

AMBIVALENCE TOWARD PERSONALIZED TECHNOLOGY AND INTENTION TO USE LOCATION-BASED MOBILE COMMERCE: THE MODERATING ROLE OF GENDER

Jin-Myong Lee
Chungnam National University
99 Daehak-ro, Gung-dong, Yuseong-gu, Daejeon, Korea
jmlee@cnu.ac.kr

Jong-Youn Rha
Seoul National University
1 Gwanak-ro, Gwanak-gu, Seoul, Korea
jrha@snu.ac.kr

ABSTRACT

The personalized benefits consumers gain from technology often simultaneously increase their privacy risk, and thus their evaluation of such personalized technologies (PTs) could be ambivalent. This study aimed to examine the effects of ambivalence toward PTs on internal conflicts and intention to use location-based mobile commerce (LBMC) and the extent to which these relationships are moderated by gender. Data were collected from a self-administered online survey of South Korean mobile users (N = 500). The structural equation results revealed that ambivalence toward PTs had a direct positive effect on intention to use LBMC and an indirect negative effect mediated by internal conflict. Gender was found to moderate two paths in the model; a high level of ambivalence toward PTs increased the internal conflicts among females but not males, whereas internal conflicts decreased the intention to use LBMC among males but not females. Theoretical and managerial implications for researchers and marketing practitioners are then discussed.

Keywords: Ambivalence, Personalized Technology, Mobile Commerce Internal Conflict, Gender Difference

1. INTRODUCTION

Studies on the human-technology relation in consumer research highlight consumers' ambivalent attitudes towards technology.^{1,2} Consumers tend to experience tension between both love and hatred toward the technology in their lives and thus face an ongoing ambivalent state in their relationships with technological objects.³

Personalized technologies (PTs) in mobile commerce present a representative case that can engender an ambivalent response from consumers.⁴ The development of advanced information technology has facilitated the collection and integration of multiple data, such as the current location, weblogs, and SNS data, all acquired by mobile devices that can extract a more accurate and specific consumer profile.⁵ Thus, if consumers wish to utilize PTs fully, they may face high privacy risk. Due to these characteristics, as PTs undergo development and personalized services expand, both the benefits and risks of PTs have become more apparent, thereby consumers may face a dilemma between seeking personalized benefits and avoiding privacy risks, also known as the personalization-privacy paradox.⁶ Despite the growing empirical interest in the ambivalent properties of PTs, most research on the personalization-privacy paradox has examined the effects of personalized benefits and privacy risks only separately.^{7,8,9} Meanwhile, the effects of ambivalence toward such PTs and individual differences in reaction when in ambivalent state have seldom been investigated.

This study aimed to examine the effects of consumers' ambivalence toward PTs on their internal conflict and intention to use location-based mobile commerce (LBMC) in cases in which technological ambivalence is more prevalent. As such, this study expands the discussion from previous research regarding the personalization-privacy paradox by trying to reveal the structural relationships among ambivalent evaluation (cognition), psychological conflict (affect), and use intention (behavior). Gender has been studied as a major factor that shows significant differences in the process of dealing with ambivalent information¹⁰ as well as in the recognition of new technologies.¹¹ Accordingly, the second objective of this study is to analyze the moderating effect of gender on the relationship between variables, as this could play an important role in better understanding consumer ambivalence in general.

2. THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

2.1 Ambivalence and Its Effects

In the field of information systems, research defines ambivalence as a state of an individual's experience of conflicting cognitions, emotions, and attitudes toward a system and its use.¹² In contrast to the traditional idea that attitudes are either positive or negative, there is now extensive evidence that separate positive and negative evaluations can exist simultaneously.¹³ Cacioppo and Berntson¹⁴ conceptualized ambivalence as the concurrent activation of both positive and negative evaluations and postulated such in the evaluative space model (ESM) (Figure 1). They argued that, based on the combinations of high and low levels of positive and negative responses, evaluation could be a "bipolar conceptualization as the reciprocal diagonal" or even "states of ambivalence associated with coactivity diagonal," in that attitudes can be understood as multi-dimensional.¹⁵ This definition allows for a distinction between the neutral state as a midway between evaluations of opposite valence and the ambivalent state as evaluations of simultaneously high opposite valence.¹⁶

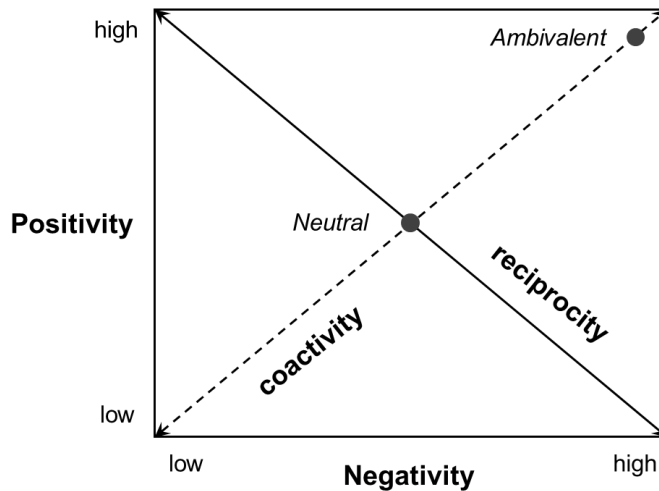


Figure 1. The bivariate evaluative space¹⁴

Different conceptual approaches have led to the classification of ambivalence into two types: objective ambivalence as the associative structure of ambivalence based on positive and negative association weights, and subjective ambivalence as the experience of conflict due to this associative structure.¹³ Studies applying the objective ambivalence approach generally focus on how human beings respond to ambivalent

attributes that are connoted by objectives, with most studies using formula-based measures of ambivalence.^{17,18} Subjective ambivalence focuses on individuals' emotions that occur from internal contradictions and is measured with self-reporting scales that assess how confused or conflicted an individual is about a certain object/situation.¹⁹⁻²¹

Some studies attempted to analyze the relationships between the two different concepts, based on the belief that the evaluated level of ambivalence and the actual conflict experienced have different properties. Simply put, when the level of objective ambivalence is high, subjective ambivalence could increase, but this is not the only relationship between the two.^{21,22} Empirical studies revealed that the two concepts have positive correlations,^{23,24} and subjective ambivalence mediates the effects of objective ambivalence on consumers' satisfaction or behavioral intention.²⁵

This study also took into consideration the need to distinguish between objective and subjective ambivalence, because these aspects differ in terms of the subjects of evaluation. Thus, this study adopted a comprehensive definition of ambivalence—the former is referred to as “ambivalence” and the latter as “internal conflict”—and assumes that consumers' internal conflicts increase as the paradoxical relationship of personalized benefits and privacy risks is highly perceived. Formally, the following is hypothesized:

H1: Consumers' ambivalence toward PTs has a positive effect on their internal conflict.

In the existing literature, ambivalence has been regarded as both a positive and a negative factor.^{13,26} Studies suggest a negative effect of ambivalence on consumer behaviour, focusing on contradiction and conflicts connoted in research objects.^{17,24,27}

As the concept of ambivalence expanded to explain the tendency of a variety of human evaluations, researchers began postulating that ambivalence can have positive results, too. The studies that highlight the positive effects of ambivalence focus on the independent coexistence of beliefs and values. In addition, satisfaction or behavioral change is considered to be the final consequence of ambivalence, and psychological conflict is regarded as part of the process to reach consequences from the ambivalent state.¹⁸ Tetlock²⁸ suggested that ambivalence fosters more complex thinking about an object and helps users make qualitatively superior decisions from more multilateral perspectives. Jonas, Broemer, and Diehl²⁹ asserted that, as ambivalence increases, consumers become more thorough and active in their search for information, and this is

connected to positive behavioral decisions.

Some studies dealing with ambivalence about technology also suggest that ambivalence can have positive effects on consumer behaviors.^{6,30,31} Ploderer et al.,³¹ for example, examined consumer ambivalence toward the technology of tracking and sharing personal information and found that ambivalent consumers can deal very well with complex objects, which can reinforce their behaviors. They treat ambivalence not as an obstacle to overcome but as a concept to recognize necessarily and reflect on during the development of technology. Lee and Rha⁶ also found that ambivalent consumer groups, who perceived LMBC to be both beneficial and risky, had a high level of continued use intention. Based on the above discussion, this study assumes that, when both positive and negative attributes of PTs are highly evaluated, consumer interest peaks, their views broaden, and their intention to use LBMC increases. Thus, the following hypothesis is proposed:

H2: Consumers' ambivalence toward PTs has a positive effect on their intention to use LBMC.

In general, internal conflicts are reported as having a negative impact on consumer behaviour.^{20,21} Olsen et al.²⁰ explained that subjective ambivalence, which measures the level of internal conflict, is negatively related to consumer satisfaction. Otnes, Lowrey, and Shrum³² argued that, when consumers experience conflict, the complexity of their decision making increases, and their intention to act decreases. As such, the following hypothesis is proposed:

H3: Consumers' internal conflict has a negative effect on their intention to use LBMC.

2.2 The Moderating Role of Gender

Gender is usually used as a key moderator in consumer behavior studies^{33,34} and studies on technology usage.^{10,35-37} Gefen and Straub³⁵ empirically proved that gender differences appear regarding beliefs around the use of computer-based media and suggested that a model explaining gender effects in research on IT use and diffusion is needed. Wang et al.³⁷ found that gender moderates the effect of social influence on consumers' intention to adopt mobile learning. Furthermore, Venkatesh et al.³⁶ concluded that gender moderates the effects of social influence, facilitating conditions, performance effort expectancy, and price on behavioral intention to use IT. The findings of these studies imply that the differential effects of gender should be considered when analyzing consumer responses to technology.

It is also suggested that gender is an important moderator for information processing in the communication field. According to selectivity theory, females are comprehensive information processors who consider and integrate all available details and are inclined to engage in active elaboration. In contrast, males are selective information processors who rely on fewer data points and tend to exercise schema-based, heuristic processing.³⁸ These predictions were tested and supported in many previous studies.³⁸⁻⁴¹ Moreover, Nenkov et al.¹¹ argued that males and females are different in both their communication styles and their approach-avoidance orientation toward negative stimuli.

Such studies show that the process to deal with the evaluation of objects including positive and negative attributes can differ by gender. Thus, we proposed the following hypotheses and examined the moderating effects of gender on the relationship between variables on an exploratory basis.

H4a: Gender moderates the relationship between ambivalence toward PTs and internal conflict.

H4b: Gender moderates the relationship between ambivalence toward PTs and intention to use LBMC.

H4c: Gender moderates the relationship between internal conflict and intention to use LBMC.

Finally, the research model and hypotheses are shown in Figure 2. The model considers ambivalence toward PTs as an independent variable, internal conflict as a mediating variable, and intention to use LBMC as a dependent variable. Research hypotheses focus on the interrelationships among constructs and propose the moderating effects of gender.

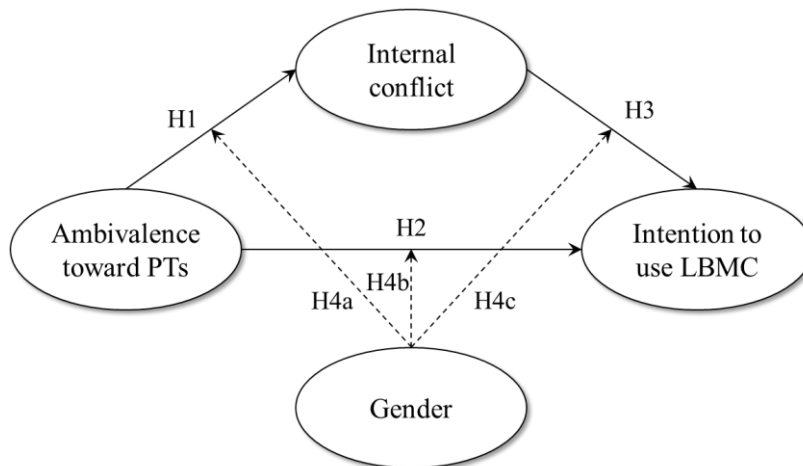


Figure 2. Research model

3. METHOD

3.1 Measurements

The measurement scales applied were developed based on a review of previous studies consistent with the definitions of the constructs used here. All items were measured on a six-point scale, ranging from “strongly disagree” (1) to “strongly agree” (6).

Following Kaplan,⁴² ambivalence toward PTs was assessed according to the measurement of objective ambivalence by separately ranking the positive and negative evaluations of PTs as personalized benefits, privacy risks, and calculated ambivalent scores. Personalized benefits were measured by seven items adapted from Xu et al.⁹'s work on mobile location-based coupon service, along with the convenience, efficiency, and entertainment that can be acquired through PTs. Privacy risks were composed of six items to measure privacy invasion and insecurity based on the research of Chellappa and Sin,⁴³ who measured online information privacy risks. Among the various existing indices in the recent research (for a comparative review, see Breckler⁴⁴), the most often used Griffin formulation was applied to calculate ambivalence. Accordingly, first, the means of the separate scores of the positive (P) and negative (N) evaluations were calculated, and then the absolute difference between the two components was subtracted (i.e., $(P + N)/2 - |P - N|$). This formula produces a score that is a function of the simultaneous intensity of the positive and negative ratings.⁴⁵

Internal conflict was measured according to four items adapted from the study of subjective ambivalence created by Priester and Petty²¹ by directly asking participants to report the degree to which they felt conflict, confusion, concern, or difficulty when weighing personalization and privacy.

Intention to use LBMC was assessed according to three items adapted from Mäntymäki and Salo⁴⁶ to measure continued use intention, purchase intention, and recommend intention. The study also collected demographic characteristics of the participants, including gender. The individual items used in the questionnaire are provided in the Appendix.

3.2 Sample and Data Collection

The study sample was composed of South Korean consumers aged 20 to 39 years who had used LBMC within the last three months. Data collection was conducted in two steps: a pilot survey and a main survey. A pilot test of the survey instrument was conducted with 42 university

students in order to establish its reliability, to clarify the wording as much as possible, and to rectify any existing problems prior to data collection. Following careful consideration of respondent feedback, scale reliability was tested, and the sentences were amended to ensure that their meaning was clear. The main survey was conducted using a self-administered online questionnaire from April 10 to 14, 2015. Participant recruitment and data collection were conducted by a professional research company called Embrain (www.embrain.com). To test for differences by gender, quota sampling was performed for males and females. A total of 517 sets were collected, and after excluding insincere responses, 500 were used for the analysis in the current study. Table 1 shows the general characteristics of the sample.

Table 1. Demographics of the respondents ($n=500$)

| Variables | Classification | N | % |
|----------------------------------|----------------------|-----|------|
| Gender | Male | 246 | 49.2 |
| | Female | 254 | 50.8 |
| Age (Mean=29.38) | 20-29 | 254 | 50.8 |
| | 30-39 | 246 | 49.2 |
| Monthly income (Mean=1,720\$) | < 1,500\$ | 165 | 33.0 |
| | 1,500-2,500\$ | 171 | 34.2 |
| | > 2,500\$ | 164 | 32.8 |
| Education level | High school or below | 34 | 6.8 |
| | University student | 99 | 19.8 |
| | Graduate | 367 | 73.4 |
| Occupation | Employee | 234 | 46.8 |
| | Self-employed | 105 | 21.0 |
| | Student | 108 | 21.6 |
| | Other | 53 | 10.6 |
| Marriage | Single | 337 | 67.4 |
| | Married | 163 | 32.6 |

3.3 Data Analysis

The PASW 20.0 software was used for descriptive statistics, correlation analysis, and reliability test. For hypothesis testing, the study employed a structural equation model (SEM), including measurement model, structural model, and multiple group analysis using Amos 20.0. Fit

indices were used to determine if the hypothesized model fit well with the sample data; chi-square, comparative fit index (CFI; fit if $\geq 0.90^{47}$), Tucker-Lewis index (TLI; fit if $\geq 0.90^{47}$), root mean square residual (RMR; fit if $\leq 0.50^{48}$), and root mean square error of approximation (RMSEA; fit if $\leq 0.80^{48}$).

4. RESULTS

4.1 Descriptive Analysis

The means, standard deviations, and correlations for the variables are presented in Tables 2 and 3. The mean score of personalized benefits as a positive response for PTs was 4.23 ($SD = 0.75$) and privacy risks as a negative response was 4.59 ($SD = 0.88$). The average for consumer ambivalence calculated by applying the Griffin formula was 3.56 ($SD = 0.99$). Variables were measured on a six-point scale, with the scope of ambivalence being arithmetically possible between -1.5 and 6. The corresponding figure for these data defined 0.08 as the minimum value and 5.79 as the maximum value. This indicates that consumers are somewhat ambivalent and not extreme in their views of PTs. There was significant correlation between variables, and the mean scores of the variables did not show a significant difference across gender.

Table 2. Descriptive statistics

| Construct | Mean (<i>SD</i>) | Gender | | |
|----------------------------|--------------------|--------|--------|-----------------|
| | | Male | Female | <i>t</i> -value |
| (1) Ambivalence toward PTs | 3.56 (0.99) | 3.50 | 3.62 | -1.31 |
| (2) Internal conflict | 3.85 (1.04) | 3.79 | 3.92 | -1.38 |
| (3) Intention to use LBMC | 3.70 (0.84) | 3.71 | 3.69 | 0.41 |

Note: *SD* = Standard Deviation

Table 3. Correlation matrix

| Construct | (1) | (2) | (3) |
|----------------------------|---------|---------|------|
| (1) Ambivalence toward PTs | 1.00 | | |
| (2) Internal conflict | 0.23*** | 1.00 | |
| (3) Intention to use LBMC | 0.38*** | -0.15** | 1.00 |

Note: ** $p < 0.01$, *** $p < 0.001$

4.2 Evaluating the Measurement Model

The internal consistency of each construct incorporated in the model was tested using Cronbach's alpha. The values are 0.87 and 0.94, indicating that the constructs employed in the model are reliable⁴⁸. To test the validity of the scales, confirmatory factor analysis (CFA) was performed. The measurement model shows strong fitness between the data and the model ($\chi^2 = 63.80$, $df = 19$, $p < 0.001$). Several common indices (CFI = 0.98, TLI = 0.97, RMR = 0.03, RMSEA = 0.06) were examined, and the results suggested an adequate goodness fit.^{47,48} Convergent validity was evaluated with three criteria (Table 4): (i) all standardized factor loadings for an item were statistically significant and greater than 0.60; (ii) all composite reliability (CR) values were greater than 0.70; and (iii) all average variance extracted (AVE) values were greater than 0.50.⁴⁸ Assessment of discriminant validity, using the approach by Fornell and Larcker,⁴⁹ demonstrated that the AVE for both constructs was greater than the squared correlation (-0.29), providing evidence of discriminant validity. Ambivalence toward PTs was calculated as a single value by the Griffin formula, thus reliability and convergent validity were not evaluated.

Table 4. Measurement model results

| Construct | Indicator | Item Loading | CR | AVE | Cronbach's α |
|-----------------------|-----------|--------------|------|------|---------------------|
| Internal conflict | IC1 | 0.89 | 0.93 | 0.78 | 0.94 |
| | IC2 | 0.89 | | | |
| | IC3 | 0.89 | | | |
| | IC4 | 0.87 | | | |
| Intention to use LBMC | UI1 | 0.83 | 0.87 | 0.62 | 0.87 |
| | UI2 | 0.81 | | | |
| | UI3 | 0.83 | | | |

Note: All factor loadings are significant at $p < 0.001$

Fit statistics: $\chi^2 = 63.80$, $df = 19$, CFI = 0.98, TLI = 0.97, RMR = 0.03, RMSEA = 0.06

4.3 Evaluating the Structural Model

The research model was assessed using SEM, the results showed that the χ^2 value was significant, and the fit indices supported a good model fit ($\chi^2 = 71.34$, $df = 25$, $p < 0.001$; CFI = 0.98, TLI = 0.97, RMR = 0.03, RMSEA = 0.06). As shown in Table 5, path analysis revealed that all structural hypotheses were supported. More specifically, significant positive relationships were observed between ambivalence toward PTs

and internal conflict (confirming H1) and ambivalence toward PTs and intention to use LBMC (confirming H2). Significant negative relationships were observed between internal conflict and intention to use LBMC (confirming H3).

Table 5. Structural equation models assessment

| Paths | β | t | Result |
|---|----------|-------|-----------|
| H1: Ambivalence toward PTs → Internal conflict | 0.25*** | 5.45 | Supported |
| H2: Ambivalence toward PTs → Intention to use LBMC | 0.45*** | 9.49 | Supported |
| H3: Internal conflict → Intention to use LBMC | -0.17*** | -3.69 | Supported |

Note: Fit statistics: $\chi^2 = 71.34$, $df = 25$, CFI = 0.98, TLI = 0.97, RMR = 0.03, RMSEA = 0.06

*** $p < 0.001$

To examine whether the relationship between ambivalence toward PTs and intention to use LBMC was mediated by internal conflict, a bootstrapping confidence interval procedure was conducted.⁴⁹ As presented in Table 6, the direct effect and indirect effect through the intervening variable of internal conflict were statistically significant. Furthermore, the results of a Sobel test⁵⁰ confirmed the partially mediating effect of internal conflict ($Z = -3.46$, $p < 0.001$).

In short, ambivalence toward PTs has a direct positive effect on intention to use LBMC and an indirect negative effect that is mediated by internal conflict.

Table 6. Mediation test

| Path | Standardize d direct effect | Standardize d indirect effect | Total effect |
|--|-----------------------------------|-------------------------------------|-----------------|
| Ambivalence toward PTs → Internal conflict → Intention to use LBMC | 0.45** | -0.04** | 0.41* |

Note: bootstrapping bias-corrected confidence intervals

* $p < 0.05$, ** $p < 0.01$

4.4 Testing the Moderating Effects of Gender

To examine the moderating effects of gender in the adopted SEM

model, a multi-group analysis approach comparing the males and females was applied. The data were fit to the model described in the previous section. Other indices were within the acceptance ranges ($\chi^2 = 105.65$, $p < 0.001$, $df = 58$; CFI = 0.98, TLI = 0.97, RMSEA = 0.04).

To test the invariance of model parameters across the two gender groups, nested comparisons of constrained models were initiated. Table 7 presents the results of model comparisons by chi-square differences. A comparison between Model 2 and Model 1 showed a non-significant chi-square difference ($p = 0.82$), supporting the invariance of these parameters across males and females. Then, Model 3, in which all of the structural weights were constrained, was compared to Model 2. The addition of constraints on structural paths did lead to a significant chi-square difference ($p = 0.01$), suggesting that at least one of the structural weights varied across gender. Individual path analysis found the effect of ambivalence toward PTs on internal conflict (comparison of Model 2 and Model 4a, $p < 0.001$) and that of internal conflict on the intention to use LBMC (comparison of Model 2 and Model 4c, $p = 0.01$) to be significantly different for the two groups; the effect of ambivalence toward PTs on intention to use LBMC (comparison of Model 2 and Model 4b, $p = 0.06$) was deemed not significant, albeit narrowly. Thus, H4a and H4c, which proposed the moderating role of gender, were supported.

Table 7. Invariance tests

| Model | χ^2 | df | $\Delta\chi^2$ | Δdf | p | Compared to |
|--|----------|------|----------------|-------------|---------|-------------|
| Model 1. Unconstrained | 105.65 | 50 | | | | |
| Model 2. Measurement weights | 108.54 | 56 | 2.88 | 6 | 0.82 | Model 1 |
| Model 3. Structural weights | 136.88 | 67 | 28.33 | 11 | 0.01 | Model 2 |
| Model 4a: Ambivalence toward PTs → Internal conflict | 121.19 | 57 | 12.65 | 1 | < 0.001 | Model 2 |
| Model 4b: Ambivalence toward PTs → Intention to use LBMC | 111.64 | 57 | 3.10 | 1 | 0.06 | Model 2 |
| Model 4c: Internal conflict → Intention to use LBMC | 114.18 | 57 | 5.64 | 1 | 0.01 | Model 2 |

Examination of the unconstrained regression weights (Table 8)

revealed that ambivalence toward PTs had a significant effect on the internal conflicts among females ($\beta = 0.41$, $p < 0.001$) but not males ($\beta = 0.08$, $p = 0.21$), and internal conflicts had a significant effect on intention to use LBMC among males ($\beta = -0.29$, $p < 0.001$) but not females ($\beta = -0.05$, $p = 0.49$). The critical ratios for parameter differences confirmed that the two paths of the model significantly differ across gender. These effects are depicted as solid lines in Figure 3.

Table 8. Comparison of structural relationships across gender

| | Male | | Female | | C.R. | Result |
|---|----------|-------|---------|-------|---------|---------------|
| | β | t | β | t | | |
| H4a: Ambivalence toward PTs → Internal conflict | 0.08 | 1.26 | 0.41*** | 6.76 | 3.47*** | Supported |
| H4b: Ambivalence toward PTs → Intention to use LBMC | 0.52*** | 8.24 | 0.32*** | 4.43 | 1.91 | Not supported |
| H4c: Internal conflict → Intention to use LBMC | -0.29*** | -3.99 | -0.05 | -0.68 | -2.16* | Supported |

Note: C.R. = critical ratios for differences between parameters

* $p < 0.05$, *** $p < 0.001$

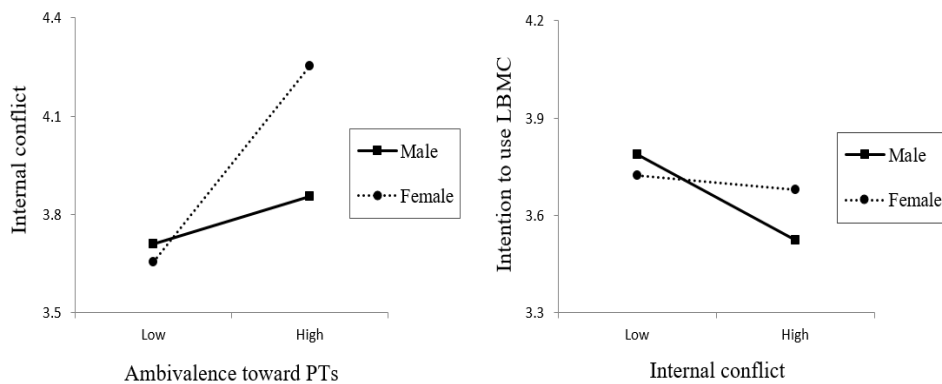


Figure 3. Moderating effects of gender

5. DISCUSSION AND IMPLICATIONS

By approaching consumer responses to the personalization-privacy paradox as a function of ambivalence, this study investigated the effects of consumer ambivalence toward PTs (cognition) on internal conflict (affect)

and intention to use LBMC (behavior), along with the moderating role of gender.

The key empirical finding revealed that consumers' ambivalence toward PTs has a positive, direct effect on their intention to use LBMC. This result is consistent with the claim by Tetlock²⁸ that high ambivalence implies a state of consideration of the multifaceted aspects of objects. Previous studies explain that privacy risk is a factor that reduces consumers' use of services when measured independently. However, the finding of this study shows that strong and integrated evaluation embracing the pros and cons of PTs could ultimately lead to the adoption and use of personalized services, highlighting the importance of a holistic approach regarding consumers' response to technology. Consumers' ambivalence toward PTs also has a negative, indirect effect on their intention to use LBMC through the mediating role of internal conflict. This finding suggests that reducing consumers' internal conflicts should be an important managerial goal.

Another major implication of this finding is that the concept of objective ambivalence as a coexisting state of competing responses and subjective ambivalence as an internal conflict should be distinguished. The two concepts have been used in a somewhat mixed way in previous literature¹³, which has made it difficult to identify the effects of ambivalence on consumer satisfaction and decision-making outcomes.

Furthermore, this study found new evidence that the effects of ambivalence and internal conflict can be moderated by gender. The positive effect of ambivalence toward PTs on internal conflict was significant among females but not males. This is consistent with the findings of the existing literature that females try to elaborate on information in comprehensive viewpoints but males heuristically deal with information based on lesser data.^{38,41} Noting that females comprehensively consider their goals when balancing personalized benefits and privacy risks, they may experience conflicts due to the paradoxical relationship between the two goals. On the other hand, internal conflict is not engendered among males, as they selectively rely on broader goals.

Interestingly, the negative effect of internal conflict on intention to use LBMC was significant among males but not females. In general, females are believed to handle conflict and stress better than males, and they resolve conflict by actively coping with those situations.⁵¹ The result of this study implies that, even though females experience conflict, they resolve it better in their internal systems, and therefore any negative influence on behavior can be alleviated. On the other hand, if males suffer

internal conflicts, such conflicts have a more critical influence on their behavior.

This study has managerial implications for marketing practitioners. The findings show that ambivalent evaluations of personalized benefits and privacy risks can have a positive effect on consumer adoption and use of LBMC. This implies that LBMC and marketing practitioners that use personalization should help consumers accurately understand the degree of the risks as well as the benefits of the service so that consumers can make better decisions. In addition, practitioners should minimize conflicts arising from an ambivalent state through efforts such as enhancing trust by clarifying the company's privacy policy and giving consumers the choice of opting out.⁶

Because consumers who are ambivalent toward PTs make their decisions after considering the benefits and risks of using personalized services, they can be a highly loyal customer group in the long term.³¹ In this respect, careful identification of the characteristics and purchase patterns is required of such ambivalent consumers as a target group in planning marketing strategies.

Lastly, gender differences should be considered in formulating communication strategies. The findings suggest that female consumers may experience more conflicts than male consumers; thus, a communication strategy that highlights the benefits of LBMC more clearly should be employed. However, male consumers are less likely to experience conflicts than female consumers but are more likely to be affected by them when they do experience them. Thus, conflict resolution methods should be accessible and effectively communicated to male consumers.

6. LIMITATIONS AND FUTURE RESEARCH

By distinguishing "ambivalence" and "internal conflict," this study revealed that ambivalence can have both a negative effect (in that it yields conflict) and a positive effect (in that it promotes use intent) on promoting LBMC. However, our research is limited in the sense that it focused solely on the LBMC context. Thus, in order to establish a firm theory of consumer ambivalence towards technology, the model needs to be tested in more diverse situations.

Second, other variables could moderate the effects of internal conflicts. Variables such as trust, consumers' innovativeness, and service involvement may impact the effect of internal conflicts on intention to use and adopt technology in an ambivalent state. These should be tested

empirically in future research.

Another possible extension of this study could be the use of different consumer groups. The data were only collected in South Korea, and thus the study's findings may not be generalized to other geographical and cultural areas. Since attitudes toward technology have been reported to exhibit significant differences by age, cultural background,⁵² and basic personality traits,⁵³ verifying the validity of a research model and analyzing the differences according to these variables would be meaningful as a subject of future research.

7. ACKNOWLEDGEMENTS

This study was supported by a research fund from Chungnam National University in 2017.

8. REFERENCES

- [1] M. Buchanan-Oliver, A. Cruz, and J. E. Schroeder, Shaping the body and technology: Discursive implications for the strategic communication of technological brands. *European Journal of Marketing*, 44(5), p635-652, 2010. <http://dx.doi.org/10.1108/03090561011032306>
- [2] R. V. Kozinets, Technology/ideology: How ideological fields influence consumers' technology narratives. *Journal of Consumer Research*, 34(6), p865-881, 2008. <http://dx.doi.org/10.1086/523289>
- [3] S. M. Bettany, B. Kerrane, and M. K. Hogg, The material-semiotics of fatherhood: The co-emergence of technology and contemporary fatherhood. *Journal of Business Research*, 67(7), p1544-1551, 2014. <http://dx.doi.org/10.1016/j.jbusres.2014.01.012>
- [4] P. E. Kourouthanassis, and G. M. Giaglis, Introduction to the special issue mobile commerce: the past, present, and future of mobile commerce research. *International Journal of Electronic Commerce*, 16(4), p5-18, 2012. <http://dx.doi.org/10.2753/JEC1086-4415160401>
- [5] H. Yun, D. Han, and C. C. Lee, Understanding the use of location-based service applications: Do privacy concerns matter? *Journal of Electronic Commerce Research*, 14(3), p215-230, 2013.
- [6] J. M. Lee, and J. Y. Rha, Personalization-privacy paradox and consumer conflict with the use of location-based mobile commerce. *Computers in Human Behavior*, 63, p453-462, 2016. <http://dx.doi.org/10.1016/j.chb.2016.05.056>
- [7] N. F. Awad, and M. S. Krishnan, The personalization privacy paradox: an empirical evaluation of information transparency and the

- willingness to be profiled online for personalization. *MIS Quarterly*, 30(1), p13-28, 2006. <http://dx.doi.org/10.2307/25148715>
- [8] J. Sutanto, E. Palme, C. H. Tan, and C. W. Phang, Addressing the personalization-privacy paradox: An empirical assessment from a field experiment on smartphone users. *MIS Quarterly*, 37(4), p1141-1164, 2013.
- [9] H. Xu, X. R. Luo, J. M. Carroll, and M. B. Rosson, The personalization privacy paradox: An exploratory study of decision making process for location-aware marketing. *Decision Support Systems*, 51(1), p42-52, 2011. <http://dx.doi.org/10.1016/j.dss.2010.11.017>.
- [10] V. Venkatesh, and M. G. Morris, Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 24(1), p115-139, 2000. <http://dx.doi.org/10.2307/3250981>.
- [11] G. Y. Nenkov, J. J. Inman, and J. Hulland, Considering the future: The conceptualization and measurement of elaboration on potential outcomes. *Journal of Consumer Research*, 35(1), p126-141, 2008. <http://dx.doi.org/10.1086/525504>.
- [12] L. Lapointe, and A. Beaudry, Identifying it user mindsets: acceptance, resistance and ambivalence. IEEE, *Hawaii International Conference on System Sciences*, 47, p4619-4628, 2014. <http://dx.doi.org/10.1109/HICSS.2014.568>.
- [13] F. van Harreveld, H. U. Nohlen, and I. K. Schneider, Chapter Five-The ABC of Ambivalence: Affective, behavioral, and cognitive consequences of attitudinal conflict. *Advances in Experimental Social Psychology*, 52, p285-324, 2015.
- [14] J. T. Cacioppo, and G. G. Berntson, Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates. *Psychological Bulletin*, 115(3), p401-423, 1994. <http://dx.doi.org/10.1037/0033-2909.115.3.401>.
- [15] P. A. van Lange, A. W. Kruglanski, and E. T. Higgins, *Handbook of Theories of Social Psychology*. Sage Publications, California, 2011.
- [16] S. Costarelli, and P. Colloca, The effects of attitudinal ambivalence on pro-environmental behavioural intentions. *Journal of Environmental Psychology*, 24(3), p279-288, 2004. <http://dx.doi.org/10.1016/j.jenvp.2004.06.001>.
- [17] E. Penz, and M. K. Hogg, The role of mixed emotions in consumer behaviour: Investigating ambivalence in consumers' experiences of approach-avoidance conflicts in online and offline settings. *European Journal of Marketing*, 45(1/2), p104-132, 2011. <http://dx.doi.org/10.1108/03090561111095612>.

- [18] J. R. Thornton, Ambivalent or indifferent? Examining the validity of an objective measure of partisan ambivalence. *Political Psychology*, 32(5), p863-884, 2011. <http://dx.doi.org/10.1111/j.1467-9221.2011.00841.x>.
- [19] M. Bui, C. M. Droms, and G. Craciun, The impact of attitudinal ambivalence on weight loss decisions: Consequences and mitigating factors. *Journal of Consumer Behaviour*, 13(4), p303-315, 2014. <http://dx.doi.org/10.1002/cb.1475>.
- [20] S. O. Olsen, J. Wilcox, and U. Olsson, Consequences of ambivalence on satisfaction and loyalty. *Psychology & Marketing*, 22(3), p247-269, 2005. <http://dx.doi.org/10.1002/mar.20057>.
- [21] J. R. Priester, and R. E. Petty, The gradual threshold model of ambivalence: Relating the positive and negative bases of attitudes to subjective ambivalence. *Journal of Personality and Social Psychology*, 71(3), p431-449, 1996. <http://dx.doi.org/10.1037/0022-3514.71.3.431>.
- [22] C. T. Fong, The effects of emotional ambivalence on creativity. *Academy of Management Journal*, 49(5), p1016-1030, 2006. <http://dx.doi.org/10.5465/AMJ.2006.22798182>.
- [23] C. J. Armitage, and M. A. Arden, Felt and potential ambivalence across the stages of change. *Journal of Health Psychology*, 12(1), p149-158, 2007. <http://dx.doi.org/10.1177/1359105307071749>.
- [24] C. C. Bee, and R. Madrigal, Consumer uncertainty: The influence of anticipatory emotions on ambivalence, attitudes, and intentions. *Journal of Consumer Behaviour*, 12(5), p370-381, 2013. <http://dx.doi.org/10.1002/cb.1435>.
- [25] P. Castro, M. Garrido, E. Reis, and J. Menezes, Ambivalence and conservation behaviour: An exploratory study on the recycling of metal cans. *Journal of Environmental Psychology*, 29(1), p24-33, 2009. <http://dx.doi.org/10.1016/j.jenvp.2008.11.003>.
- [26] P. Sharma, M. K. Erramilli, C. Chung, and B. Sivakumaran, Consumer ambivalence toward contraception-towards an integrative framework. *International Journal of Pharmaceutical and Healthcare Marketing*, 9(2), p95-117, 2015. <http://dx.doi.org/10.1108/IJPHM-03-2013-0007>
- [27] T. Brockmeyer, M. G. Holtforth, T. Krieger, D. Altenstein, N. Doerig, H. C. Friederich, and H. Bents, Ambivalence over emotional expression in major depression. *Personality and Individual Differences*, 54(7), p862-864, 2013. <http://dx.doi.org/10.1016/j.paid.2012.12.002>.
- [28] P. E. Tetlock, A value pluralism model of ideological reasoning. *Journal of Personality and Social Psychology*, 50(4), p819-827, 1986. <http://dx.doi.org/10.1037/0022-3514.50.4.819>.

- [29] K. Jonas, P. Broemer, and M. Diehl, Attitudinal ambivalence. *European Review of Social Psychology*, 11(1), p35-74, 2000. <http://dx.doi.org/10.1080/14792779943000125>.
- [30] A. Feenberg, The ambivalence of technology. *Sociological Perspectives*, 33(1), p35-50, 1990. <http://dx.doi.org/10.2307/1388976>.
- [31] B. Ploderer, W. Smith, S. Howard, J. Pearce, and R. Borland, Things you don't want to know about yourself: Ambivalence about tracking and sharing personal information for behaviour change. In *Proceedings of the 24th Australian Computer-Human Interaction Conference*, Melbourne, Australia, ACM, p489-492, 2012. <http://dx.doi.org/10.1145/2414536.2414610>.
- [32] C. Otnes, T. M. Lowrey, and L. J. Shrum, Toward an understanding of consumer ambivalence. *Journal of Consumer Research*, 24(1), p 80-93, 1997. <http://dx.doi.org/10.1086/209495>.
- [33] D. Bendall-Lyon, and T. L. Powers, The impact of gender differences on change in satisfaction over time. *Journal of Consumer Marketing*, 19(1), p12-23, 2002. <http://dx.doi.org/10.1108/07363760210414925>.
- [34] C. Yang, and C. C. Wu, Gender and Internet consumers' decision-making. *CyberPsychology & Behavior*, 10(1), p86-91, 2007. <http://dx.doi.org/10.1089/cpb.2006.9988>.
- [35] D. Gefen, and D. W. Straub, Gender differences in the perception and use of e-mail: An extension to the technology acceptance model. *MIS Quarterly*, 21(4), p389-400, 1997. <http://dx.doi.org/10.2307/249720>.
- [36] V. Venkatesh, J. Y. Thong, and X. Xu, Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), p157-178, 2012.
- [37] Y. S. Wang, M. C. Wu, and H. Y. Wang, Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, 40(1), p92-118, 2009. <http://dx.doi.org/10.1111/j.1467-8535.2007.00809.x>.
- [38] J. G. Moulard, D. H. Rice, C. P. Garrity, and S. M. Mangus, Artist authenticity: How artists' passion and commitment shape consumers' perceptions and behavioral intentions across genders. *Psychology & Marketing*, 31(8), p576-590, 2014.
- [39] C. Chai, X. Wu, D. Shen, D. Li, and K. Zhang, Gender differences in the effect of communication on college students' online decisions. *Computers in Human Behavior*, 65, p176-188, 2016. <http://dx.doi.org/10.1016/j.chb.2016.07.012>.
- [40] W. K. Darley, and R. E. Smith, Gender differences in information processing strategies: An empirical test of the selectivity model in advertising response. *Journal of Advertising*, 24(1), p 41-56, 1995.

- [41] J. Meyers-Levy, and D. Maheswaran, Exploring differences in males' and females' processing strategies. *Journal of Consumer Research*, 18(1), p63-70, 1991. <http://dx.doi.org/10.1086/209241>.
- [42] K. J. Kaplan, On the ambivalence-indifference problem in attitude theory and measurement: A suggested modification of the semantic differential technique. *Psychological Bulletin*, 77(5), p361-372, 1972. <http://dx.doi.org/10.1037/h0032590>.
- [43] R. K. Chellappa, and R. G. Sin, Personalization versus privacy: An empirical examination of the online consumer's dilemma. *Information Technology and Management*, 6(2-3), p181-202, 2005. <http://dx.doi.org/10.1007/s10799-005-5879-y>.
- [44] S. J. Breckler, A comparison of numerical indexes for measuring attitude ambivalence. *Educational and Psychological Measurement*, 54(2), p350-365, 1994. <http://dx.doi.org/10.1177/0013164494054002009>.
- [45] M. M. Thompson, M. P. Zanna, and D. W. Griffin, Let's not be indifferent about 'attitudinal' ambivalence. In Petty, R. E., and Krosnik, J. A. (Eds.), *Attitude strength: Antecedents & consequences*: p361-386. Hillsdale, NJ: Lawrence Erlbaum Associates, 1995.
- [46] M. Mäntymäki, and J. Salo, Teenagers in social virtual worlds: Continuous use and purchasing behavior in Habbo Hotel. *Computers in Human Behavior*, 27(6), p2088-2097, 2011.
- [47] K. A. Bollen, A new incremental fit index for general structural equation models. *Sociological Methods & Research*, 17(3), p303-316, 1989. <http://dx.doi.org/10.1177/0049124189017003004>
- [48] J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham, *Multivariate Data Analysis*. Upper Saddle River, NJ: Pearson Prentice Hall, 2006.
- [49] C. Fornell, and D. F. Larcker, Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), p39-50, 1981. <http://dx.doi.org/10.2307/3151312>
- [50] R. M. Baron, and D. A. Kenny, The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), p1173-1182, 1986. <http://dx.doi.org/10.1037/0022-3514.51.6.1173>
- [51] S. L. Fielden, and M. J. Davidson, Stress and gender in unemployed female and male managers. *Applied Psychology*, 50(2), p305-334, 2001. <http://dx.doi.org/10.1111/1464-0597.00060>
- [52] S. M. Elias, W. L. Smith, and C. E. Barney, Age as a moderator of attitude towards technology in the workplace: Work motivation and overall job satisfaction. *Behaviour & Information Technology*, 31(5),

- p453-467, 2012. <http://dx.doi.org/10.1080/0144929X.2010.513419>
- [53] K. A. Barford, and L. D. Smillie, Openness and other Big Five traits in relation to dispositional mixed emotions. *Personality and Individual Differences*, 102, p118-122, 2016. <http://dx.doi.org/10.1016/j.paid.2016.07.002>

APPENDIX

Measurement items

| Construct | Item |
|-------------------------|--|
| Personalization benefit | <i>By using LBMC,</i> |
| | I can get personalised information tailored to my interests and needs. |
| | I can get personalised information tailored to my activity contexts. |
| | I can get personalised information tailored to my shopping patterns. |
| | I can reduce my time and effort in finding the shopping information I need. |
| | I can get shopping information more easily and conveniently. |
| | I can feel the pleasure to get personalised information. |
| | I can experience more fun and lively shopping. |
| Privacy risk | <i>By using LBMC,</i> |
| | I am at the risk of infringement of my privacy. |
| | I am at the risk of my personal information being excessively collected. |
| | My personal information is at the risk of being accessed by unauthorized people. |
| | My actions are at the risk of being tracked and monitored. |
| | There is high potential for loss of safety. |
| | I am at the risk of many unexpected problems. |
| Internal conflict | <i>I am _____ to use LBMC.</i> |
| | not at all conflicted/completely conflicted |
| | not at all indecisive/completely indecisive |
| | not at all tense/completely tense |
| | not at all confused/completely confused |
| Intention to use LBMC | I intend to continue using LBMC. |
| | I intend to purchase from LBMC in the future. |
| | I intend to recommend using LBMC to my friends. |