Human baristas and robot baristas: How does brand experience affect brand satisfaction, brand attitude, brand attachment, and brand loyalty?

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A B S T R A C T

This study investigates the antecedents and consequences of brand satisfaction with the moderating role of type of barista. For this, data were collected from customers who used a coffee shop operated by robot baristas and customers who used a coffee shop operated by human baristas. The data analysis results showed that the four types of brand experience, such as sensory, affective, behavioral, and intellectual brand experiences, help to enhance brand satisfaction, which positively affects brand attitude, brand attachment, and brand loyalty. Finally, the type of barista plays a moderating role in the relationship between (1) sensory brand experience and brand satisfaction and (2) intellectual brand experience and brand satisfaction.

1. Introduction

People constantly visit coffee shops and statistics attest that the business performance of coffee shops continues to grow and prosper (Han et al., 2018; Jang, 2021). Franchise suppliers continuously open new stores and many independent operators enter the coffee shop industry due to low barriers to entry (Lee et al., 2018). As a result, a sizable portfolio regarding coffee shop brands is observed even in the midst of fierce competition. Even though the effects of the COVID-19 crisis have carried over into the coffee shop industry around the world, the global market of coffee shops is projected to continue its growth pattern and reach US$237.6 billion by 2025 (Research and Markets, 2020).

Today, experience carries a lot of weight in regard to consumers' consumption behavior (Hwang and Lee, 2018; Vanharanta et al., 2015). Practitioners in brand marketing consistently promote innovative ways to create an exceptional brand experience, which in turn strengthen the brand's beneficial relationships with consumers (Gilmore and Pine, 2007; Kim and Han, 2020). Brand experience is defined as "subjective consumer responses that are evoked by specific brand-related experiential attributes in such settings" (Brakus et al., 2009, p. 53). Hence, brand experience involves various moments during customers' consumption behavior, which includes how individuals perceive a brand's design and identity, servicescape, packaging, and much more. In this

respect, sensory, affective, behavioral, and intellectual facets have been proposed as the underlying dimensions of brand experience (Brakus et al., 2009). This multi-dimensional approach to brand experience has been widely adopted in academia in order to understand each stimulus of brand experience and its influence on consumer behavior (Chan and Tung, 2019; Zarantonello and Schmitt, 2010). Furthermore, many of these attempts indicate that brand experience, which is stored in consumers' memory, affects brand satisfaction (Han et al., 2019; Hwang and Hyun, 2012).

Loyal customers buy more items, bring in new customers, create a positive image, spread favorable word-of-mouth advertising, and are not easily enticed by offerings from competition (Han et al., 2018). Likewise, brand loyalty is a future-directed concept and is the key indicator of a firm's success in a severely competitive market. A considerable amount of effort has been focused on examining the critical antecedents of brand loyalty across different settings as a result (Hwang and Lee, 2018; Ko and Chiu, 2008; Rizvi et al., 2020). This stream of research has determined that the development of brand loyalty involves brand satisfaction (Lee et al., 2018; Lin, 2015), brand attitude (Bozbay et al., 2018; Kim et al., 2019), and brand attachment (Jang, 2021; Yu, 2020). In addition, Vanharanta et al. (2015) asserted that the holistic comprehension of the experiential aspect of customer contacts enables the ability to predict loyalty more accurately.

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Visiting a coffee shop goes beyond just the coffee (Waxman, 2006). A coffee shop in today's industry features a wide range of offerings that fulfill various purposes for visiting. Entrepreneurs in the coffee shop industry are constantly inventing new offerings, which are novel ways for service delivery to strengthen competitive power. Notably, the inclusion of innovative technology plays an important role in creating a unique brand experience. Out of the various attempts made by industry professionals to create a more compelling brand experience, robot baristas are the most remarkable (Sung and Jeon, 2020). There are many examples around the world, which include Briggo and Café X in the United States, Aabak in Australia, and Monty Café in Russia (Robotics Tomorrow, 2020). The franchise coffee shop chain Dal.komm in Korea introduced a robot barista called B:eat, which prepares coffee just like a human barista does (Sung and Jeon, 2020). There is no doubt that robot baristas are today's most advanced coffee shop solution. Conversely, employees are one of the most fundamental attributes in many hospitality settings (Chen et al., 2008; Hwang et al., 2016). In particular, service encounters amplify the impact of employee attributes. As such, Starbucks, which is the largest coffeehouse chain in the world, loves the charm of human-to-human interactions, and constantly invests resources in enhancing the attributes of the human baristas (Gulati et al., 2002).

The existing studies that pertain to coffee shops largely deal with customer satisfaction (Lee et al., 2018; Song et al., 2019). However, they do not provide enough evidence to address the development of brand loyalty, which is driven by brand experience at coffee shops powered by modern technology. Moreover, empirical evidence demonstrating the influence of robotics in coffee shops is rather rare. Specifically, the existing studies discuss the list of tasks that robots do better than humans and vice versa in other service sectors (e.g., Ivanov et al., 2020), but whether or not the application of robot baristas is beneficial for brand experience is not known. That is, the current literature limits our ability to understand the brand experience in a coffee shop setting in the light of advanced technology adoption and its effect in forming patronage intentions towards a specific brand. Thus, the aforementioned theoretical background and findings lead us to the following research questions of this study. (1) What influence do the underlying dimensions of brand experience in a coffee shop have on brand satisfaction? (2) Do the relationships among brand satisfaction, brand attitude, brand attachment, and brand loyalty exist in the coffee shop industry? (3) How does the effect of brand experience on brand satisfaction differ depending on the provision of services provided by human baristas and robot baristas? The rest of this paper is an endeavor to answer these outlined research questions and the findings, subject to D coffee brand which operates coffee shops with and without a robot barista. We believe our findings would contribute to advance our current knowledge and offer managerial implications for practitioners in the coffee industry.

2. Literature review

2.1. Application of robotics in hospitality

The world has witnessed how emerging technologies have transformed the way offerings are delivered to customers in hospitality. These advanced technologies include facial recognition, artificial intelligence, and most notably robotics which enables service automation (Ciftci et al., 2021; Ivanov et al., 2020; Tussyadiah, 2020). For example, Ivanov et al. (2017) introduced a set of current use and potential use of robots in various hospitality sectors which include restaurants and airports. Lin and Mattila (2021) explained how robots such as room service delivery robots, porter robots, and robot receptionists contribute to the value co-creation process of guest experience in the full service hotels. In the beverage industry, examples include an autonomous coffee shop and bar which is operated by a robot barista and virtual bartender where ordering, serving, and settling payments are managed without or with less human interactions (Tuomi et al., 2020). Moreover, studies in recent years have addressed more critical role of robotics in hospitality due to the health risk against the COVID-19 (Kim et al., 2021a, 2021b; Lin and Mattila, 2021).

2.2. Brand experience at a coffee shop

The core of a business has evolved to become experience-centered. Consumers enjoy brands that provide them with an exceptional experience (Zarantonello and Schmitt, 2010). For example, technology-powered gamification draws more attention to reinforce customer engagement in order to achieve a high level of brand loyalty in the tourism sector (Abou-Shouk and Soliman, 2021). Therefore, brands that offer enriched experiences generate more sales and more repeated engagement with their patrons. Likewise, entrepreneurs prioritize selling an extraordinary brand experience (Gilmore and Pine, 2007; Han et al., 2019), and companies promote a variety of experiences that result from diverse stimulations of individuals' senses and minds, in attempts to attract more consumers (Vanharanta et al., 2015). Specifically, practitioners keep abreast of changing technologies in the coffee shop industry (Han et al., 2018; Sung and Jeon, 2020). This modern setting of technology-powered coffeehouses adds value to the brand experience of a conventional coffee shop.

Visiting a coffee house involves not only its main product offering but also the experiential aspects it offers (Han et al., 2019). Brand experience is evoked by a variety of stimuli, which occur during customers' direct and indirect interactions with a brand (Schmitt, 1999). According to Brakus et al. (2009), brand experiences are categorized into sensory, affective, behavioral, and intellectual stimuli, based on the integration of findings from cognitive scientists, management, and philosophers. Sensory brand experience involves aesthetics, such as colors, shapes, designs, and the five senses (Brakus et al., 2009; Schmitt, 1999). In this regard, the view, adequate lighting, the aroma, the cleanliness, and comfortable furniture have been proposed as the most important features of a coffee shop (Waxman, 2006). Meanwhile, affective brand experience is related to emotions and sentiments through customers' overall experience with a brand (Brakus et al., 2009). In other words, it describes the emotional engagement between the brand and the consumer. The behavioral facet of brand experience indicates whether or not the brand experience encourages customers to engage in physical actions and behavior. Likewise, it includes completing tasks more effectively and making positive lifestyle changes (Hwang and Hyun, 2012), sharing thoughts with friends and family, and writing online reviews (Zarantonello and Schmitt, 2010). Intellectual brand experience refers to the ability of a brand to provide customers with convergent and imaginative thinking (Brakus et al., 2009; Zarantonello and Schmitt, 2010). Furthermore, it involves stimulating curiosity; intellectual brand experience therefore prevents customers from becoming bored (Han et al., 2019).

2.3. Effects of brand experience on brand satisfaction at a coffee shop

The achievement of the actual experience over the consumers' expectations results in satisfaction (Oliver, 1980). Following this logic of the expectancy-disconfirmation paradigm, brand satisfaction can be described as the outcome when individuals' affective and cognitive evaluation of the perceived brand performance exceeds the expected brand performance. Therefore, brand satisfaction depends on assessments of the consumption experience; studies are constantly demonstrating how brand experience affects brand satisfaction in the hospitality context (Brakus et al., 2009; Han et al., 2018).

Chinomona et al. (2013) surveyed South Africans who purchased consumer goods and their results determined that, when consumers have a positive brand experience, they are more likely to be satisfied with a brand. Lin (2015) explored the role of innovation in creating brand experience in the airline industry, confirming that brand experience exerted a positive influence on brand satisfaction. Lee et al. (2018)

determined that satisfaction in the coffee shop industry was developed by the atmosphere, the employees' attitudes, and the quality of the coffee. Specifically, a comfortable atmosphere was the most influential factor in determining how satisfied consumers felt. Han et al. (2019) adopted Brakus et al.'s (2009) conceptualization of brand experience, and acquired empirical evidence supporting the idea that brand experience at a coffeehouse significantly enhances satisfaction. Out of the four underlying dimensions, their results discovered the salient role of sensory experience in brand experience in the coffee shop sector. Hence, whether or not their experience at coffee shops meets customers' expectations determines their satisfaction or dissatisfaction, and the role of each facet of brand experience may differ in a modern coffee shop. These findings are summarized in the following hypotheses.

H1. : Sensory brand experience positively affects brand satisfaction.

H2. : Affective brand experience positively affects brand satisfaction.

H3. : Behavioral brand experience positively affects brand satisfaction.

H4. : Intellectual brand experience positively affects brand satisfaction.

2.4. Effects of brand satisfaction on brand attitude, brand attachment, and brand loyalty

Brand attitude results from brand attributes and their associated benefits (Park et al., 2010). On the other hand, brand attachment illustrates the magnitude of the bond connecting customers with a brand Thomson et al., 2005). Hence, brand attachment presents the motivational aspect and brand attachment refers to evaluative characteristics (Park et al., 2010; Rizvi et al., 2020).

The extant literature demonstrates that brand satisfaction usually leads to a favorable brand attitude (Bozbay et al., 2018), a stronger bond with a brand (Danniswara et al., 2020), and brand loyalty (Rizvi et al., 2020). Ko and Chiu (2008) examined how customer satisfaction with coffee chain stores is associated with brand attitude. They collected responses from university students, and their results showed that customer satisfaction affected cognitive, affective, and conative components of brand attitude. Han et al. (2018) explored the affective drivers of brand loyalty toward a coffee shop chain, and their findings indicated that experience driven by hedonic elements is of primary importance to the creation of brand satisfaction, which in turn influences relationship commitment and brand loyalty. Song et al. (2019) adopted the notion of satisfaction as the emotional response of a consumer's purchasing experience, and determined that brand loyalty is the outcome of satisfaction in the context of name-brand coffee shops. Accordingly, they suggested applying continuous efforts to creating an appealing total experience in order to increase the level of customer satisfaction. Danniswara et al. (2020) studied the consequences of brand satisfaction with social networking sites, and their results depicted brand attachment and behavioral intentions as outcomes of their analysis. Thus, the following hypotheses are proposed.

H5. : Brand satisfaction positively affects brand attitude.

H6. : Brand satisfaction positively affects brand attachment.

H7. : Brand satisfaction positively affects brand loyalty.

2.5. Effects of brand attitude on brand attachment and brand loyalty

Brand attitude is defined as a summary evaluation of a brand that presumably energizes behavior (Spears and Singh, 2004). The current body of literature supports the idea that brand attitude is a prerequisite of brand attachment and brand loyalty. For example, Rajumesh (2014) explored how brand loyalty is formulated in association with the brand experience of soft drink beverage brands. The analysis results, based on 232 valid responses, revealed the close relationship between brand

attitude and brand loyalty. Furthermore, the results indicated that brand attitude played a strong mediating role in the association between brand experience and brand loyalty. Bozbay et al. (2018) investigated students' loyalty formation, observing that brand attitude exerted a significant influence on word-of-mouth intention and brand loyalty. Kim et al. (2019) examined the role of tourists' brand attitude toward their shopping experience. Their analysis of a survey involving 742 Chinese tourists revealed that brand attitude generated customers' preferences and positive intentions toward a specific brand. Yu (2020) articulated the growing importance of nature-based solutions in the hotel context, determining how customers' attitudes toward a hotel's green spaces strengthened brand-self connections. As a result, the following hypotheses are proposed, which are in line with these findings.

H8. : Brand attitude positively affects brand attachment.

H9. : Brand attitude positively affects brand loyalty.

2.6. Effects of brand attachment on brand loyalty

Companies with many loyal customers enjoy more revenue and an increased market share, and earn higher returns on their investments (Han et al., 2018). This is because brand loyalty is associated with the commitment to repeatedly purchase offerings from the same brand over time, promote the brand to others, and decline to switch to another brand (Song et al., 2019). Hence, scholars have endeavored to explore the core driving forces of brand loyalty and brand attachment, which are often validated as key factors (Hwang and Lee, 2018). That is, a strong cognitive and affective bond between a consumer and a brand induces customers' positive intentions toward a certain brand (Yu, 2020). Existing studies also support this argument, based on empirical evidence. For instance, Hwang and Lee (2018) explained that brand attachment is embodied by customers' experiences and memories of a brand; they reported that brand attachment plays an important role in the development of positive behavioral intentions. Jang (2021) tested the role of a green atmosphere in coffee shops. The analysis results confirmed that customers form a strong emotional bond with the green servicescape of coffee shops, and this type of attachment significantly increases loyalty. As such, the following hypothesis is proposed.

H10. : Brand attachment positively affects brand loyalty.

2.7. Comparison of human-human interactions and robot-human interactions

It is not an infrequent occurrence today for people to be served by robots. Robotic service delivery enhances customer experience in various respects, such as in terms of efficiency and entertainment (Sung and Jeon, 2020). Likewise, a number of studies have investigated customers' perceptions toward robots, evidencing positive perceptions in the hotel sector (Kim and Han, 2020) and in restaurant settings (Hwang et al., 2020). For instance, Chan and Tung (2019) investigated the effects of robotic services on guests' evaluations of brand experience in the hotel context. Their results indicated that the customers appreciated a relatively high degree of sensory and intellectual brand experience from robotic services, but they indicated a relatively low level of affective experience, which is no exception in the coffeehouses. Sung and Jeon (2020) confirmed that customers exhibit positive perceptions, which include usefulness, enjoyment, and innovativeness, in regard to robotics in a coffee shop. Hence, many entrepreneurs believe that robotics are indispensable in regard to meeting the needs of modern consumers in today's marketplace (Kim and Han, 2020). More recently, studies examined how customers perceive services offered by robots in comparison to the services provided by humans during COVID-19 (e.g. Henkel et al., 2020; Kim et al., 2021a, 2021b), and their findings discovered more positive responses to the robot service.

In the meantime, there are rising concerns over less human contact in

the service sector. For instance, Ivanov et al. (2020) explained how robots are employed for various tasks in today's hospitality industry and they studied perceptions towards robot services from hotel operators' perspective. Their findings indicated the needs of different task allocation between human and robot, and they claimed that human employees are more valuable for tasks that involve social skills and emotional intelligence. Moreover, human-to-human interactions have long been a characteristic of hospitality, employee attributes have therefore been widely examined as an important asset of a company. As such, human employees' expertise, responsiveness, customer orientation, and likeability are often discussed in order to create a distinctive brand experience (Chen et al., 2008; Hwang et al., 2016).

On the basis of the rising presence of robotics in the service sector, academic efforts have recently increased in this field order to understand the differences between human-human interactions and robot-human interactions (Leo and Huh, 2020; Mende et al., 2019). Choi et al. (2020) examined how customers perceive service quality depending on the service provided by human employees and service robots. Their study revealed that customers display more positive perceptions regarding interaction quality and physical service environment when they receive services from human employees. The merits of human-to-human service encounters were further examined in a study conducted by Shin and Jeong (2020). Their analysis results showed that, even though customers exhibit favorable attitudes toward service robots, they prefer human-to-human interactions that are genuine and sincere. The studies conversely emphasize the cognitive and analytical skills of robots, which provide an excellent cup of coffee according to precise algorithms that can recommend the coffee beans that best meet customers' preferences (de Berardinis et al., 2020). These findings imply that the link between brand experience and brand satisfaction varies between human-human interactions and robot-human interactions. Thus, the above discussions were the main drivers underlying the hypotheses below.

H11a. : The relationship between sensory brand experience and brand satisfaction is significantly moderated by a robot barista and a human barista.

H11b. : The relationship between affective brand experience and

brand satisfaction is significantly moderated by a robot barista and a human barista.

H11c. : The relationship between behavioral brand experience and brand satisfaction is significantly moderated by a robot barista and a human barista.

H11d. : The relationship between intellectual brand experience and brand satisfaction is significantly moderated by a robot barista and a human barista.

Fig. 1 depicts the theoretical framework of this study, which involves a total of 10 hypotheses regarding the causal relationships among the eight latent constructs and the moderating effects of the type of employee.

3. Methodology

3.1. Measurement

In order to assess the proposed model, the measurement items of each construct were developed based on multiple-item measurement scales used in prior research. First, the four sub-dimensions of brand experience were measured using the 12 items in Brakus et al. (2009) and Hwang and Hyun (2012). Brand satisfaction was measured using three items that were developed by Hennig-Thurau et al. (2002) and Hwang et al. (2016). Brand attitude was measured using three items that were adapted from Hwang and Hyun (2017) and Mitchell and Olson (1981). Brand attachment was measured using three items from Carroll and Ahuvia (2006) and Hwang and Lee (2019). Finally, brand loyalty was measured using three items that were developed by Hwang and Park (2018) and Zeithaml et al. (1996). The variables of our study are all reflectively measured. In addition, all the items mentioned above were measured using a seven-point Likert scale ranging from one (strongly disagree) to seven (strongly agree).

3.2. Data collection

This study conducted two separate surveys in order to verify how
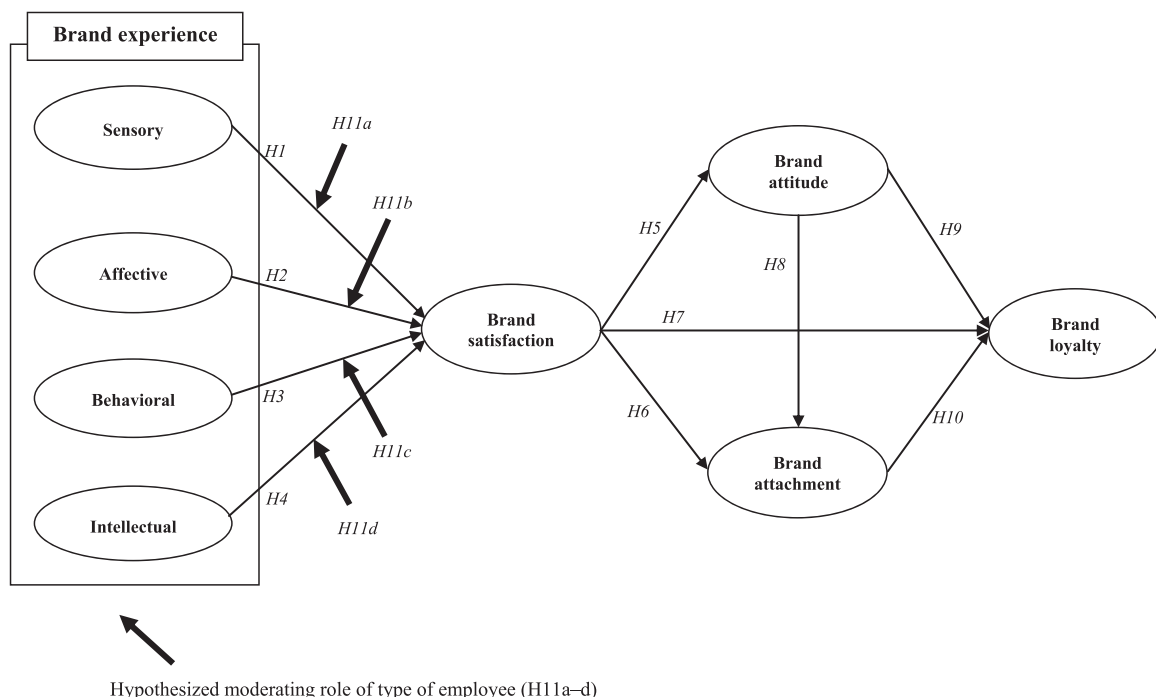

Fig. 1. Proposed conceptual model.

brand experience affects brand satisfaction differently based on the type of employee, which included robots and humans for three weeks in October 2020. In order to collect data from a coffee shop where robots provide services (which hereinafter will be referred to as CR) and a coffee shop where humans provide services (which hereinafter will be referred to as CH), the current study selected the D coffee brand in South Korea, because the brand operates two types of coffee shops, as shown in the Appendix. Moreover, there are more than 70,000 coffee shops in South Korea where adult people drink over 300 cups of coffee compared to the international average of 132 cups a year (SeoulZ, 2021). First, in terms of CR, there are no employees in the coffee shop, and a robot barista makes coffee according to the customers' orders; the orders are placed at a store, which takes the form of a booth, and the robot barista then provides coffee for the customers. The customers can place orders through a smartphone app before they arrive at the store, to reduce their wait times. The robot barista has the ability to make up to 90 cups of coffee per hour and 14 cups at the same time. Second, in the case of CH, which is a regular coffee shop where customers order coffee from employees, the customers receive the coffee directly and drink their coffee at tables.

In order to conduct a survey of the customers who use the two types of coffee shops described above, M Company, which is one of the largest survey companies in Korea, was used. The company trained 10 interviewers about precautions they should take when conducting the survey in order to ensure accurate results. A small number of CRs are currently in operation in South Korea, which causes a very low response rate, so we decided to collect data using face-to-face surveys as a non-probability sampling technique. In addition, a separate survey was conducted in order to secure enough CR customers. They waited at the door of each coffee shop and collected data by conducting face-to-face surveys with the customers who used the coffee shop. The interviewers fully explained the purpose of the study to the respondents before the survey began.

First, in regard to CR, 339 patrons responded to the survey. In addition, five responses were removed as a result of a visual inspection and a Mahalanobis distance check, so 334 responses were employed for further statistical analysis. Second, in regard to CH, of the 365 questionnaires that were collected, 352 were used for the data analyses after ruling out 13 responses as the result of performing a visual inspection and a Mahalanobis distance check. Lastly, in order to test the issue of common method variance (CMV), this study performed a Harmon one-factor test, and the result indicated less than the recommended threshold of 50% (Podsakoff et al., 2012). This study employed descriptive statistics in order to identify the demographic characteristics of respondents. In addition, confirmatory factor analysis (hereafter which hereinafter will be referred to as CFA) was used to examine the reliability and validity of the measurement items, and structural equation modeling (hereafter which hereinafter will be referred to as SEM) was used to verify the proposed hypotheses. In previous studies, such as Hair et al. (2006) and Weston and Gore's (2006) indicated that more than 200 samples will be adequate in conducting CFA and SEM with the maximum likelihood estimation method.

4. Data analysis

4.1. Descriptive statistics

Table 1 presents the profile of the survey respondents. In regard to CR, 41% of the respondents ($n = 137$) are male and 59% ($n = 197$) are female. In addition, 37.1% of the respondents were in their 20 s ($n = 124$), followed by respondents in their 30 s ($n = 97$, 29.0%). The majority of the respondents hold a bachelor's degree ($n = 206$, 61.7%). In regard to marital status, 171 (51.2%) were single and 160 (47.9%) were married. Finally, the majority of the respondents ($n = 84$, 25.1%) earned between 5001$ US and 6000$ US.

In regard to CH, 143 (40.6%) are male and 209 (59.4%) are female.

Table 1
Profile of survey respondents.

Variable	A coffee shop where robots provide services ($n = 334$)	A coffee shop where humans provide services ($n = 352$)	Merging two data ($n = 686$)
Gender			
Male	137 (41.0%)	143 (40.6%)	280 (40.8%)
Female	197 (59.0%)	209 (59.4%)	406 (59.2%)
Age			
20s	124 (37.1%)	123 (35.0%)	247 (36.0%)
30s	97 (29.0%)	111 (31.5%)	208 (30.3%)
40s	58 (17.4%)	60 (17.0%)	118 (17.2%)
50s	47 (14.1%)	48 (13.6%)	95 (13.8%)
60s	8 (2.4%)	10 (2.8%)	18 (2.6%)
Average age (Std. deviation)	35.53 (11.55)	35.99 (10.59)	35.77 (11.06)
Education level			
Less than High school diploma	40 (12.0%)	22 (9.1%)	72 (10.5%)
Associate's degree	73 (21.9%)	44 (12.5%)	117 (17.1%)
Bachelor's degree	206 (61.7%)	223 (63.4%)	429 (62.5%)
Graduate degree	15 (4.5%)	53 (15.1%)	68 (9.9%)
Marital status			
Single	171 (51.2%)	185 (52.6%)	356 (51.9%)
Married	160 (47.9%)	165 (46.9%)	325 (47.4%)
Others	3 (0.9%)	2 (0.6%)	5 (0.7%)
Income level			
8001$ US and over	29 (8.7%)	74 (21.0%)	103 (15.0%)
7001$ US - 8000$ US	27 (8.1%)	25 (7.1%)	52 (7.6%)
6001$ US - 7000$ US	43 (12.9%)	43 (12.2%)	86 (12.5%)
5001$ US - 6000$ US	84 (25.1%)	44 (12.5%)	128 (18.7%)
4001$ US - 5000$ US	62 (18.6%)	44 (12.5%)	106 (15.5%)
3001$ US - 4000$ US	50 (15.0%)	47 (13.4%)	97 (14.1%)
2001$ US - 3000$ US	27 (8.1%)	53 (15.1%)	80 (11.7%)
Under 2000$ US	12 (3.6%)	22 (6.3%)	34 (5.0%)

In terms of age, 35.0% of the respondents were in their 20 s ($n = 123$), followed by respondents in their 30 s ($n = 111$, 31.5%). Additionally, the majority of the respondents ($n = 222$, 63.4%) were college graduates. In regard to marital status, 185 (52.6%) were single and 165 (46.9%) were married. Finally, 21.1% of the respondents ($n = 74$) were earning 8001$ US and above.

4.2. Confirmatory factor analysis

Table 2 illustrates the results of the CFA of the three models, which included CR and CH. Merging the two forms of data, which hereinafter will be referred to as MTD, illustrated that they all have a suitable model fit (CR: $\chi^2 = 455.692$, df = 224, χ^2/df = 2.034, $p < .001$, NFI =0.951, CFI =0.974, TLI =0.968, and RMSEA =0.056; CH: $\chi^2 = 458.668$, df = 224, χ^2/df = 2.048, $p < .001$, NFI =0.950, CFI =0.974, TLI =0.967, and RMSEA =0.055; and MTD: $\chi^2 = 573.301$, df = 224, χ^2/df = 2.559, $p < .001$, NFI =0.971, CFI =0.982, TLI =0.978, and RMSEA =0.048) (Hair et al., 2020). Additionally, the data analysis showed that the values of the factor loadings were equal to or greater than.830 for the CR model,.798 for the CH model, and.844 for the MTD model.

Table 3 shows descriptive statistics and associated measures. The average value of all constructs exceeded 4, showing that people responded more agreeable, and the values of SD ranged from.88 to 1.23, suggesting that the values are more closely near the mean. The average variance extracted (AVE) values of the three models are greater than.50,

Table 2
Confirmatory factor analysis: Items and loadings.

Construct and Scale Item (Skewness and Kurtosis)	Standardized Loading[a]		
	CR	CH	MTD
Brand experience			
Sensory			
This coffee brand makes a strong impression on my visual sense. (−0.470 and −0.370)	.882	.870	.897
I found this coffee brand interesting in a sensory way. (−0.485 and −0.374)	.911	.919	.931
This coffee brand stimulates my senses. (−0.562 and −0.100)	.909	.892	.916
Affective			
This coffee brand induces feeling and sentiments in me. (−0.342 and −0.528)	.908	.891	.912
I have strong emotions to this coffee brand. (−0.286 and −0.602)	.931	.836	.886
This coffee brand is an emotional brand. (−0.325 and −0.297)	.918	.860	.895
Behavioral			
When I have coffee at this coffee brand, I feel active and energetic. (−0.090 and −0.641)	.935	.877	.906
After I have coffee at this coffee brand, I think I can work tasks more effectively. (−0.222 and −0.439)	.919	.873	.904
When I'm reminded of this coffee brand, I feel lively. (−0.383 and −0.124)	.911	.897	.916
Intellectual			
I engage in a lot of thinking when I encounter this coffee brand. (−0.379 and −0.051)	.875	.849	.871
When I think about this coffee brand, I'm reminded of how it succeeds with its creative strategies. (−0.425 and −0.147)	.931	.943	.945
This coffee brand stimulates my curiosity and problem solving. (−0.576 and.206)	.886	.931	.921
Brand satisfaction			
I am satisfied with this coffee brand. (−0.445 and −0.097)	.874	.837	.874
I am happy with this coffee brand. (−0.377 and −0.462)	.830	.927	.935
I am delighted with this coffee brand. (−0.483 and −0.272)	.941	.923	.941
Brand attitude Attitude toward using this brand…			
Unfavorable–Favorable (−0.556 and −0.497)	.848	.873	.873
Negative–Positive (−0.672 and −0.725)	.945	.924	.941
Bad–Good (−0.662 and −0.502)	.937	.915	.931
Brand attachment			
I love using this coffee brand. (−0.345 and −0.273)	.907	.864	.894
I am passionate about this coffee brand. (−0.594 and.511)	.905	.839	.889
I would feel sorry if this coffee brand ceased its operations. (−0.359 and −0.420)	.856	.798	.844
Brand loyalty			
I say positive things about this coffee brand to others. (−0.149 and −0.750)	.887	.890	.909
I would like to use this coffee brand more often. (−0.243 and −0.830)	.916	.834	.887
I would like to use this coffee brand in the future. (−0.313 and −0.663)	.927	.870	.906

Goodness-of-fit statistics

CR: $\chi^2 = 455.692$, df = 224, $\chi^2/df = 2.034$, $p < .001$, NFI = 0.951, CFI = 0.974, TLI = 0.968, and RMSEA = 0.056

CH: $\chi^2 = 458.688$, df = 224, $\chi^2/df = 2.048$, $p < .001$, NFI = 0.950, CFI = 0.974, TLI = 0.967, and RMSEA = 0.055

MTD: $\chi^2 = 573.301$, df = 224, $\chi^2/df = 2.559$, $p < .001$, NFI = 0.971, CFI = 0.982, TLI = 0.978, and RMSEA = 0.048

Notes 1: CR = A coffee shop where robots provide services, CH = A coffee shop where humans provide services, and MTD = Merging two data

Notes 2: [a] All factors loadings are significant at $p < .001$

Notes 3: NFI = normed fit index, IFI = incremental fit index, CFI = comparative fit index, TLI = Tucker-Lewis index, and RMSEA = root mean square error of approximation

Notes 4: The value of standard error of Skewness was.133 while the value of standard error of Kurtosis was.266.

which supports high levels of convergent validity (Hair et al., 2020). In addition, all of the values of the composite reliabilities are higher than.70, which shows high levels of internal consistency (Manley et al., 2020). Finally, all of the values of the AVE are higher than the values of the squared correlations (R^2) between any pair of constructs, which supports high levels of discriminant validity (Bagozzi and Yi, 1988).

4.3. Structural modeling

A SEM analysis was performed in order to identify the 10 hypotheses, which are shown in Fig. 2. The results of the SEM indicated an adequate fit of the model to the data ($\chi^2 = 695.396$, df = 236, $\chi^2/df = 2.947$, $p < .001$, NFI =0.964, CFI =0.976, TLI =0.972, and RMSEA =0.053). In addition, all the hypotheses were statistically supported at $p < .05$. Specifically, sensory ($\beta = 0.286$ and $t = 5.706*$), affective ($\beta = 0.338$ and $t = 4.801*$), behavioral ($\beta = 0.199$ and $t = 3.247*$), and intellectual ($\beta = 0.123$ and $t = 3.126*$) stimuli were found to increase brand satisfaction; hence, Hypotheses 1, 2, 3, and 4 were supported. Additionally, brand satisfaction enhances brand attitude ($\beta = 0.199$ and $t = 3.247*$), brand attachment ($\beta = 0.199$ and $t = 3.247*$), and brand loyalty ($\beta = 0.199$ and $t = 3.247*$). Memorable brand experience also has a positive influence on brand attitude ($\beta = 0.769$ and $t = 21.726*$), brand preference ($\beta = 0.779$ and $t = 16.701*$), and brand loyalty ($\beta = 0.150$ and $t = 2.664*$). Therefore, Hypotheses 5, 6, and 7 were supported. Brand attitude positively affects brand attachment ($\beta = 0.122$ and $t = 2.974*$) and brand loyalty ($\beta = 0.125$ and $t = 3.611*$), so Hypotheses 8 and 9 were supported. Finally, there is a positive relationship between brand attachment and brand loyalty ($\beta = 0.696$ and $t = 12.280*$).

4.4. Measurement-invariance assessment

The current study conducted a measurement invariance assessment (Steenkamp and Baumgartner, 1998). The two groups are composed of CR ($n = 334$) and CH ($n = 352$). As shown in Table 4, the non-restricted model and the full-metric invariance model had satisfactory fit statistics. Furthermore, the difference between the two models was not significant ($\Delta\chi^2 = 32.439 < \chi^2 =.01(df =24) = 32.439$), which suggested that the full metric invariance was statistically supported.

4.5. Multiple-group analysis

In order to check the moderating role of the type of employee, which included robots and humans, the current study used a multiple-group analysis, as shown in Table 4. To check the differential effects of the type of employee, the chi-square (χ^2) difference between the constrained and the unconstrained models was examined in regard to the difference in the degrees of freedom (Anderson and Gerbing, 1988). The data analysis results revealed that the type of employee plays a moderating role in the relationship between (1) sensory experience and brand satisfaction ($\Delta\chi^2 = 5.216 > \chi^2 =.5(1) = 3.84$, and df = 1) and (2) intellectual experience and brand satisfaction ($\Delta\chi^2 = 4.201 > \chi^2 =.5(1) = 3.84$, and df = 1). Thus, Hypotheses 11a and 11d were supported. More specifically, in terms of the relationship between sensory experience and brand satisfaction, the path coefficient for the CR group ($\beta = .290$ and $t = 4.666*$) was greater than the path coefficient for the CH group ($\beta = .014$ and $t = 0.126$). In addition, in regard to the relationship between intellectual experience and brand satisfaction, the path coefficient for the CR group ($\beta = .201$ and $t = 3.405*$) was greater than the path coefficient for the CH group ($\beta = .033$ and $t = 0.547$). However, there is no moderating role of the type of employee in the relationship between (1) affective experience and brand satisfaction ($\Delta\chi^2 = 1.632 < \chi^2 =.5(1) = 3.84$, and df = 1) or that between (2) behavioral experience and brand satisfaction ($\Delta\chi^2 = 2.518 < \chi^2 =.5(1) = 3.84$, and df = 1). Thus, Hypotheses 11b and 11c were not supported. Table 5.

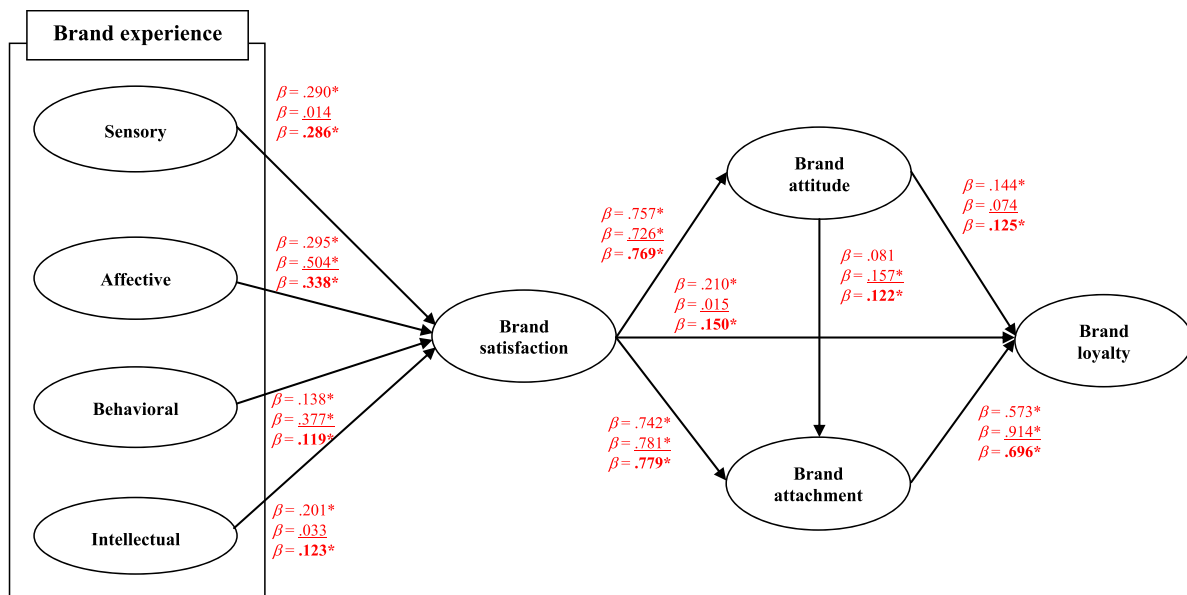**Table 3**

Descriptive statistics and associated measures.

	Mean (Std dev.)	AVE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Sensory	5.65 (1.01)	.811	.928	.767[a]	.655	.632	.717	.607	.646	.576
	4.68 (1.07)	.799	.923	.716	.769	.733	.798	.626	.817	.763
	5.15 (1.15)	**.837**	**.939**	**.754**	**.789**	**.733**	**.800**	**.672**	**.788**	**.742**
(2) Affective	5.55 (1.07)	.845	.588[b]	.942	.821	.720	.746	.689	.753	.681
	4.93 (0.97)	.744	.513	.897	.719	.714	.752	.713	.767	.727
	5.23 (1.04)	**.806**	**.569**	**.926**	**.783**	**.746**	**.821**	**.724**	**.829**	**.784**
(3) Behavioral	5.35 (1.05)	.850	.429	.674	.944	.722	.687	.656	.683	.635
	4.72 (1.03)	.779	.591	.517	.913	.799	.750	.673	.756	.804
	5.03 (1.09)	**.826**	**.623**	**.613**	**.934**	**.785**	**.794**	**.693**	**.794**	**.755**
(4) Intellectual	5.13 (1.18)	.806	.399	.518	.521	.926	.678	.554	.665	.575
	4.32 (1.23)	.826	.537	.510	.638	.934	.693	.701	.758	.726
	4.71 (1.27)	**.833**	**.537**	**.557**	**.616**	**.937**	**.726**	**.572**	**.722**	**.641**
(5) Brand satisfaction	5.78 (0.90)	.838	.514	.557	.472	.460	.939	.778	.768	.764
	5.01 (0.96)	.804	.637	.566	.563	.480	.925	.490	.694	.580
	5.39 (1.01)	**.841**	**.640**	**.674**	**.630**	**.527**	**.941**	**.749**	**.845**	**.833**
(6) Brand attitude	6.07 (0.89)	.830	.368	.475	.430	.307	.605	.936	.642	.672
	5.37 (1.13)	.818	.392	.508	.453	.491	.240	.931	.723	.725
	5.71 (1.07)	**.838**	**.452**	**.524**	**.480**	**.327**	**.561**	**.939**	**.721**	**.742**
(7) Brand attachment	5.56 (0.98)	.791	.417	.567	.466	.442	.590	.412	.919	.834
	4.80 (0.98)	.696	.667	.588	.572	.575	.482	.523	.873	.754
	5.17 (1.05)	**.767**	**.621**	**.687**	**.630**	**.521**	**.714**	**.520**	**.908**	**.817**
(8) Brand loyalty	5.73 (0.88)	.828	.332	.464	.403	.331	.584	.452	.696	.935
	4.93 (0.91)	.748	.582	.529	.646	.527	.336	.526	.569	.899
	5.32 (0.98)	**.811**	**.551**	**.615**	**.570**	**.411**	**.694**	**.551**	**.667**	**.928**

Notes 1: The unmarked values are for a coffee shop where robots provide services; The underlined values are for a coffee shop where humans provide services; and Values in boldface type are for merging two data

Notes 2: AVE = Average Variance Extracted

Notes 3: Shades. composite reliabilities are along the diagonal

Notes 4. a. correlations are above the diagonal and b. squared correlations are below the diagonal

Fig. 2. Structural model results.

Table 4

Measurement-invariance models.

	Models	χ^2	df	NFI	CFI	TLI	RMSEA	$\Delta\chi^2$	Full-metric invariance
Type of employee (i.e. CR and CH)	Non-restricted model	914.382	448	.950	.974	.968	.039	$\Delta\chi^2$ (24) = 32.439	Supported
	Full-metric invariance	946.821	472	.947	.972	.967	.040	$p > .01$ (insignificant)	

Notes 1: NFI = Normed Fit Index, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, and RMSEA = Root Mean Square Error of Approximation

Notes 2: $\Delta\chi^2$ (24) = 42.980 and $p > .01$

Table 5
Moderating role of the type of employee.

Path	Unconstrained model				Constrained model	Tests of moderator	
	A coffee shop where robots provide services		A coffee shop where humans provide services		$\Delta\chi^2$ (472) = 1055.918	χ^2 difference	Hypotheses
	β	t-value	β	t-value			
H11a S → BS	.290	4.666*	.014	.126[ns]	$\Delta\chi^2$ (473) = 1061.134	$_\Delta\chi^2(1)$ = 5.216	Supported
H11b A → BS	.295	3.415*	.504	3.101*	$\Delta\chi^2$ (473) = 1057.55	$_\Delta\chi^2(1)$ = 1.632	Not supported
H11c B → BS	.138	1.894[ns]	.377	2.791*	$\Delta\chi^2$ (473) = 1058.436	$_\Delta\chi^2(1)$ = 2.518	Not supported
H11d I → BS	.201	3.405*	.033	.547[ns]	$\Delta\chi^2$ (473) = 1060.119	$_\Delta\chi^2(1)$ = 4.201	Supported

Notes 1: S = Sensory, A = Affective, B = Behavioral, I = Intellectual, and BS = Brand satisfaction
Notes 2: [ns] = not significant
Notes 3: * $p < .05$
Notes 4: $_\Delta\chi^2(1)$ = 3.84 and $p < .05$

5. Discussion

This study provides empirical results regarding brand experience, brand satisfaction, brand attitude, brand attachment, and brand loyalty in a coffee shop. In addition, the moderating effect of the type of barista, which included human baristas and robot baristas, on the relationship between brand experience and brand satisfaction was explored. The results are explained and discussed in regard to the following. First, one of the key aspects of this study is the examination of the antecedents of brand satisfaction. In this study, the four sub-dimensions of brand experience, which included sensory experience, affective experience, behavioral experience, and intellectual experience, were measured, and they were found to be significant factors that affect brand satisfaction in a coffee shop. These results are in line with the results of previous studies, which reported that consumers are more likely to be satisfied when they have a positive brand experience regarding the goods and service products in question (Chinomona et al., 2013; Lin, 2015). It is obvious that sensory, affective, behavioral, and intellectual aspects of brand experiences should be taken into account in order to enhance consumers' brand satisfaction with a coffee shop.

Second, this research examined the consequences of brand satisfaction, which included brand attitude, brand attachment, and brand loyalty. According to the results, brand satisfaction positively affected brand attitude, brand attachment, and brand loyalty. When consumers' affective and cognitive evaluation of the perceived brand performance exceeds the expected brand performance, they are more likely to evaluate the overall coffee brand very favorably, love using the coffee brand, and are likely to use that coffee brand more often in the future. These findings are similar to the results from the previous literature, which found positive associations among brand satisfaction, brand attitude, brand attachment, and brand loyalty (Bozbay et al., 2018; Danniswara et al., 2020). This study also confirms that brand attitude, brand attachment, and brand loyalty are critical outcome variables of brand satisfaction in a coffee shop.

Third, the results indicated that brand attitude positively affected brand attachment and brand loyalty. Once consumers formulate a positive brand attitude toward a coffee brand, they become passionate about the coffee brand and would like to use that coffee brand in the future. Previous studies also confirmed that brand attitude is a prerequisite of brand attachment and brand loyalty (Kim et al., 2019; Yu, 2020). The findings of the current study show the important role of brand attitude in regard to brand attachment and brand loyalty. This result is meaningful, because it confirms that brand attitude is distinct from brand attachment (Yu, 2020). Furthermore, it is less likely that consumers will formulate brand attachment within a short period of time. Therefore, it may take time to create brand attachment among consumers, and brand attitude is a critical antecedent of brand attachment.

Fourth, it is evident that a high level of brand attachment leads to a high level of brand loyalty in a coffee shop. Consumers who love using a coffee brand and have a strong connection with that coffee brand are more likely to be loyal customers who will say positive things about the coffee brand to their families and friends; they will also use the coffee brand more often than any others. This result is similar to those of previous studies, which have explained that brand attachment plays an important role in developing positive behavioral intentions, such as repurchasing goods or service products (Hwang and Lee, 2018; Jang, 2021).

Fifth, the type of barista, which includes human baristas and robot baristas, plays a moderating role in the link between sensory experience and brand satisfaction. The findings indicate that consumers who experienced more sensory stimuli are more likely to be satisfied with the coffee brand when they visit CR than CH. Previous studies have compared consumers' different perceptions between service robots and human service providers in diverse contexts (Chan and Tung, 2020; de Berardinis et al., 2020; Leo and Huh, 2020). For example, Choi et al. (2020) confirmed that customers perceive different service qualities depending on the service provided by human employees and robots. Leo and Huh found that people attribute less responsibility toward the service robots than human service providers under the service failure situation. According to Mende et al. (2019), people showed lower evaluation when food was served by a humanoid service robot rather than by a human server. However, previous studies have not focused on how sensory experience in a hospitality setting can lead to brand satisfaction depending on a different type of service provider. Thus, this study provides new information to the hospitality industry, particularly coffee shop practitioners.

Sixth, it was found that consumers who perceived a higher level of intellectual brand experience are more likely to be satisfied with the coffee brand when they visit CR than CH. This result is somewhat similar to the findings suggested by Chan and Tung (2020). They noted that customers perceived a higher level of intellectual brand experience of robot hotels than regular hotels. However, they did not empirically compare the structural relationship of intellectual brand experience and brand satisfaction between the groups who experienced robotic services and human services. Hwang et al. (2020) found that cognitively motivated consumer innovativeness leads to a positive impression of robotic restaurants. That is, when consumers think that robotic restaurants make them consider the various aspects of robotic restaurants and make them think logically, they created a more positive image of robotic restaurants. However, in their study, comparison of intellectual aspects of consumer perception between robotic restaurants and traditional restaurants were not further examined. To sum up, the current study proved that consumers have different brand experience perceptions and satisfaction levels when they are served by different types of baristas, which include human baristas and robot baristas, in a coffee shop.

Last, the current study shows that affective brand experience positively influenced brand satisfaction for both CR and CH. That is, the moderating effect of affective brand experience on brand satisfaction was not significant. It is worth mentioning that this result could be different if this study was conducted in a coffee shop where a humanoid robot barista provides service to customers. A humanoid robot refers to a

robot that is very similar to humans in terms of appearance (Mende et al., 2019). Mende et al. (2019) measured diverse responses from consumers with different scenarios through laboratory experiments. Their study showed that consumers expressed a negative affective response (e.g. discomfort) when they imagined receiving food service provided by humanoid robot than by a human server. Previous studies also indicate that consumers tend to show negative feelings when they encounter humanoid robots, while people show more acceptance when it comes to animated featured robots (Yu, 2020). Therefore, future studies can be conducted to find out how consumers' affective brand experience differs depending on different types of robots which include humanoid robots and other types of robots.

6. Implications

6.1. Theoretical implications

There are theoretical contributions in this research. First, the current study successfully examined the essential role of brand experience in the formation of brand satisfaction in a coffee shop. In particular, this study examined consumers' coffee brand experiences using a multidimensional approach. Previous studies classified brand experience into sensory, affective, behavioral, and intellectual stimuli (Brakus et al., 2009) and the current study proves that the four sub-dimensions of brand experience effectively represent consumers' brand experience in a coffee shop. Since nowadays customers visit a coffee shop not only to simply consume coffee but also to have positive brand experience that the coffee shop offers, brand experience management is certainly an important issue in the coffee shop industry. However, understanding multiple dimensional brand experiences in the context of coffee shop is still lacking in the field of hospitality. Particularly, there are few studies that investigated antecedents and consequences of brand satisfaction of a coffee shop from customer perspective and compared their different perceptions between human baristas and robot baristas. The current study filled this void and adds significant values to the existing hospitality and tourism literature.

Second, the relationships among conceptual model constructs indicated that brand satisfaction had a significant influence on brand attitude, brand attachment and brand loyalty. There were also positive relationships among brand attitude, brand attachment and brand loyalty. That is, our empirical research found the significant role of antecedents of brand loyalty in the context of coffee shops within the conceptual model. A number of previous hospitality and tourism studies confirmed the positive relationship between attitude and loyalty (Bozbay et al., 2018; Kim et al., 2019). However, sometimes the findings were not consistent. For example, Yu (2020) explored the effect of green spaces on the traveler loyalty process in a hotel and found that the relationship between attitude and loyalty was not significant. Different from this, the current study provides the coffee industry and practitioners essential information that the brand loyalty process is eventually traced back to customers' positive brand experiences in a coffee shop which is connected by a serial of important variables (brand satisfaction, brand attitude, and brand attachment) within the proposed theoretical framework.

Third, our research demonstrated the moderating effect of type of baristas on the relationship between brand experience and brand satisfaction in a coffee shop. As far we know, this is a first attempt that explored how the influence of brand experience on brand satisfaction is different depending on the type of barista, which included human baristas and robot baristas. Utilizing different types of baristas as moderators is of significant importance in generating positive brand satisfaction in a coffee shop. Previous studies noted that customers perceived different brand experience between robotic hotels and traditional hotels (e.g. Chan and Tung, 2019). However, in their study, an empirical comparison of the structural relationship from the brand experience to the brand satisfaction was not investigated. The current study adopted

multi-group analysis which broadens the range of studies regarding the moderating role of the type of employee when consumers use hospitality industry establishment. Therefore, this current research provides insights for researchers considering different types of service medium that involve robotics as a moderating variable in the field of hospitality.

6.2. Practical implications

First, coffee industry practitioners should focus on enhancing consumers' sensory brand experience in order to increase the level of brand satisfaction. It is important to make a strong impression on consumers' five senses. For example, some coffee shops roast raw coffee beans themselves in order to provide fresh coffee for consumers and to appeal to consumers' olfactory senses. Meanwhile, consumers overall are fond of the delicate aroma that is generated from the process of making coffee. Therefore, coffee industry practitioners should think of ways to maintain a pleasant aroma, which can be appealing to the consumers, in coffee shops. In order to stimulate consumers' sense of taste, various coffee menus should be developed. It is necessary to provide tailored services to customers who have their own preferences in terms of taste. For example, if consumers can choose the proportion of sourness, sweetness, and bitterness of a brand of coffee, they can be greatly satisfied in terms of their sense of taste. In addition, in order to stimulate customers' sensory brand experience, it is recommended that a small coffee card or coffee sleeves are provided when there is an opportunity to promote or explain a new brand of coffee to customers. That small coffee card may show not only information about the new coffee product, but also provide particular features or the history of the coffee brand with a specially designed logo as well. The coffee card may contain a coffee scent, which is similar to perfume, and the card material could be a tactile stimulus for consumers.

Second, the advertising phrases or promotional materials used by a coffee brand should have an affective appeal to consumers. It should be noted that an affective brand experience is the second most significant contributor that affects brand satisfaction. Coffee industry practitioners can emphasize the ways in which a coffee brand induces positive feelings in consumers and try to make the consumers consider the coffee brand as an emotional brand to them.

The importance of emotional responses in hospitality industry establishments has been well documented in previous studies (Magnini and Parker, 2009). Researchers have indicated that emotional responses to the physical environment can be transmitted to consumers (Magnini and Parker, 2009). For example, the background music at a coffee shop can influence this transfer. On the other hand, some scholars have mentioned that emotions are socially extended and shared by others (Krueger and Szanto, 2016). Wood and Kinnunen (2020) explored how emotionally rich collective experiences create good memories in a festival context; they found that the sociality of the experience is a key aspect of the emotional responses. In this regard, coffee industry practitioners should consider focusing on the sociality of coffee consumption in order to increase the affective brand experience. However, the demand for contactless services has recently sharply increased due to the outbreak of COVID-19, so having less human contact and decreasing the sociality of coffee consumption may generate positive emotions between the coffee brand and consumers at present. Hence, more market research needs to be conducted in order to find out how to increase affective brand experience.

Third, in order to increase the behavioral brand experience, it is important to make the consumers feel active, energetic, and involved when they experience the coffee. Baristas can make a drip brew right in front of the customers, so they can engage in the coffee making process. Customers can also engage in very simple tasks, such as holding the cup so that the barista can pour the coffee more stably after the coffee is made. If the consumers are involved in the coffee manufacturing process, they will feel more active and energetic in regard to the process. The consumers can also be invited to write their new-year wishes on a

card and hang the card on a coffee tree in a coffee shop. These types of engagement could play an important role in enhancing consumers' behavioral brand experience.

Fourth, this study found that intellectual brand experience plays an important role in increasing brand satisfaction. Drinking coffee can stimulate consumers' curiosity and problem-solving skills. For example, Terarosa, which is one of the most popular coffee brands in South Korea, encourages customers to visit their coffee museum first before they enter the coffee shop. Therefore, the customers can learn about the history of coffee, the types of coffee available, and the roasting methods used. Customers can also taste various types of coffee for free and learn what types of coffee might fit into their lifestyles (Pine city, 2017). This is a good example of how a coffee shop can provide an intellectual brand experience for consumers. Therefore, coffee industry practitioners should think of ways to stimulate the intellectual brand experience of their customers. For example, they may decorate the entrance of their coffee shops in order to provide a unique experience that can be used as intellectual stimuli for customers.

Fifth, based on the findings of this study, it is recommended that coffee industry practitioners who have adopted or plan to utilize robot baristas emphasize the sensory and intellectual brand experience involved, rather than the affective and behavioral brand experience. This will be more effective in terms of enhancing brand satisfaction. There are not many coffee shops that use robot baristas at the moment, so their existence itself seems to directly stimulate consumers' senses. First of all, their visual appearance is totally different from that of human baristas. Therefore, they may have a stronger effect on the creation of a unique brand experience for consumers. Moreover, ordering coffee from robot baristas may stimulate consumers' curiosity and cause them to think due to the novelty of the robot baristas.

Sixth, it was found that consumers do not necessarily experience strong behavioral brand experience when they are served by robot baristas. This is understandable, because after the robot baristas have taken their orders, the customers may not experience lively or energetic engagement with robots but will instead passively wait for their coffee. Therefore, it may not be effective for coffee industry practitioners who have adopted robot baristas or have plans to use them in the future to emphasize behavioral brand experience very much.

To conclude, customers have different brand experience that affects brand satisfaction depending on different type of barista in a coffee shop. Many coffee shops nowadays have adopted coffee baristas or have plans to utilize robots in their service process to strengthen competitive power

(Robotics Tomorrow, 2020). However, coffee shop owners and practitioners should be reminded that hiring a robot barista as an employee can generate different consequences which might not be the same from their expectation. High-technology coffee shops (e.g. robot barista) and high-touch coffee shops (e.g. human barista) may provide distinctive brand experience to customers and this cannot be overlooked by coffee industry practitioners.

7. Limitations and future research

Even though the current study has important theoretical and practical implications, which are discussed above, it also has the following limitations. First, the data were collected from Korea in order to evaluate the research model in this study. However, due to the large cultural differences regarding technology-based services (Kim and Han, 2020), it is necessary to collect data from other regions in future research. Second, the results of this study should be carefully applied to the hospitality industry, which includes hotels and restaurants, because this study focused on robot services in the coffee industry specifically. Third, it is widely accepted that demographic factors, such as gender, age, and income level, have an important effect on consumer behavior in the context of new technology-based services (e.g. Henkel et al., 2020; Hwang and Kim, 2019; Hwang et al., 2019), so it is necessary to identify its role as a moderating or control variable in future research. Fourth, it may be interesting to classify the service process (production x delivery) and the service medium (human barista x robot barista) in a coffee shop and investigate which combination is preferred by consumers in the future study. For example, consumers might prefer a coffee made by a human but delivered by a robot. Fifth, previous studies (e.g. Jang, 2021; Lee et al., 2018) suggested that physical environments are a significant factor affecting loyalty in the coffee industry, so future research is necessary to see the role of the physical environment in comparing between CR and CH. Sixth, since the brand experience may vary depending on how long customers stay at a coffee shop, it is necessary to control time factors in future studies. Lastly, data from this study were collected during the COVID-19 pandemic. Since the COVID-19 pandemic is an important factor in making consumers prefer non-face-to-face services, such as robot baristas (Kim et al., 2021a, 2021b), consumers' preferences may change after the COVID-19 pandemic. For this reason, it is required to collect data after the COVID-19 pandemic and compare CR and CH.

Appendix The two types of coffee shop
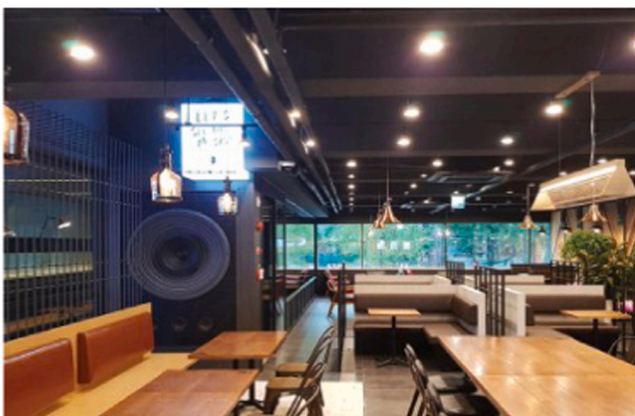
Source: dal.komm (2021).

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