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Citation for final published version:

Jang, Seongsoo ORCID: <https://orcid.org/0000-0002-5948-0876>, Chong, Kiwon and Yoo, Changjo 2021. The effect of mobile application-driven customer participation on bakery purchase behavior: evidence from a field experiment. *International Journal of Hospitality Management* 94 , 102865. 10.1016/j.ijhm.2021.102865 file

Publishers page: <https://doi.org/10.1016/j.ijhm.2021.102865>
<<https://doi.org/10.1016/j.ijhm.2021.102865>>

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The effect of mobile retailer app-driven customer participation on
bakery purchase behavior: Evidence from a field experiment

Accepted at International Journal of Hospitality Management

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Abstract

This paper empirically examines individual and joint effects of two types of customer participation (CP)—mandatory and replaceable—within a mobile app on bakery purchase behavior. This research conducts a field experiment to track customer decisions on whether to participate in in-app CP events—store loyalty program enrollment and store satisfaction survey—and whether to change their purchasing amount and frequency. After controlling other influencing factors, the authors performed ANOVA with the sample of 19,065 bakery customers' behavioral decisions. The results confirm that mandatory CP has a positive effect on purchase behavior, while replaceable CP has mixed effects across stores. In addition, the results confirm that customers who engaged in both types of CP increased their purchase amount and frequency, compared to customers who engaged in one type or neither. The study suggests hospitality firms should motivate customers to engage in mandatory and replaceable CP to enhance customer loyalty cost-effectively.

Keywords: Mobile retailer app, Customer participation, Mandatory participation, Replaceable participation, Purchase behavior

1. Introduction

Mobile retailer applications (“retailer apps”), as one type of popular cost-effective marketing tools, offer a way to adopt “pull” rather than “push” marketing activities, because customers download the apps, interactively communicate with the firms, and give feedback on the offered products and services (Bellman et al., 2011). Retailer app-driven information convenience and reward convenience stimulate existing customers’ program participation (Wang et al., 2018). Hence, customer participation (CP) within retailer apps can be reflected in the cocreation of personalized hotel services (Lei et al., 2019) and further lead to guests’ unplanned spending in hotels (Morosan and DeFranco, 2019). However, little attention is paid to whether hospitality retailer apps can benefit from encouraging customers to participate in firm-initiated programs and events; however, most studies simply focus on why customers download mobile hospitality apps (Kwon et al., 2013), what motivates consumers to adopt mobile hospitality and travel apps (Okumus et al., 2018; Rivera et al., 2016; Zhu et al., 2016), and how customers respond to restaurant self-service technology (Ahn and Seo, 2018). It is not clear how hospitality and tourism firms encourage customers to engage in the various forms of CP within retailer apps and how such CP relates to the achievement of company goals (e.g., customer loyalty and retention) (Chathoth et al., 2020).

Given the importance of retailer app-driven CP, extant studies have examined consequences of CP in terms of customer satisfaction, behavioral intentions, and service quality (Dong and Sivakumar, 2017). While some researchers find that increasing CP has a positive effect on service outcomes (e.g., Chan et al., 2010), others find a negative (e.g., Blut et al., 2020) or non-significant effect (e.g., Ennew and Binks, 1999). Researchers also find that CP has positive effects on service quality and willingness to pay but mixed effects on satisfaction and purchase intentions (Dong and Sivakumar, 2017). Such mixed and contradictory effects

may derive from a failure to (1) identify different participation types, (2) consider the role of CP in different industries, and/or (3) evaluate the individual and combined effects of CP (Dong and Sivakumar, 2017). Methodologically, prior hospitality studies have mainly measured performance outcomes through survey-based satisfaction ratings and (re)purchase intentions (e.g., Jiang et al., 2019; Kim et al. 2019; Sarmah et al. 2017). However, there exist differences between stated intentions and actual purchases, due to biased reports of intentions (Kahneman and Snell, 1992) and changes in intention determinants over time (Infosino, 1986). Even if customers have the same level of satisfaction, purchase behaviors may be different among different customer groups (Mittal and Kamakura, 2001), implying there may be limitations to using satisfaction ratings and intentions to predict purchase behavior.

To fill these gaps, this study attempts to investigate whether customer purchase behavior is influenced by two types of CP within retailer apps—mandatory CP (i.e., customer activities/resources that can only be performed/provided by customers) and replaceable CP (i.e., CP-related tasks that can be performed by service providers or other intermediaries) (Dong and Sivakumar, 2017). Specifically, we empirically examine individual and joint effects of different forms of in-app CP on purchase amount and purchase frequency in a hospitality setting. For this study, we conduct a field experiment to track and collect real data on (1) customer (non)participation in two firm-initiated CP events and (2) purchase histories over one year, at two bakery franchise stores in South Korea. The franchise firm operated a retailer app that allowed app users to voluntarily do two types of CP—(1) voluntarily enrolling in a store-level loyalty program for which voluntary enrollments were essential for store-based marketing campaigns (mandatory CP) and (2) voluntarily filling out an in-app store satisfaction survey that was run by the retailer, but could also be performed by a third-party research firm (replaceable CP). A holistic understanding of the CP effectiveness from the field experiment in natural settings will offer meaningful implications for other hospitality managers, allowing

them to design CP events for improving customers' behavioral loyalty and retention (Hao, 2020).

2. Literature review

2.1. Customer participation

Dabholkar (1990, p. 484) defines CP as “the degree to which the customer is involved in producing and delivering the service.” As customers are active resource integrators in value co-creation (Arnould, 2008), customer roles can substitute for service employees' work (Heidenreich et al., 2014) or support service enhancement (Kellogg et al., 1997). Researchers have described CP using other terms, namely, (1) co-production, including self-production (Haumann et al., 2015) and self-service technology (Etgar, 2008), and (2) co-creation, including self-service (Zainuddin et al., 2016) and interaction with firms (Grönroos and Voima, 2013). Vargo and Lusch (2016) describe co-production as customers' involvement in the service production/delivery process, while value co-creation involves the actions of multiple actors, contributing to each other's well-being. However, CP covers all forms of service interactions between firms and customers, and among customers, and can depict both active and passive participation (Dong and Sivakumar, 2017).

Based on two elements (i.e., who makes the exchange and what is exchanged) (Vargo and Lusch, 2008), CP can be classified into three categories: mandatory, replaceable, and voluntary (Dong and Sivakumar, 2017). Mandatory CP is defined as customer activities that can only be performed by customers and are essential for service delivery (Dong and Sivakumar, 2017). Examples of mandatory CP can involve people (e.g., the customer's presence for a hotel stay) and preference (e.g., the enrollment of a hotel membership) (Lei et

al., 2019). Conversely, replaceable CP refers to customer activities that can also be performed by others (e.g., agents, intermediaries) but are essential for service provision (Lovelock and Young, 1979). Examples include hotel self check-in/out (Lei et al., 2019; Morosan and DeFranco, 2019) and meal preparation through a food delivery app (Cho et al., 2020; Ray et al., 2019). Finally, voluntary CP refers to customer activities that are not essential to service delivery but can improve customers' service experience (Bettencourt, 1997). Examples would be using own mobile device to connect to other in-room technologies (e.g., TV) to view content (Morosan, 2018). Although mandatory and replaceable CP clearly differ from each other, voluntary CP can be mixed with other types of CP (e.g., CP can be both mandatory and voluntary) (Mende and van Doorn, 2015). Hence, this study focuses on two types of CP (mandatory and replaceable).

2.2. Retailer apps and customer participation

Researchers have been investigating various CP behaviors within retailer apps. Retailer apps enable customers to participate in service delivery or self-generate benefits in the absence of a firm's employees (Robertson et al., 2016). Retailer apps serve as meaningful points of access to retailers' services that customers can proactively integrate into their lives in various ways (Belk, 2013). Firms often encourage app-customer interactions in the hope that customers will intensify their connections to the apps (Peng et al., 2014). Prior studies have found that customers use retailer apps mainly to manage/receive coupons and discounts, for greater convenience, and to seek more engagement with the retailers (van Heerde et al., 2019). However, retailer apps are an ideal mobile marketing and online customer engagement tool (Hao, 2020; Lee, 2018) because they can be either push-based, involving communication via

messages and coupons sent to mobile devices, or pull-based, where a user requests and controls the information obtained from a firm (Bellman et al., 2011).

According to the service-dominant logic, customers are regarded as proactive value co-creators rather than as passive receivers of value (Vargo and Lusch, 2004), and firms are viewed as facilitators of the value co-creation process (Chan et al., 2010). CP can reflect efforts related to co-producing a service (Chan et al., 2010), and such participation in retailer apps is a critical component of the value co-creation process. However, there is limited attention directed toward understanding the types of CP that occur in retailer apps, and their independent and interactive effects on customers' purchase behavior (Dinner et al., 2015). Researchers have demonstrated that, overall, CP positively affects the co-creation of enjoyment, and economic and relational value (Chan et al., 2010; Yim et al., 2012), which in turn lead to customer satisfaction and loyalty (Chen and Wang, 2016). However, most CP studies have not only paid less attention to the roles and outcomes of CP in retailer apps but also relied heavily on the self-reported behavioral approach to capture the level of CP in service provision.

2.3. In-app customer participation and purchase behavior

Retailer apps provide customers with an interactive way to experience a brand using advanced features (Bellman et al., 2011), such as mobility-based online activity (e.g., user control and responsiveness) and contextual offers based on personal identity and location (Lee, 2005). The interactivity of retailer apps motivates customers to download and use them (Kang et al., 2015). Prior studies have emphasized the importance of different types of interactivity in increasing customers' affective involvement with the apps (Coursaris and Sung, 2012) and determining customers' purchase intentions (Kim et al., 2015). Such interactivity of retailer apps is closely related to social value, which derives from the ability of a product or service to

enhance the social self (Lei et al., 2020). When customers use retailer apps, they are likely to seek social interaction benefits, for example, through mixing with other users within the same retailer app-driven loyalty program (Alnawas and Aburub, 2016). In the hospitality industry, interactive technologies (e.g., kiosks and mobile apps) enable customers to engage in value co-creation, which further increases their unplanned spending (Morosan and DeFranco, 2019).

Given that the interactive nature of retailer apps creates social value, customers are often willing to participate in firm-initiated in-app events to obtain loyalty marks, and share about them on social media to enhance their social capital (Narang and Shankar, 2016). Researchers have investigated how social value enhances customer satisfaction with an app (William and Soutar, 2009) and facilitates the transfer of affect to the brand (Martinez and De Chernatony, 2004). Although retailer apps are regarded as a supplement to the overall retail experience (van Heerde et al., 2019), their convenience and interactivity influence customers' cognitive and affective involvement with them (Kang et al., 2015). Recent literature suggests that retailer app adoption increases customers' purchase incidence, frequently, and amount; the effect is stronger for less loyal customers (Liu et al., 2019). Additionally, retailer app adopters increase their purchases in both online and offline channels (Narang and Shankar, 2019).

In the hospitality literature, research on CP is mainly decomposed into two streams. Research in one stream has documented determinants and outcomes of CP in the hospitality context. For example, information sharing between customers and the firm and customers' responsible behavior are critical CP components in exhibitions (Wong and Lai, 2018). Ahn et al. (2019) find that customers' co-creation attitudes, such as interaction, knowledge sharing, and responsive attitude, influence co-creation behaviors (i.e., participation behavior and citizenship behavior) toward a resort service brand. Kim et al. (2019) also show that customer's perceived innovativeness leads to value co-creation behavior, which further enhances customer satisfaction and loyalty at restaurants. The other stream of the CP research deals with mobile

app-based CP behaviors. For instance, Lei et al. (2019) explore how hoteliers leverage mobile apps to innovate service provisions (e.g., personalized experiences) through co-creating with customers. Lei et al. (2020) also study the firm-customer interactions through mobile instant messaging (IM) and find the influencing factors (e.g., social presence, media richness) and effects (e.g., personalization) of IM-based co-creation experience in tourism and hospitality areas (e.g., hotels, restaurants, and attractions). The general consensus is that customers' personal innovativeness leads to willingness to co-create value using mobile apps, which further enhances their intentions to adopt co-created new services at hotels (Morosan, 2018; Sarmah et al., 2017).

However, these hospitality studies have focused more on the antecedents of CP activities or perceived outcomes of CP behavior, but less on different types of in-app CP behavior and change in post-CP behavioral loyalty. Although Morosan and DeFranco (2019) measure customers' unplanned spending in hotels, their measurement was based on self-reported 5-point scales and their model could not controlling for other influencing factors in the CP-spending causal relationship. Therefore, this research attempts to (1) hypothesize the independent and joint effects of two types of in-app CP (i.e., mandatory and replaceable) on hospitality customers' purchase behavior and (2) conduct a field experiment to examine the causal relationship between CP and behavioral loyalty.

3. Hypotheses

3.1. In-app mandatory customer participation

Mandatory CP occurs when customers have mandatory production roles that can ensure successful service delivery (Zeithaml et al., 2006). For example, firms need customers to

register in order to successfully deliver personal fitness training and loyalty programs. Mandatory CP is a responsibility-type behavior, which means that customers have duties and responsibilities they must fulfill in order for firms to deliver a successful service to them (Ennew and Binks, 1999). In the context of service co-creation, customers may exert different levels of effort over a large spectrum, ranging from noncompliance (low CP) to minimal compliance (moderate CP) to active engagement (high CP) (Bitner et al., 1997; Ouschan et al., 2006). When customers face an event that requires mandatory participation, the task is likely to involve a high level of customer effort (high CP), which is conceived as behavioral involvement (Stebbins, 1992).

According to the commitment-trust theory (Morgan and Hunt, 1994), relationship commitment—an enduring desire to maintain a valued relationship (Moorman et al., 1992)—and trust—a willingness and confidence to rely on an exchange partner (Moorman, Deshpandé, and Zaltman, 1993)—are central to successful relationship marketing. Researchers suggest that customers who are committed to a relationship with a firm are likely to remain consistent in their commitment (Moorman et al., 1993). Such relationship commitment and trust will engender long-term cooperation with the firm, in addition to a reduced tendency to leave the exchange relationship and reduced uncertainty (Morgan and Hunt, 1994).

When a customer devotes themselves to engaging in mandatory participation in the retailer's successful service delivery, this mandatory CP behavior is indicative of commitment and trust in the primary store, which then prompts a long-term healthy relationship with the store (Morgan and Hunt, 1994). In this study, when a hospitality customer enrolls in a store-level loyalty program by registering his or her primary store through a retailer app, the mandatory enrollment will prompt more relational behaviors and higher motivation levels regarding purchase frequency and share of wallet, because members join on their own initiative (Chen et al., 2015). Furthermore, the self-determination theory suggests that self-determined

choices of mandatory enrollment are accompanied by greater motivation, effort, persistence, and engagement over long periods than are firm-determined choices (i.e., firm-driven enrollment) (Ryan and Deci, 2002). Hence, we hypothesize the following:

H1. Mandatory customer participation in hospitality apps will positively influence customer purchase behavior.

3.2. In-app replaceable customer participation

Replaceable CP relates to tasks that are performed by service providers (e.g., firms and firm-contracted agents) or customers (Lovelock and Young, 1979). In a replaceable CP context, customers take the place of employees, and the service can be produced and delivered without employee involvement. Replaceable CP includes many self-service activities, which can also be performed by service providers, using self-service technology (SST) (e.g., restaurant self-service kiosk) or not (e.g., assembling IKEA furniture). The CP literature suggests that mandatory CP is more likely to lead to desirable outcomes, but replaceable CP can provide positive or negative effects (Dong and Sivakumar, 2017).

According to Atakan et al. (2014), customers may have psychological responses to self-production activities across stages; CP in the design and production stages enhances affective commitment and in turn enhances evaluation of the self-made product. Especially during the production stage, consumers put physical effort into making, assembling, or modifying a product or service, which generates the “IKEA effect”—physical labor leads to love for the object (Norton et al., 2012). Conversely, co-production intensity may negatively affect customers’ satisfaction because it involves nonmonetary costs that add to their total input into the co-production process and thereby impair the input/output ratio (Haumann et al., 2015).

Furthermore, replaceable CP is significantly related to attitudinal loyalty but not to behavioral loyalty, although attitudinal loyalty does in turn positively affect behavioral loyalty (Auh et al., 2007).

In a hospitality app context, a high level of interaction between customers and brands often enhances the effectiveness of brand-related messages within the app (Rivera et al., 2016). When implementing replaceable CP events (e.g., acquiring customer-reported feedback, not from a research firm) during the production process, hospitality apps can employ value-enhancing and/or intensity-reducing communication strategies, which further mitigate the negative effects of replaceable CP derived from the co-production intensity (Haumann et al., 2015). In addition, interactive communication within hospitality apps can establish strong firm-customer relationships (van Heerde et al., 2019) and build trust, by managing customers' queries, concerns, and expectations (Rivera et al., 2016), which will make replaceable CP more effective (Auh et al., 2007). Therefore, we hypothesize the following:

H2. Replaceable customer participation in hospitality apps will positively influence customer purchase behavior.

3.3. In-app mandatory and replaceable customer participation

When customers actively engage in both types of CP (i.e., mandatory and replaceable), their CP behaviors may increase their level of trust and commitment, which better explains the firm-customer connection (Prahalad, 2004). Customers' involvement in both mandatory and replaceable CP is likely to show a high level of trust, because one party (customers) has confidence in an exchange partner (firm)'s reliability and integrity (Morgan and Hunt, 1994). Such trust is regarded as a precursor to relationship commitment (Morgan and Hunt, 1994),

which implies an enduring desire and willingness to work at maintaining the firm-customer relationship (Moorman et al., 1992). Studies have demonstrated that commitment can be the result of emotional attachment or cognitive calculation (Geyskens et al., 1996).

However, literature also suggests that combining mandatory and replaceable CP can lead to a positive or a negative effect (Dong and Sivakumar, 2017). When CP is performed using technology-based services, firms can improve service effectiveness in successful cases (Weitjers et al., 2007), whereas failed co-creation is detrimental because the service performance falls short of customers' expectations (Heidenreich et al., 2014). From a longitudinal perspective, if customers continue to engage in both types of CP within a retailer app, they must be satisfied with the co-created service within the app and choose to use the app, among a variety of other retailer apps. Hence, in-app mandatory and replaceable CP over time drives higher customer satisfaction through the creation of economic value (e.g., better service quality, customized service, and increased control) and relational value (e.g., communication and relationship building between customers and firms) (Chan et al., 2010; van Heerde et al., 2019). This logic can be applied in both retail and hospitality context. Based on these discussions, the following hypothesis is established:

H3. Replaceable customer participation in hospitality apps strengthens the positive relationship between mandatory customer participation and purchase behavior.

Based on the aforementioned theoretical foundations, we concentrate on the individual and combined effects of mandatory and replaceable CP on purchase behavior of hospitality customers, with a consideration of other influencing factors (i.e., age, gender, and loyalty membership). Figure 1 depicts the proposed research model and outlines the research hypotheses.

[Insert Figure 1 about here]

4. Method

4.1. Data collection

Among the numerous empirical operationalizations of CP, we adopt the studies of Chan et al. (2010) and Yim et al. (2012) that define CP as a customer's activities involving sharing information, providing suggestions, and making decisions, and apply them to the context of a retailer app. One of the authors, as a full-time employee of a South Korean bakery franchise firm, designed two post-install CP events within the firm's mobile retailer app and tracked customers' behavioral responses (i.e., participation and purchases) in it. One event was primary store registration. In this event, the firm launched a store-level loyalty program that enabled individual stores to conduct their own promotional activities. To run this program, each store needed customers to enroll by registering their primary stores through the retailer app. Hence, customers' information sharing is considered a type of mandatory CP because it is essential for operating the loyalty program.

The other event was a store satisfaction survey within the app. To monitor the level of customer satisfaction with individual stores' products and services, the app users could open up the app, select a certain store (that they had purchased products from), and fill out a questionnaire consisting of customer evaluations of product quality, product variety, employee service, and store ambience. Store owners could thereby check how satisfied participating customers were with their store and use the customer feedback to enhance future offerings. This survey task was performed by the customers and thus replaced the work of the firm or other research firms, therefore representing a form of replaceable CP.

A field experiment using these two CP events (i.e., primary store registration and the store satisfaction survey) was conducted from April 2017 to November 2017 (8 months). We tracked individual customers' purchase behaviors (i.e., purchase amount and purchase frequency) for two months before and after the one-month CP event period (i.e., June, July, August, and September). During the two-month period after the CP events, no promotional messages related to the two CP events were delivered to customers, whether or not they had participated in the events. For example, for customers who participated or did not participate in the CP event in June (i.e., an experiment period), we monitored the change in the purchase behavior of the two groups between the before-event (April and May) and the after-event (July and August) periods. To check robustness of the results and examine the heterogeneity of customers across stores, we chose two stores: one located in a residential area (Store A) and the other located in a commercial area (Store B). The final sample consisted of 7,596 anonymized customers that made actual purchases at Store A and 11,469 customers of Store B, totaling 19,065. Table 1 shows the demographic descriptions of the customers who participated in this field experiment at the two stores.

[Insert Table 1 about here]

4.2. Variables

Four types of customer purchase behavior—2 (purchase amount, M , and purchase frequency, F) \times 2 (one month and two months)—were used as dependent variables. Based on the specific month (t_3) when a particular customer participated in the CP event, we measured the changed dollar spending amount or purchase frequency for one month ($t_4 - t_2$) or two months ($t_{4+5} - t_{1+2}$) before and after the one-month CP testing period (t_3). The four dependent variables consist of (1) the one-month change in amount ($M_{t_4} - M_{t_2}$), (2) the one-month

change in frequency ($F_{t_4} - F_{t_2}$), (3) the two-month change in amount ($M_{t_{4+5}} - M_{t_{1+2}}$), and (4) the two-month change in frequency ($F_{t_{4+5}} - F_{t_{1+2}}$). Regarding independent variables, this study distinguished customers who participated in the event from those who did not. In the retailer app, if a customer registered a primary store and/or filled out a store satisfaction survey, they became a participating customer. Customers who neither selected their primary store nor filled out the survey were classified as not participating.

We controlled for three demographic and loyalty factors, namely, age, gender, and membership class, of the observed customers in the model because these factors could lead to different repurchase behaviors (Mittal and Kamakura, 2001). First, as customers age, they are likely to have greater loyalty to their product/service providers (Daughtrey et al., 2013). Second, male and female customers tend to have different attitudinal and behavioral orientations in their buying behavior (Homburg and Giering, 2001). Third, because the loyalty membership level can influence customer purchase behavior (Meyer-Waarden, 2008), we used three dummy variables for the firm-designated membership level: pink (less loyal), gold, and platinum (more loyal).

5. Results

To investigate the independent effects of primary store registration (mandatory CP) and the store satisfaction survey (replaceable CP) on purchase behavior, we conducted two tests: an independent samples t-test (to test H1 and H2 separately) and ANOVA (to test H1 and H2 simultaneously). Table 2 shows the means of the change in purchase behavior after the primary store registration event, for those who participated and those who did not: type of purchase (amount vs. frequency), length of period (one month vs. two months), and type of store (Store A vs. Store B). We found that, after primary store registration, the purchase amount increased

significantly for one month at Store A (161.58 vs. 6342.20, $t = -2.67$, $p < 0.05$) and Store B (114.77 vs. 1568.37, $t = -1.95$, $p < 0.10$) and for two months at Store A (562.58 vs. 12615.20, $t = -3.78$, $p < 0.05$) and Store B (173.03 vs. 5259.13, $t = -3.52$, $p < 0.05$). In addition, the purchase frequency of customers who participated in the primary store registration at Store A increased by 0.68 times for one month (1.18 times for two months), which was greater than the increase for those who did not participate (one month: $t = -2.97$, $p < 0.01$; two months: $t = -3.45$, $p < 0.01$). At Store B, there were significant differences in the two-month purchase amount and frequency between the two conditions (i.e., no participation and participation in the primary store registration) ($t = -2.39$, $p < 0.01$). There was also a significant difference in the one-month purchase amount but no difference in the one-month purchase frequency. Hence, the t-test results support H1.

[Insert Table 2 about here]

Regarding the event of the store satisfaction survey, the same analysis using an independent samples t-test was conducted. Table 3 shows the means of the change in purchase behavior for those who participated and those who did not participate in the store satisfaction survey across different situations. We found that CP in the store satisfaction survey (i.e., the replaceable CP) had no significant relationship with customer purchase behavior under any of the conditions, i.e., for neither purchase amount nor frequency, and regardless of observation period (one or two months) and store location (residential or commercial). A possible interpretation is that customers who participated in the mobile survey might have had heterogeneous levels of satisfaction, which would have affected their subsequent purchase behaviors. The t-test results thus do not support H2.

[Insert Table 3 about here]

To examine the mean differences among multiple situations simultaneously (H1 and H2) and the interaction effects of the two types of CP (H3), we conducted a 2×2 ANOVA

(primary store registration yes vs. no \times store satisfaction survey yes vs. no). As shown in Tables 4 and 5, customers who participated in the CP event of primary store registration (1) positively changed their purchase amount at Store A or Store B ($p < 0.05$). In addition, customers who participated in the CP event of the store satisfaction survey (2) for Store A increased their purchase amount (Model 1) and their purchase frequency (Models 2 and 4). However, customers who participated in the survey for Store B did not change their purchase behavior. Because ANOVA is more robust than a t-test because it minimizes any inflation of a Type 1 error due to multiple comparisons (Kao and Green, 2008), we use the results of ANOVA in testing H2. The results show that the mandatory CP positively changed customer purchase behavior, while the effect of the replaceable CP varied across stores. Hence, H1 (the positive effect of mandatory CP) was supported, but H2 (the positive effect of replaceable CP) was only partially supported. We will discuss the detailed implications of these results in the next section.

[Insert Table 4 & Table 5 about here]

Regarding the interaction effect, the results show that customers who participated in both the primary store registration and the store satisfaction survey for Store A increased their purchase amount and purchase frequency for one month (Model 1: $F = 4.57$, $p < 0.05$; Model 2: $F = 26.51$, $p < 0.05$) and their purchase frequency for two months (Model 4: $F = 10.44$, $p < 0.05$). Customers who participated in both events for Store B spent more and purchased more frequently for one month only (Model 5: $F = 12.72$, $p < 0.05$; Model 6: $F = 6.90$, $p < 0.05$). Figure 2 displays the interaction effect between the two CP variables. The results indicate that customers who participated in both the mandatory and replaceable CP events increased their purchase amount and frequency compared to those who only participated in one event or did not participate at all. Hence, these results only partially support H3 because the combined effects vary across stores.

[Insert Figure 2 about here]

6. Discussion and implications

Given the importance of firm-customer interactions in the hospitality service production and delivery process, understanding how to utilize mobile apps to increase CP-driven customer loyalty is important. One of the basic decisions confronting hospitality managers is what kind of CP events should be implemented to enhance customer loyalty. It is important for CP researchers and practitioners to understand the causal relationship between CP and actual purchase behavior. This study develops and tests a conceptual model of how two types of CP (i.e., mandatory and replaceable) influence customers' subsequent purchase behavior in the context of a hospitality app. Methodologically, this study conducts a field experiment that consists of in-app (non)participation behaviors in two firm-initiated CP events (i.e., primary store registration and a store satisfaction survey) and two purchase behavior outcomes (i.e., purchase amount and purchase frequency) generated by 19,065 customers at two bakery stores. This study finds that mandatory CP has a positive effect on purchase behavior, while replaceable CP has mixed effects across the stores—being non-significant or positive. In addition, this study confirms that the customers who engaged in both mandatory and replaceable CP increased their purchase amount and frequency compared to those who engaged in only one type of CP or not at all.

6.1. Theoretical implications

This study makes several theoretical contributions to the marketing and hospitality literature, especially regarding the performance impact of CP and retailer app-based CP marketing. This study answers the calls for a more fine-tuned assessment of CP, such as the

different effects each type of CP can have on customer purchase behavior (Dong and Sivakumar, 2017). First, this study contributes to the CP literature by empirically investigating the effectiveness of mandatory and replaceable CP in the hospitality app context, and finding the former to be more pronounced. This finding is aligned with the fact that customers are likely to exert different levels of effort when engaging in the two types of CP—more effort for mandatory and less for replaceable CP (Bitner et al., 1997; Ouschan et al., 2006). That is, customers' in-app effort exerted in mandatory CP leads to higher customer satisfaction and loyalty (Aggarwal and Basu, 2014; Chen et al., 2015), and in turn stimulates purchase behavior. This implies that mandatory CP should not only be thought of as behavioral involvement (Stebbins, 1992) but also as critical to successful service delivery (Ennew and Binks, 1999). Further, this finding enriches the current knowledge of value co-creation theory in the hospitality context, which mainly focuses on value co-creation processes between firms and customers without their economic value (Ahn et al., 2019; Kim et al., 2019; Wong and Lai, 2018).

Second, and interestingly, this study demonstrates that the relationship between replaceable CP and purchase behavior varies across stores. The results (Table 5) show that customers who participated in the in-app store satisfaction survey for Store A, located in a residential area, increased their purchase amount and frequency, but those at Store B, located in a commercial area, exhibited no change in their purchase behavior. Although a retailer app's interactivity can establish strong store-customer relationships (van Heerde, 2019), this finding implies that the effectiveness of replaceable CP in the service production and delivery process can vary depending on service quality (Bendapudi and Leone, 2003). In other words, when customers voluntarily participated in the satisfaction survey, some would have shown higher satisfaction and others lower. The self-serving bias theory suggests that a customer gives him- or herself (the firm) greater credit for a satisfied (unsatisfied) outcome (Campbell and Sedikides,

1999). Consequently, a possible explanation for the mixed finding is that customers who participated in the survey for Store A (Store B) were satisfied (unsatisfied) with the service quality during the observation period, therefore increasing (decreasing) their loyalty to the focal store (Heidenreich et al., 2014).

Third, this research provides empirical evidence that both mandatory and replaceable CP leads to a high level of trust and commitment, customer satisfaction, and in turn behavioral loyalty. This finding differs from prior findings showing that the combination of two types of CP can be positive, negative, or nonsignificant (Heidenreich et al., 2014). In the context of hospitality apps, firms can improve service quality through active CP (both mandatory and replaceable) and interactive communications (Weitjers et al., 2007), thereby creating economic value (e.g., a more customized service) and relational value (e.g., a close relationship between customer and firm) (Chan et al., 2010). Although some customers who engage in mandatory CP may express their lower satisfaction through a mobile survey (i.e., replaceable CP), their tendency to give the firm all the credit for the negative outcome (i.e., self-serving bias) will be mitigated because they will have become closer to the firm through the two forms of CP and thus will share both credit and blame (Campbell et al., 2000). Our longitudinal study confirms that customers' involvement in two CP events positively affects relational marketing outcomes in terms of hospitality purchase behavior.

Finally, this research makes a methodological contribution by conducting a field experiment, which strengthens the causal relationship between CP and purchase behavior, and by using multidimensional outcome variables (Hao, 2020). Prior hospitality research has largely focused on using scenario-based controlled experiments and studying customer intentions to use mobile apps (Okumus et al., 2018; Rivera et al., 2016). Although behavior can be predicted from intentions, there might exist biases in the measurement of intentions (Kahneman and Snell, 1992), the heterogeneity across customers (Mittal and Kamakura 2001),

and changes in true intentions between the time of the survey and the time of the behavior (Infosino, 1986). Whereas the literature finds mixed effects of CP on satisfaction and purchase intentions (Blut et al., 2020), this study provides robust results of the positive effects of mandatory CP and the mixed effects of replaceable CP on actual purchase behavior, which enhances the depth of CP research.

6.2. Managerial implications

This study provides useful managerial implications in the field of CP-driven hospitality marketing and mobile app management. Given the crucial impact of mandatory CP on purchase behavior, hospitality managers should encourage customers to actively engage in mandatory CP during the service production and delivery process in order to improve store loyalty (Chen et al., 2015). Our empirical study on the effectiveness of in-app primary store registration confirms that hospitality apps should be utilized as a value co-creation or service co-production facilitator (i.e., pull lever) rather than a firm-initiated sales and promotional channel (i.e., push lever). In addition, CP events can be conducted without monetary promotions (e.g., coupons and discounts) that may increase marketing costs and damage brand image (Yi and Yoo, 2011). To increase the rate of mandatory CP, marketers can provide hospitality app users with non-monetary promotions, such as new product or event announcements, or useful information about why mandatory CP will be beneficial to participating customers in the future.

When implementing replaceable CP events, hospitality managers should keep in mind that the purpose and follow-up action of a particular form of replaceable CP need to be clarified before or during the service production/delivery process. Our empirical finding indicates that, although customers engaged with the hospitality firm may participate in a store satisfaction survey as a citizenship behavior (Revilla-Camacho et al., 2015; Yen et al., 2020), they will have

psychological responses to their participation in the survey in terms of the service outcome. When most customers are not satisfied with a particular store, the store owner should enhance the level of the products and/or services accordingly, so that customers who visit the store again in the future will attribute the product and service enhancement to their participation (i.e., survey participation) and in turn increase their loyalty to the store. If individual store owners do not take any immediate action after conducting a store survey, managers from the headquarters could provide those owners with a cross-store analysis report and emphasize the importance of taking post-CP action to improve store quality.

Finally, this research demonstrates that organizing two types of CP (i.e., mandatory and replaceable) and increasing the participation rate are imperative in the hospitality industry. Managers should provide retailer app users with empowerment (for mandatory CP) and resources (for replaceable CP) to help them participate in the service production/delivery process successfully. To that end, hospitality firms need to develop and establish effective mechanisms for encouraging customers to engage in the two types of CP simultaneously. Interactive communication with customers might be helpful in that respect. The results should show managers how important mandatory CP is in increasing customers' store loyalty. Although it takes longer to improve store quality (e.g., educating employees about their attitudes and renovating the store environment), customers' simple participation in the two types of CP event can turn the two parties (firm and customer) into close friends rather than strangers. In this case, customers are less likely to blame the current low level of service quality on the firm (i.e., reducing the self-serving bias) but instead believe that the store will improve its service quality in the future.

6.3. Limitations and further research

Although this study offers important theoretical and managerial implications, there are some limitations. First, the present research operationalizes primary store registration and a store satisfaction survey as the mandatory and replaceable CP variables, respectively. However, CP can be tangible and/or intangible, involving for example people, objects, information, or preferences (Dong and Sivakumar, 2015). This study focuses on the case of intangible information (i.e., loyalty program registration and store satisfaction feedback). Future research needs to study how effective the two types of CP are in the case of tangible participation.

Second, the data collection of this study was undertaken in 2017 and restricted to two stores and their customers in South Korea. Hence, to increase the validity of the experiment results, the conceptual model needs to be tested with new experimental data collected from more hospitality stores in different countries. The extension of the data collection and analysis will provide strong evidence on the independent and interactional effects of various types of CP across different cultures and customer groups.

Third, because the percentage of customers who participated in either the mandatory or the replaceable CP events was very low (for both stores it was less than 2%), those participating customers might belong to an innovator or early adopter segment. Future research needs to collect new data with a higher rate of participating customers to examine whether ordinary customers behave differently after engaging in CP.

Finally, but not the least, the majority of hotel and restaurant customers believe that, in the time of the COVID-19 pandemic, the use of service technologies (e.g., robots, contactless payment, digital menus) can minimize human-to-human contact (Gursoy et al., 2020). Hence, it is important to collect up-to-date mobile app-driven CP and transaction data during the pandemic and identify whether in-app CP reduces hospitality customers' perceived threat of the pandemic but also makes customers patronize hotels or restaurants.

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Table 1. Sample characteristics

	Store A	Store B
Location	Residential area	Commercial area
Total customers	7,596	11,469
Age		
10s	45 (0.6%)	97 (0.9%)
20s	1,124 (14.8%)	3,067 (26.7%)
30s	3,402 (44.8%)	3,640 (31.7%)
40s	2,265 (29.8%)	2,705 (23.6%)
50s and above	760 (10%)	1,960 (17.1%)
Gender		
Male	1,540 (20.3%)	2,319 (20.3%)
Female	6,056 (79.7%)	9,150 (79.7%)
Membership level		
Pink	6,332 (83.4%)	8,909 (77.7%)
Gold	1,174 (15.5%)	2,357 (20.6%)
Platinum	90 (1.2%)	203 (1.8%)
Primary store registration		
Yes	50 (0.7%)	178 (1.6%)
No	7,546 (99.3%)	11,291 (98.4%)
Store satisfaction survey		
Yes	148 (1.9%)	175 (1.5%)
No	7,448 (98.1%)	11,294 (98.5%)

Table 2. Means of change in purchase behavior after removal of primary store registration event

Store A			
One-month change in purchase amount		One-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.15 (9.50)	5.77** (14.84)	-0.01 (0.71)	0.68** (1.65)
Two-month change in purchase amount		Two-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.51 (16.31)	11.47** (20.44)	-0.03 (0.71)	1.18** (2.49)
Store B			
One-month change in purchase amount		One-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.10 (8.26)	1.43* (9.00)	0.00 (0.73)	0.19 (1.73)
Two-month change in purchase amount		Two-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.16 (14.22)	4.78** (17.44)	-0.01 (1.34)	0.55** (3.11)

Note: Sample sizes of no participation (Store A), participation (Store A), no participation (store B), and participation (store B) are 7,546, 50, 11,291, and 178, respectively. Parentheses denote standard deviation.

** Significant at .05 level; * Significant at .10 level.

Table 3. Means of change in purchase behavior after removal of store satisfaction survey event

Store A			
One-month change in purchase amount		One-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.17 (9.42)	0.88 (14.88)	-0.01 (0.70)	0.06 (1.25)
Two-month change in purchase amount		Two-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.52 (16.10)	3.78 (25.99)	-0.03 (1.28)	0.23 (1.91)
Store B			
One-month change in purchase amount		One-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.16 (7.59)	-2.06 (27.76)	0.00 (0.75)	-0.05 (1.42)
Two-month change in purchase amount		Two-month change in purchase frequency	
No participation	Participation	No participation	Participation
0.28 (13.52)	-2.77 (39.77)	0.00 (1.36)	-0.02 (2.74)

Note: Sample sizes of no participation (Store A), participation (Store A), no participation (Store B), and participation (Store B) are 7,448, 148, 11,294, and 175, respectively. Parentheses denote standard deviation.

Table 4. Effects of customer participation on purchase behavior at Store A

Source	<i>df</i>	Mean Square	F
Model 1 (One-month change in purchase amount)			
Primary store registration (1)	1	1838.06	20.19**
Store satisfaction survey (2)	1	420.96	4.62**
(1) x (2)	1	416.17	4.57**
Age	1	89.73	0.99
Gender	1	59.18	0.65
Gold membership	1	225.38	2.48
Platinum membership	1	23.81	0.26
Error	7588	91.04	
Model 2 (One-month change in purchase frequency)			
Primary store registration (1)	1	36.52	71.38**
Store satisfaction survey (2)	1	11.89	23.25**
(1) x (2)	1	13.56	26.51**
Age	1	1.53	2.98*
Gender	1	0.39	0.76
Gold membership	1	4.55	8.90**
Platinum membership	1	2.12	4.14**
Error	7588	0.51	
Model 3 (Two-month change in purchase amount)			
Primary store registration (1)	1	3660.16	13.72**
Store satisfaction survey (2)	1	435.93	1.64
(1) x (2)	1	63.42	0.24
Age	1	231.41	0.87
Gender	1	1230.97	4.62**
Gold membership	1	0.01	0.00
Platinum membership	1	49.40	0.19
Error	7588	266.70	
Model 4 (Two-month change in purchase frequency)			
Primary store registration (1)	1	80.61	48.23**
Store satisfaction survey (2)	1	22.47	13.45**
(1) x (2)	1	17.44	10.44**
Age	1	7.06	4.23**
Gender	1	1.80	1.08
Gold membership	1	10.03	6.00**
Platinum membership	1	4.31	2.58
Error	7588	1.67	

** Significant at .05 level; * Significant at .10 level.

Table 5. Effects of customer participation on purchase behavior at Store B

Source	<i>df</i>	Mean Square	F
Model 5 (One-month change in purchase amount)			
Primary store registration (1)	1	1343.12	19,79**
Store satisfaction survey (2)	1	11.91	0.18
(1) x (2)	1	863.25	12.72**
Age	1	61.47	0.91
Gender	1	34.33	0.51
Gold membership	1	1.43	0.02
Platinum membership	1	5246.41	77.29**
Error	11461	67.88	
Model 6 (One-month change in purchase frequency)			
Primary store registration (1)	1	10.20	17.69**
Store satisfaction survey (2)	1	0.87	1.51
(1) x (2)	1	3.97	6.90**
Age	1	0.65	1.12
Gender	1	0.01	0.02
Gold membership	1	0.18	0.31
Platinum membership	1	2.91	5.04**
Error	11461	0.58	
Model 7 (Two-month change in purchase amount)			
Primary store registration (1)	1	2671.61	13.18**
Store satisfaction survey (2)	1	381.25	1.88
(1) x (2)	1	149.46	0.39
Age	1	854.23	4.22**
Gender	1	104.98	0.52
Gold membership	1	312.33	1.54
Platinum membership	1	11428.23	56.39**
Error	11461	202.68	
Model 8 (Two-month change in purchase frequency)			
Primary store registration (1)	1	22.87	11.89**
Store satisfaction survey (2)	1	0.28	0.15
(1) x (2)	1	0.02	0.01
Age	1	5.02	2.61
Gender	1	0.07	0.04
Gold membership	1	8.12	4.22**
Platinum membership	1	4.72	2.45
Error	11461	1.92	

** Significant at .05 level; * Significant at .10 level.

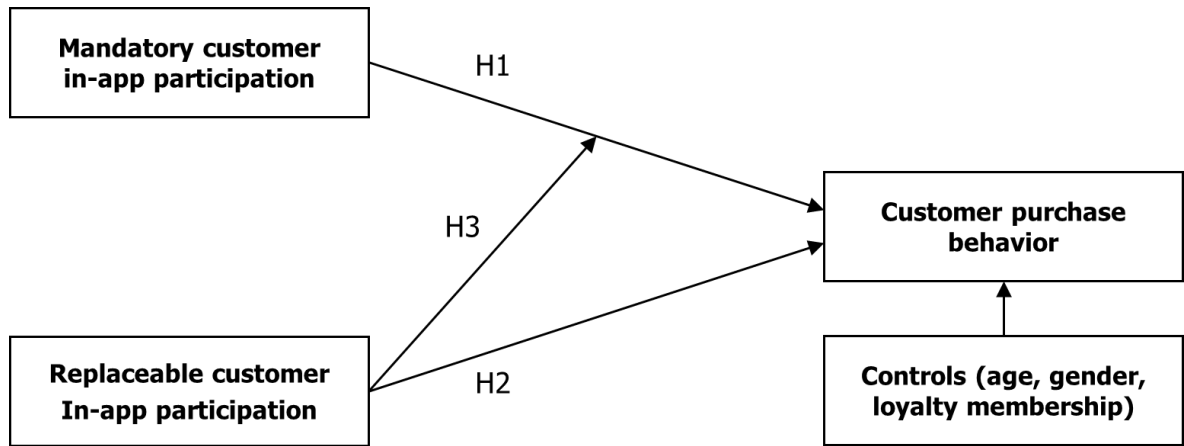
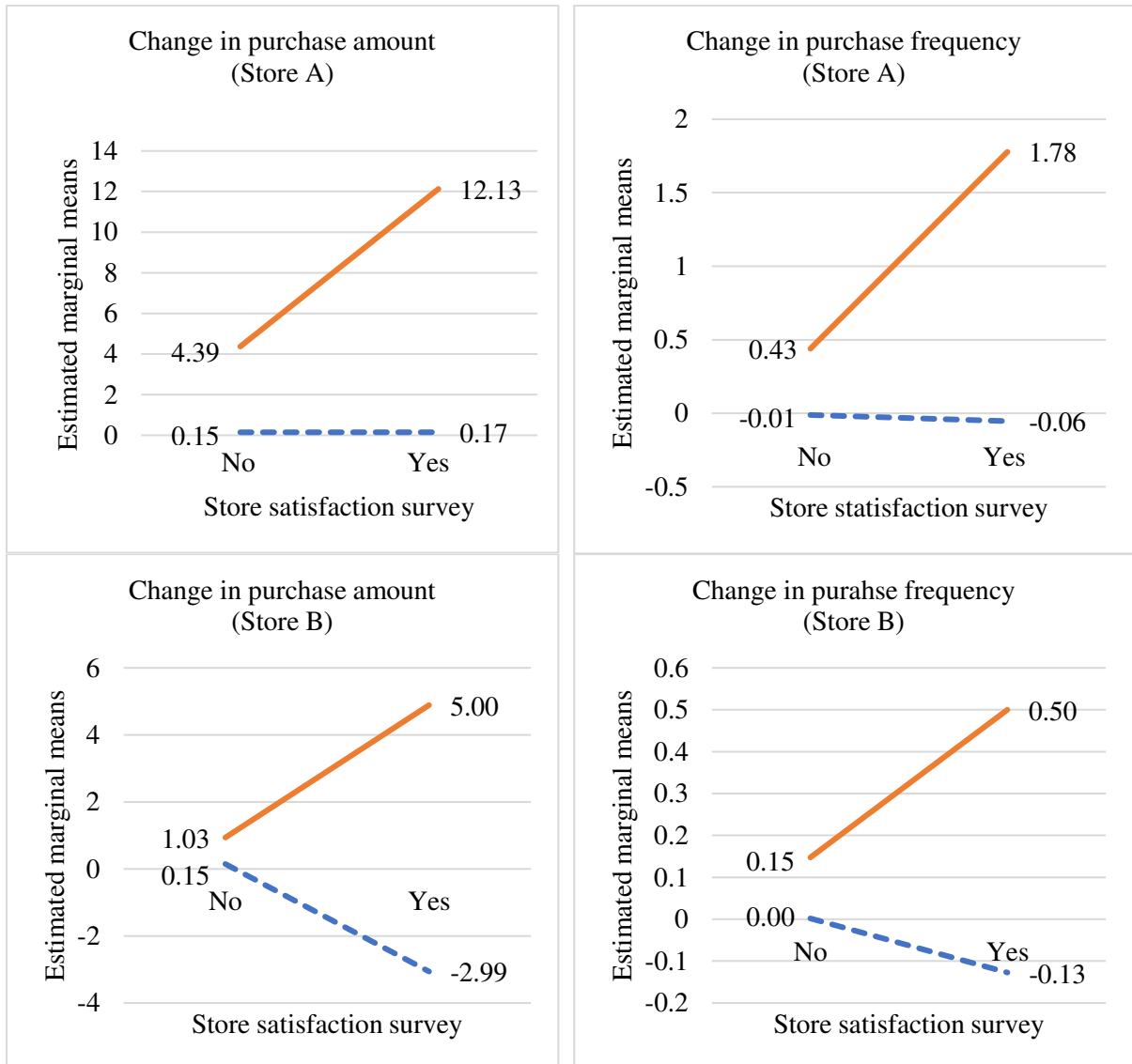


Figure 1. Conceptual model



Patron store registration
 — Yes
 - - - No

Figure 2. The interaction effect of presence of patron store registration and store satisfaction survey on change in one-month purchase behavior