concerning comparisons between categories and differences between each factor in each of the categories were verified (Table 10). Finally, the hypotheses regarding comparisons of services within the same category were verified (Table 11).

Table 7. Results of test of the differences between the paths for each of the four services.

		Service A (N = 309)	Service B (N = 309)	Service C (N = 309)	Service D (N = 309)
Effect on FE “Challenge” and FE “Absorption”	a b	.631 ^{n.s.}	-.092 ^{n.s.}	3.218***	.280 ^{n.s.}
	a c	n.s.(Path c)	-7.345***	-5.583***	n.s.(Path c)
	a d	n.s.(Path d)	-4.540***	.057 ^{n.s.}	-2.990***
	b c	n.s.(Path c)	-5.243***	-7.301***	n.s.(Path c)
	b d	n.s.(Path d)	2.806***	4.196***	2.916***
	c d	n.s.(Path c,d)	-3.486***	-2.663***	n.s.(Path c)
Effect on CIA	f g	3.654 ^{n.s.}	n.s.(Path f)	4.724***	1.781 ^{n.s.}
	f h	n.s.(Path h)	n.s.(Path f)	n.s.(Path h)	-5.180***
	g h	n.s.(Path h)	-12.051***	n.s.(Path h)	-8.977***
Effect on ATB	k l	-4.741***	n.s.(Path k,l)	n.s.(Path l)	n.s.(Path k)
Effect on PIB	m o	n.s.(Path o)	n.s.(Path o)	-10.507***	-10.608***
P = *** < .001, and ^{n.s.} = not significant.					

6 Discussion

6.1 Comparisons by category

First, it is important to note that the effects of ATA on CIA were significantly higher, as positive values, for running support services than for learning support services. The significantly higher level of ATA for running support services relative to that of learning support services indicates that the characteristics of the activity of running itself encourage the users to continue in that activity. It appears that through the act of running, users experience something referred to as “runner’s high,” and so the activity itself promotes its continuation.

Second, it is also important to note that the effects of FE “Challenge” on ATA for running support services were significantly stronger than those for learning support services. The significantly higher level of ATA for running support services, compared to that of learning support services, indicates that

Table 8. Verification of the hypothesized causal structural model for the running support services and the learning support services.

		Hypothesis	Running support services	Learning support services
H1-1		ATA and ITG each has a positive effect on FE.	Supported	Supported
	H1-1-1	ATA has a positive effect on FE	Supported	Supported
	H1-1-2	ITG has a positive effect on FE	Supported	Supported
H1-2		ITG has a stronger positive effect on FE than does ATA.	Not supported	Not supported
H1-3		ATA has a positive effect on ITG.	Supported	Supported
H1-4		FE, ATA, and ITG each has a positive effect on CIA.	Not supported	Not supported
	H1-4-1	FE has a positive effect on CIA	Not supported	Supported
	H1-4-2	ATA has a positive effect on CIA	Supported	Supported
	H1-4-3	ITG has a positive effect on CIA	Not supported	Not supported
H1-5		FE has the strongest positive effect on CIA.	Not supported	Not supported
H1-6		FE, ATA, ITG, and CIA each has a positive effect on ATB.	Supported	Supported
	H1-6-1	FE has a positive effect on ATB	Supported	Supported
	H1-6-2	ATA has a positive effect on ATB	Supported	Supported
	H1-6-3	ITG has a positive effect on ATB	Supported	Supported
	H1-6-4	CIA has a positive effect on ATB	Supported	Supported
H1-7		FE has the strongest positive effect on ATB.	Not supported	Not supported
H1-8		CIA and ATB each has a positive effect on PIB.	Not supported	Not supported
	H1-8-4	CIA has a positive effect on PIB	Not supported	Not supported
	H1-8-5	ATB has a positive effect on PIB	Supported	Supported
H1-9		ATB has the strongest positive effect on PIB.	Supported	Supported

Table 9. Verification of the hypothesized causal structural model for each of the four services.						
		Hypothesis	Service A	Service B	Service C	Service D
H1-1		ATA and ITG each has a positive effect on FE.	Supported	Supported	Supported	Supported
	H1-1-1	ATA has a positive effect on FE	Supported	Supported	Supported	Supported
	H1-1-2	ITG has a positive effect on FE	Supported	Supported	Supported	Supported
H1-2		ITG has a stronger positive effect on FE than does ATA.	Not supported	Not supported	Supported	Not supported
H1-3		ATA has a positive effect on ITG.	Supported	Supported	Supported	Supported
H1-4		FE, ATA, and ITG each has a positive effect on CIA.	Not supported	Not supported	Not supported	Not supported
	H1-4-1	FE has a positive effect on CIA	Supported	Not supported	Supported	Supported
	H1-4-2	ATA has a positive effect on CIA	Supported	Supported	Supported	Supported
	H1-4-3	ITG has a positive effect on CIA	Not supported	Not supported	Not supported	Not supported
H1-5		FE has the strongest positive effect on CIA.	Not supported	Not supported	Not supported	Not supported

(Continued)

Table 9. (Continued)						
		Hypothesis	Service A	Service B	Service C	Service D
H1-6		FE, ATA, ITG, and CIA each has a positive effect on ATB.	Not supported	Not supported	Not supported	Not supported
	H1-6-1	FE has a positive effect on ATB	Supported	Not supported	Supported	Supported
	H1-6-2	ATA has a positive effect on ATB	Not supported	Supported	Supported	Supported
	H1-6-3	ITG has a positive effect on ATB	Supported	Not supported	Supported	Not supported
	H1-6-4	CIA has a positive effect on ATB	Supported	Not supported	Not supported	Supported
H1-7		FE has the strongest positive effect on ATB.	Not supported	Not supported	Not supported	Not supported
H1-8		CIA and ATB each has a positive effect on PIB.	Supported	Supported	Supported	Supported
	H1-8-4	CIA has a positive effect on PIB	Not supported	Not supported	Not supported	Not supported
	H1-8-5	ATB has a positive effect on PIB	Supported	Supported	Supported	Supported
H1-9		ATB has the strongest positive effect on PIB.	Supported	Supported	Supported	Supported

Table 10. Verification of the hypotheses on comparisons between categories, and differences between each factor within each category.		
	Hypothesis	
H2-1	The positive effects between each of the factors are stronger in the running support services than in the learning support services.	Not supported
	H2-1-1 The positive effect of ATA on FE is stronger in the running support services than in the learning support services	Not supported
	H2-1-2 The positive effect of ITG on FE is stronger in the running support services than in the learning support services	Not supported
	H2-1-3 The positive effect of ATA on ITG is stronger in the running support services than in the learning support services	Not supported
	H2-1-4 The positive effect of FE on CIA is stronger in the running support services than in the learning support services	Not supported
	H2-1-5 The positive effect of ATA on CIA is stronger in the running support services than in the learning support services	Supported
	H2-1-6 The positive effect of ITG on CIA is stronger in the running support services than in the learning support services	Not supported
	H2-1-7 The positive effect of FE on ATB is stronger in the running support services than in the learning support services	Not supported
	H2-1-8 The positive effect of ATA on ATB is stronger in the running support services than in the learning support services	Not supported

(Continued)

Table 10. (Continued)			
		Hypothesis	
	H2-1-9	The positive effect of ITG on ATB is stronger in the running support services than in the learning support services	Not supported
	H2-1-10	The positive effect of CIA on ATB is stronger in the running support services than in the learning support services	Not supported
	H2-1-11	The positive effect of CIA on PIB is stronger in the running support services than in the learning support services	Not supported
	H2-1-12	The positive effect of ATB on PIB is stronger in the running support services than in the learning support services	Supported
H2-2		The factor levels are higher in the running support services than in the learning support services.	Not supported
	H2-2-1	The levels of ATA is higher in the running support services than in the learning support services	Supported
	H2-2-2	The levels of ITG is higher in the running support services than in the learning support services	Not supported
	H2-2-3	The levels of FE is higher in the running support services than in the learning support services	Not supported
	H2-2-4	The levels of CIA is higher in the running support services than in the learning support services	Not supported
	H2-2-5	The levels of ATB is higher in the running support services than in the learning support services	Supported
	H2-2-6	The levels of PIB is higher in the running support services than in the learning support services	Supported

Table 11. Verification of the hypotheses on the comparison of services within the same category.			
	Hypothesis	Running support services	Learning support services
H2-3	The positive effects between each of the factors are stronger for the Japanese services than for the U.S. services.	Not supported	Not supported
	H2-3-1 The positive effect of ATA on FE is stronger for the Japanese services than for the U.S. services	Not supported	Not supported
	H2-3-2 The positive effect of ITG on FE is stronger for the Japanese services than for the U.S. services	Not supported	Not supported
	H2-3-3 The positive effect of ATA on ITG is stronger for the Japanese services than for the U.S. services	Not supported	Not supported
	H2-3-4 The positive effect of FE on CIA is stronger for the Japanese services than for the U.S. services	Not supported	Not supported
	H2-3-5 The positive effect of ATA on CIA is stronger for the Japanese services than for the U.S. services	Supported	Supported
	H2-3-6 The positive effect of ITG on CIA is stronger for the Japanese services than for the U.S. services	Not supported	Not supported
	H2-3-7 The positive effect of FE on ATB is stronger for the Japanese services than for the U.S. services	Not supported	Not supported
	H2-3-8 The positive effect of ATA on ATB is stronger for the Japanese services than for the U.S. services	Not supported	Not supported

(Continued)

Table 11. (Continued)					
		Hypothesis		Running support services	Learning support services
	H2-3-9	The positive effect of ITG on ATB is stronger for the Japanese services than for the U.S. services		Not supported	Not supported
	H2-3-10	The positive effect of CIA on ATB is stronger for the Japanese services than for the U.S. services		Not supported	Not supported
	H2-3-11	The positive effect of CIA on PIB is stronger for the Japanese services than for the U.S. services		Not supported	Not supported
	H2-3-12	The positive effect of ATB on PIB is stronger for the Japanese services than for the U.S. services		Not supported	Not supported
H2-4		The factor levels are higher for the Japanese services than for the U.S. services.		Not supported	Not supported
	H2-4-1	The level of ATA is higher for the Japanese services than for the U.S. services		Not supported	Not supported
	H2-4-2	The level of ITG is higher for the Japanese services than for the U.S. services		Supported	Supported
	H2-4-3	The level of FE is higher for the Japanese services than for the U.S. services		Not supported	Not supported
	H2-4-4	The level of CIA is higher for the Japanese services than for the U.S. services		Not supported	Not supported
	H2-4-5	The level of ATB is higher for the Japanese services than for the U.S. services		Not supported	Not supported
	H2-4-6	The level of PIB is higher for the Japanese services than for the U.S. services		Not supported	Not supported

the characteristics of the activity of running in particular bring about feelings of challenge and satisfaction in users' FEs, which show absorption, immersion, and concentration. In other words, it is considered that running itself contains elements of challenge—for example, those pertaining to time and distance parameters—and that users achieve a sense of satisfaction from these elements.

Furthermore, it is noteworthy that CIA had a negative effect on PIB in learning support services. There was no significant path in running support services, and this indicates that in this context, CIA does not relate directly to PIB. It also points to the difficulty inherent in conducting gamification-oriented marketing across all industry categories. It appears that the continuation of learning is ultimately and solely a continuation of the attitude and habit of learning, and is independent of brand preferences.

6.2 Comparison of services within the same category

First, the effects of ATA are not significant for Service A or Service D, and the effects of ITG are not significant for Service A with regard to FE “absorption.” When this is considered—in conjunction with the fact that ATA and ITG affect FE “absorption”—it appears that the effects of ATA and ITG are limited, particularly with respect to FE “absorption.” One interpretation is that U.S. services in Japan are of a certain type of brand and are positioned in the market as fashionable, and so the FE “absorption” is created by the gamification itself, rather than by the activity.

Next, two effects—namely, the effects of FE “challenge” on ATB, and the effects of FE “absorption” on CIA—were significant for learning support services and, even when each individual service was considered, they were significant for three services (Services A, C, and D). This might signify that, in gamification services, there are categories and services (e.g., learning support services) in which user absorption, concentration, and immersion increase the user's intent to continue the activity and affects his or her attitude toward the brand; to a certain extent, it could therefore be said that absorption, concentration, and immersion directly affect consumer psychology and consumption behavior. In other words, FE “challenge” connects to an improvement in feelings of self-affirmation; this improvement stems from the challenge that users set for themselves, while the FE “challenge” connects to CIA via the pleasure that comes from it.

Among all the services, the effects on CIA were strongest from ATA. A user's intention to continue an activity can be said to be created from that person's ATA itself, and the products assist as an exclusive function of the activity. Ultimately, gamification appears to be positioned as a component of assistance and support, and the main element is the activity itself. It is also the case that the main factors affecting ATB differed for each service. When results are considered by category, each of ATA, ITG, FE, and CIA was found to have a

significant effect on ATB; however, when the results for each of the services are considered, there are factors that do not necessarily have a positive effect, and not all of the factors exert a positive effect on ATB. For example, the effects of ATA are significant for Service B, but not for Service A, and they are more pronounced for Service D than for Service C. In addition, the effects of ITG are significant for Service A and Service C, but not for Service B or Service D. One interpretation is that there are differences in brand image and user groups between Service A and Service B. Specifically, it was considered that, compared to the Japanese Service B, the U.S. Service A is a popular brand, including among light-running users. In contrast, Service B users are more athletically oriented, and the aforementioned differences occur for this reason. It is also thought that one difference between Service C and Service D is that the former has many users who use it to study for qualifications or exams, and so they will see the results of their study within a comparatively short period, while the latter is used for learning English, and its users need to take a medium to long-term approach.

Among all the services, ATB has a strongly significant effect on PIB. This indicates that favorable feelings toward a brand connect well with PIB. When we consider the significantly positive effect that CIA has on ATB across all the services, it appears that the use of gamification has the effect of connecting the intention to continue a difficult activity and purchasing activity, through the user's favorable feelings toward a brand.

In this way, the results of the current study show that, for any given service, favorable feelings toward a brand that uses gamification are, in practical terms, increased through a number of different factors.

7 Conclusion: summary, and future research topics

The objective of this research was to investigate differences in user-psychology mechanisms between categories and services that use gamification in their marketing. To this end, we conducted a survey of the users of four services—namely, two running support services and two learning support services—as representative of services that use gamification. We carried out analyses and comparisons between the two categories and among the four services, and our three main findings can be summarized as follows.

1) The effects of an FE on the intention to continue the activity, and favorable feelings toward the brand that uses gamification, differ by service. 2) Favorable feelings toward the brand differ by service, and are enhanced through a number of factors. 3) It is thought that this is the result of different levels of positive ATA between categories, and differences in effects among the factors.

Among the issues to be addressed in future research—as prompted by the findings of the current study—are the effects that various factors have on the psychology of users of gamification services, in order to clarify the reasons

behind differences in causal relationships among services that use gamification. Not all of the differences in causal relationships in gamification can be explained by differences in ITG; therefore, a survey and subsequent analysis are needed to consider factors such as user attributes, conditions, and the status of the brand image of the company that is managing the service.

It is likely that gamification will continue to be used in marketing, and to a growing extent; therefore, further research into gamification, consumer psychology, and consumer behavior will be essential. At present, this research area is still nascent, but it holds much promise.

Note 1) The number of respondents for Service A and Service B differed greatly, because of differences in the number of users of each service, and data acquisition difficulties. Therefore, we carried out random sampling, and the numbers of respondents for the analysis were made equal across all four services; in so doing, we eliminated the influence of user numbers on the analytical results.

Note 2 and 3) In all of the simultaneous analysis models, the Akaike information criterion (AIC) from the model was relatively low, when the equality constraint was implemented on the factor loadings of the three latent variables of ATA, FE “challenge,” and FE “absorption.” The investigation was carried out based on various indicators, including goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA) (Hair et al. 2010). Figure 2 shows that both the GFI and the AGFI are below .900, and this condition is considered to show sufficient goodness of fit; Figure 3 shows the same for GFI, AGFI, and CFI. However, according to Toyoda (2002), when the GFI is the issue—particularly in the event that multiple populations are not analyzed—if we refer to the indicator of goodness of fit per single degree of freedom, such as for RMSEA, the objective standard can be satisfied, even when the GFI falls below this level. Even in previous studies that used SEM, it was assumed that if there were observation variables being used for scientific reasons, and a model that conforms to the research objectives, then analysis could proceed, even when the GFI and AGFI values are low. In the current study, it was necessary when confirming the hypotheses to carry out multiple population simultaneous analysis while using the same model used to analyze the entire survey population. The CFI exceeded .900, and the RMSEA was .046 in Figure 2 and .037 in Figure 3; these values are all within a tolerable range. Therefore, it was thought that analysis could be executed by using the model in which the equality constraint was imposed on the factor loadings of the three latent variables.

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Appendix A

Structural equation modeling: Investigation of the equality constraint in the simultaneous analytical model of running support services and learning support services

Running support services and learning support services									
Equality constraints	CMIN	DF	CMIN/DF	GFI	AGFI	CFI	RMSEA	AIC	BCC
(Nothing)	1186.129	316	3.754	.915	.876	.958	.047	1478.129	1488.926
I, II, III, IV, V	1253.752	348	3.603	.911	.881	.956	.046	1481.752	1490.183
I	1186.827	317	3.744	.915	.876	.958	.047	1476.827	1487.549
II	1196.410	324	3.693	.914	.878	.957	.047	1472.410	1482.615
III	1221.355	327	3.735	.913	.877	.956	.047	1491.355	1501.338
IV	1202.430	327	3.677	.914	.879	.957	.047	1472.430	1482.413
V	1191.865	317	3.760	.915	.876	.957	.047	1481.865	1492.588
I, II	1197.071	325	3.683	.914	.878	.957	.047	1471.071	1481.202
I, III	1222.069	328	3.726	.913	.877	.956	.047	1490.069	1499.978
I, IV	1203.128	328	3.668	.914	.879	.957	.046	1471.128	1481.038
I, V	1192.575	318	3.750	.915	.876	.957	.047	1480.575	1491.224
II, III	1231.629	335	3.677	.912	.878	.956	.047	1485.629	1495.021
II, IV	1212.486	335	3.619	.914	.881	.957	.046	1466.486	1475.878
II, V	1202.120	325	3.699	.914	.878	.957	.047	1476.120	1486.251
III, IV	1237.376	338	3.661	.912	.879	.956	.046	1485.376	1494.545
III, V	1227.008	328	3.741	.912	.876	.956	.047	1495.008	1504.917
IV, V	1208.157	328	3.683	.914	.879	.957	.047	1476.157	1486.066
I, II, III	1232.308	336	3.668	.912	.879	.956	.046	1484.308	1493.625
I, II, IV	1213.149	336	3.611	.914	.881	.957	.046	1465.149	1474.467
I, II, V	1202.794	326	3.690	.914	.878	.957	.047	1474.794	1484.851
I, III, IV	1238.090	339	3.652	.912	.880	.956	.046	1484.090	1493.186

(Continued)

Running support services and learning support services. (Continued)

Equality constraints	CMIN	DF	CMIN/DF	GFI	AGFI	CFI	RMSEA	AIC	BCC
I, III, V	1227.736	329	3.732	.912	.877	.956	.047	1493.736	1503.571
I, IV, V	1208.869	329	3.674	.914	.879	.957	.047	1474.869	1484.704
II, III, IV	1247.437	346	3.605	.911	.881	.956	.046	1479.437	1488.015
II, III, V	1237.258	336	3.682	.911	.878	.956	.047	1489.258	1498.576
II, IV, V	1218.188	336	3.626	.913	.881	.957	.046	1470.188	1479.506
III, IV, V	1243.023	339	3.667	.911	.879	.956	.046	1489.023	1498.119
I, II, III, IV	1248.116	347	3.597	.911	.882	.956	.046	1478.116	1486.620
I, II, III, V	1245.410	344	3.620	.911	.881	.956	.046	1481.410	1490.136
I, II, IV, V	1218.865	337	3.617	.913	.881	.957	.046	1468.865	1478.108
I, III, IV, V	1243.751	340	3.658	.911	.880	.956	.046	1487.751	1496.773
"I: ATA (attitude toward the activity) " "II: FE (flow experience) "challenge" " "III: ITG (impression of the game elements and mechanisms) "competition and self-expression" " "IV: FE (flow experience) "absorption" " "V: ATB (attitude toward the brand) "									

Appendix B

Structural equation modeling: Investigation of the equality constraint in the simultaneous analytical model of the four services

Services A, B, C, D									
Equality constraints	CMIN	DF	CMIN/DF	GFI	AGFI	CFI	RMSEA	AIC	BCC
(Nothing)	1785.837	632	2.826	.882	.828	.945	.038	2369.84	2414.760
I, II, III, IV, V	1953.010	728	2.683	.872	.837	.941	.037	2345.010	2375.16
I	1787.176	635	2.814	.882	.828	.945	.038	2365.18	2409.64
II	1812.520	656	2.763	.880	.831	.945	.038	2348.520	2389.75
III	1866.963	665	2.807	.876	.828	.942	.038	2384.96	2424.810
IV	1831.174	665	2.754	.880	.834	.944	.038	2349.17	2389.020
V	1798.128	635	2.832	.881	.827	.944	.039	2376.13	2420.590
I, II	1813.842	659	2.752	.880	.832	.945	.038	2343.84	2384.61
I, III	1868.297	668	2.797	.876	.829	.943	.038	2380.3	2419.68
I, IV	1832.527	668	2.743	.880	.834	.944	.038	2344.53	2383.91
I, V	1799.468	638	2.820	.881	.828	.944	.038	2371.47	2415.47
II, III	1893.718	689	2.749	.874	.832	.942	.038	2363.72	2399.87
II, IV	1857.871	689	2.696	.878	.837	.944	.037	2327.87	2364.03
II, V	1824.771	659	2.769	.879	.831	.944	.038	2354.77	2395.540
III, IV	1912.705	698	2.740	.874	.834	.942	.038	2364.71	2399.47
III, V	1879.159	668	2.813	.876	.828	.942	.038	2391.16	2430.54
IV, V	1843.468	668	2.760	.879	.833	.944	.038	2355.47	2394.85
I, II, III	1929.220	713	2.706	.873	.836	.942	.037	2351.220	2383.68
I, II, IV	1859.210	692	2.687	.878	.838	.944	.037	2323.210	2358.9
I, II, V	1826.094	662	2.758	.879	.832	.944	.038	2350.09	2390.4
I, III, IV	1914.064	701	2.730	.874	.835	.942	.037	2360.06	2394.37
I, III, V	1880.494	671	2.803	.876	.829	.942	.038	2386.49	2425.42

(Continued)

Services A, B, C, D. (Continued)									
Equality constraints	CMIN	DF	CMIN/DF	GFI	AGFI	CFI	RMSEA	AIC	BCC
I, IV, V	1844.822	671	2.749	.879	.834	.944	.038	2350.82	2389.75
II, III, IV	1939.512	722	2.686	.872	.837	.942	.037	2343.51	2374.59
II, III, V	1905.872	692	2.754	.874	.831	.942	.038	2369.87	2405.56
II, IV, V	1870.121	692	2.702	.878	.836	.944	.037	2334.12	2369.81
III, IV, V	1924.901	701	2.746	.874	.834	.941	.038	2370.9	2405.21
I, II, III, IV	1940.859	725	2.677	.872	.837	.942	.037	2338.86	2369.47
I, II, III, V	1907.191	695	2.744	.874	.832	.942	.038	2365.19	2400.42
I, II, IV, V	1871.461	695	2.693	.878	.837	.944	.037	2329.46	2364.69
I, III, IV, V	1926.262	704	2.736	.874	.834	.942	.038	2366.26	2400.11
"I: ATA (attitude toward the activity)" "II: FE (flow experience) "challenge" " "III: ITG (impression of the game elements and mechanisms) "competition and self-expression" " "IV: FE (flow experience) "absorption" " "V: ATB (attitude toward the brand)"									