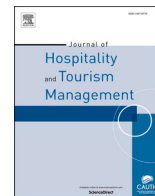




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The antecedents and consequences of memorable brand experience: Human baristas versus robot baristas

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ABSTRACT

This study was designed to examine the antecedents and consequences of the memorable brand experience in the coffee industry. The study collected data from 335 people who used a coffee shop in which robots provided services and from 351 people who used a coffee shop in which people provided services. The study's results indicated that two types of perceived values – utilitarian values and hedonic values – helped in the formation of a memorable brand experience. In addition, it was found that a memorable brand experience had a positive influence on customers' brand attitude and brand preference, and in turn, the brand attitude and brand preference positively affected the customers' brand loyalty. Finally, the type of employee played a moderating role in the relationships between (1) utilitarian value and a memorable brand experience and (2) hedonic value and a memorable brand experience.

1. Introduction

Entrepreneurs in the hospitality industry constantly strive to gain a competitive advantage in their offerings in order to create memorable experiences that cultivate brand loyalty (Hwang & Lee, 2018). With various efforts, the application of robotics enables service automation, which creates experiences that are differentiated from the ones using human-to-human interactions in service encounters (Kim, Choe, & Hwang, 2020; Mende et al., 2019). Specifically, the use of robots in a service encounter creates a new experience that many more consumers in our modern day might appreciate and prefer. That is, embracing cutting-edge technology provides innovative solutions that can set a brand above the competition, and the field of robotics is the main driving force for such innovation in many diverse service settings (Buhalis et al., 2019; Ivanov et al., 2019). Moreover, following the COVID-19 outbreak, the use of robots in service encounters has drawn considerable attention because robots can help people observe physical distancing in public spaces (Kim, Kim, & Hwang, 2020).

In the coffee industry, robot baristas are regarded as an outstanding disruptive technology (Sung & Jeon, 2020). Café X is a popular robot coffee chain that features an automated barista bot that can fill more than 10 orders simultaneously within minutes (Blum, 2019). Similarly,

robot baristas in Briggo Coffee Houses provide the perfect cup of gourmet espresso for time-sensitive travelers at airports across the United States (Holley, 2019). In Korea, dal. komm envisioned a robot café in 2017 and now aims to establish 300 futuristic cafés within a couple of years (dal.komm, 2021). Indeed, robot baristas have moved beyond the novelty stage and soon will be a part of our everyday lives. However, the extant literature contains very limited findings on how consumers perceive robot baristas.

The provision of memorable brand experiences is vital in the service sector (Khan & Fatma, 2017). Researchers have continually conducted studies to identify the antecedents of brand experience, and perceived value was validated as one of the fundamental influencing factors (Hwang & Lee, 2018; Moon & Han, 2019). In the meantime, Klaus and Maklan (2013) emphasized functional and emotional cues in the creation of a customer experience. Likewise, numerous scholars have explored perceived value from utilitarian and hedonic perspectives (Babin et al., 1994; Tang et al., 2018). To be specific, researchers have studied both utilitarian value, which is based on functional aspects, and hedonic value, which is centered on emotional aspects, as essential determinants of consumer responses related to a brand, including brand experience. In particular, customers are now more empowered than ever before in value creation in the service sector, and thus they play an

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important role in the process of cocreating a brand experience (Pralhad & Ramaswamy, 2003). Toward that end, the application of robotics in service operations encompasses a wide range of benefits from both the operators' perspective and that of the customers, involving incremental value which promotes a unique customer experience (Belanche et al., 2020; Webster & Ivanov, 2020). On the other hand, Starbucks, which is the largest international coffee house, with more than 20,000 locations worldwide, loves the charm of its human baristas and has no official plans to adopt robot baristas (Hochman, 2020).

To date, research endeavors in academia pertaining to coffee shops have mainly dealt with traditional human-to-human interactions (Chen & Hu, 2010; Han et al., 2018; Kim, Choi, & Hyun, 2020; Wang & Yu, 2016). Furthermore, researchers have made few attempts to understand how customers evaluate the value of a coffee shop that is specialized with advanced technologies. As a result, little is known about how the use of robots in a coffee shop creates a memorable brand experience and further enhances brand relationships. Hence, this study addresses the urgent need for a more comprehensive understanding about the causal relationship between perceived value and memorable brand experience, as determined by the type of employee – in this case, robots versus humans. In addition, prior studies have provided sufficient evidence that brand experience induces customers to develop a positive brand attitude, brand preference, and brand loyalty in diverse contexts (Chang & Chieng, 2006; Overby & Lee, 2006). Nonetheless, it is difficult to find empirical studies that have investigated such associations in coffee shops differentiated by the use of robots in their delivery of products and services. Therefore, this study is motivated by the following three research questions in the coffee shop setting:

RQ1. How does perceived value contribute to create memorable brand experience?

RQ2. What effect does memorable brand experience have on the development of brand loyalty?

RQ3. Does the type of employee play a moderating role in the relationship between perceived value and a memorable brand experience?

The present study, unlike previous studies, focused on the modern setting of a coffee shop and endeavored to (1) identify the antecedents and effects of the use of robotics on brand experience and brand loyalty, and (2) provide empirical evidence to differentiated value that the use of robots enables in their delivery of products and services. This outlines the overall purpose of this paper which is to investigate the use of robotics in providing memorable brand experience and developing brand loyalty, as determined by the type of employee (i.e., robots vs. humans). The findings would fill the gaps in the extant literature where scant evidence exists to support different customer responses depending on the type of employee in a coffee shop sector. Consequently, this study would contribute to a better understanding of brand experience in developing patronage and offer relevant implications for the coffee industry.

2. Literature review

In the following section, we introduce the disruptive role of innovative technologies in hospitality. Then, we discuss the perceived value as an essential antecedent of memorable brand experience and brand-related variables affected by memorable brand experience. Last, we will explain the potential moderating effects of the type of employee. These discussions based on the existing literature will outline the conceptual research model and hypotheses of this study.

2.1. Disruptive role of innovative technologies in hospitality

Failure to adapt to change and innovate will ultimately result in a lag in competition (Pralhad & Ramaswamy, 2003). Nowadays, technology

plays a vital role in how providers innovate to keep up with demands to serve more complex and sophisticated consumer needs. To be concrete, service automation is sweeping the hospitality industry as many entrepreneurs seek ways not only to minimize labor costs and improve productivity, but also to respond to the needs of today's consumers (Buhalis et al., 2019; Ivanov et al., 2019). Specifically, Naumov (2019, pp. 123–133) articulated the implementation of robots, artificial intelligence, and service automation in hospitality and the author introduced various technologies which include mobile applications and robot concierges. Furthermore, the author determined the effect of these innovative technologies on customers' perception of service quality and their experience. Digital technologies which include a wide set of technologies such as big data, Blockchain, and Internet of Things also drive operational changes or even organizational changes to some extent (Ardito et al., 2019; Evangelista et al., 2020). Likewise, D'Ippolito et al. (2019) discussed how digital technologies affect the dynamics of business model innovation. The stream of these studies commonly indicates how technologies contribute to create incremental value in customer experience.

2.2. Perceived value

Consumer behavior involves dynamic interactions and exchanges and thus is better predicted when perceived value is deeply analyzed. The trade-off definition of perceived value by Zeithaml (1988) is the most universally accepted one, and perceived value has been studied with a single-item scale as well as a multidimensional construct. The single-item approach of perceived value has mainly focused on the amount of value enjoyed for the money spent, which centers on the cognitive and practical functions (e.g., Han et al., 2018). However, consumers engage with multiple perceptions of value, and many scholars have argued that perceived value should be treated as a multidimensional concept (Kim, Choi, & Hyun, 2020; Wang & Yu, 2016).

Studies in consumer behavior literature have proposed several types of value perceptions. Sheth et al. (1991) suggested five sub-dimensions of perceived value of consumer goods: functional value, social value, emotional value, epistemic value, and conditional value. Sheth and colleagues conceptualized these underlying dimensions along with the perceived utility acquired from an alternative, and defined functional value as utilitarian or physical performance, social value as associations with one or more specific social groups, emotional value as aroused feelings or affective states, epistemic value as a novelty or the satisfaction of a desire for knowledge, and conditional value as a specific situation or set of circumstances. According to Babin et al. (1994), perceived value in a product and/or service purchase can be categorized as a utilitarian value and a hedonic value. Utilitarian value is task-focused and involves the effectiveness and efficiency of a consumption or buying process, whereas hedonic value refers to emotional benefits, including arousal, excitement, fun, and pleasure (Overby & Lee, 2006). Specifically, utilitarian value encompasses customers' perception of functional outcomes of product- or service-related attributes in the purchasing experience. Thus, functional benefits, such as saving time or money, along with comfort and convenience, are often described in the utilitarian perspective. In contrast, numerous scholars have articulated that hedonic value represents emotional aspects, such as the fun and joy associated with consumption of a product or service (Kim, Choi, & Hyun, 2020). Meanwhile, Sweeney and Soutar (2001) proposed an emotional dimension, a functional dimension, and a social dimension in assessing the perceived value of durable goods. In their study, social value was articulated as "the utility derived from the product's ability to enhance social self-concept" (Sweeney & Soutar, 2001, p. 211).

Researchers have adopted such multidimensional approaches frequently in the context of the coffee industry (Oh et al., 2019; Tang et al., 2018). For example, Chen and Hu (2010) categorized symbolic value, which originates in emotional appraisal, and functional value,

which is primarily formed by quality, as the salient types of perceived value in the Australian coffee industry, and they examined empirically how those values were associated with customer loyalty. Wang and Yu (2016) explored the association between perceived value and repurchase intention of ready-to-drink coffee, and found that utilitarian value was a more crucial determinant of repurchase intention than hedonic value was. Oh et al. (2019) illustrated that perceived value at coffee franchises consisted of service quality, which involved product, employee service, and physical environment quality, and experience quality, which dealt with hedonics, peace of mind, and recognition. Similarly, Kim, Choi, & Hyun, 2020 determined that utilitarian value in a coffee house comprised convenience, taste, prompt service, and variety. On the other hand, the sensory attributes of coffee houses, such as the visual environment, the mood, and background music, are often involved in forming the hedonic value of a coffee shop (Kim, Choi, & Hyun, 2020; Wang & Yu, 2016). Following those findings from background research and empirical evidence in the literature, the current study was founded on a multidimensional approach (i.e., on utilitarian value and hedonic value) in a coffee shop context.

2.3. Effects of perceived value on a memorable brand experience

A memorable experience is defined as an experience that is well retained and recalled afterward and therefore can be considered to be the main source of individuals' decision making regarding whether to revisit a venue (Kim et al., 2012). Meanwhile, a brand experience refers to individuals' internal and subjective responses, such as their cognition, feelings, and sensations evoked by brand-related stimuli (Iglesias et al., 2011). Integrating these conceptualizations, Hwang and Lee (2018) described a memorable brand experience as a rich brand experience that is sustainable over time.

Many kinds of offerings and interactions can foster the customer experience, and the customer's experience with a specific brand is formed by both functional and emotional cues (Klaus & Maklan, 2013). That is, a memorable brand experience is built by consumers' perceived value, which varies across different sectors depending on the fundamental attributes of the products and services. For example, Hwang and Lee (2018) articulated that a memorable brand experience of golf tournament spectators consisted of various factors, including the excellence of food and beverage quality and the flawlessness of services, the convenience of accessibility for a golf sport event, the employee service attributes, and pleasant sensory cues. The authors then successfully identified the close link between the perceived value of core products or services and a memorable brand experience. In the nature-based tourism context, Kim and Thapa (2018) investigated whether perceived value was associated with flow experience, which refers to a state in which people are very involved in an activity. That empirical study, using 300 responses from international tourists who participated in an ecotourism tour package, provided evidence that quality value, emotional value, and social value influenced the formation of flow experience. Similarly, Moon and Han (2019) tested how tourists' perceived value, based on enjoyment, escapism, involvement, and relaxation, created customers' unique experiences in the field of island tourism. The stream of these studies implies that the individuals' perceived value from specific products or service attributes facilitates the customers' memorable brand experience. Hence, it can be said that consumers' perceptions of the utilitarian value and the hedonic value of a coffee shop will contribute to the creation of a memorable brand experience. Thus, we hypothesized that:

H1. Utilitarian value significantly promotes a memorable brand experience.

H2. Hedonic value significantly promotes a memorable brand experience.

2.4. Effects of a memorable brand experience on brand attitude, brand preference, and brand loyalty

The existing research indicates that developing an individual's strong brand loyalty is one of the best ways to build a firm's success in the current competitive marketplace (Han et al., 2018; Iglesias et al., 2011). Brand loyalty is explained as a durable commitment to the same brand, leading to customer behavior that is dedicated to repeatedly purchasing the same product or service in the future. Thus, brand loyalty is crucial in the brand equity process, which retains more customers with lower marketing costs (Aaker, 1991). Likewise, many studies have contributed to the concepts related to a brand, such as brand attitude, brand preference, and brand loyalty, and scholars have explored their effects and interrelationships (Chinomona et al., 2013; Oliver, 1999).

Considerable evidence in various contexts supports the significant impact of brand experience on brand attitude, brand preference, and brand loyalty. For example, Fam et al. (2013) reported that brand experience with technology-powered products had a direct effect on brand attitude. Rajumesh (2014) tested the relationships among brand experience, brand attitude, and brand loyalty in the consumer goods category, and the result of that analysis revealed that brand experience was positively and significantly associated with brand attitude as well as with brand loyalty. Regarding the impact of a memorable brand experience on brand preference, Chinomona et al. (2013) found that brand preference resulted from a positive brand experience in the context of nondurable consumer goods. In a similar vein, Hwang and Lee (2018) determined that a memorable brand experience resulted in consumers having stronger intentions to revisit the specific place to which they had brand loyalty. Also, Kim and Thapa (2018) determined that tourists' flow experience influenced the formation of their destination loyalty. Khan and Fatma (2019) examined the association between brand experience and brand loyalty using qualitative and quantitative procedures, and their findings supported the notion that a memorable brand experience attracts customers toward that brand, which leads to loyalty toward the brand. In summary, individuals who have a lasting memory of their brand experience develop a positive attitude, preference, and loyalty for that brand. On the basis of this evidence, we posited that:

H3. A memorable brand experience significantly promotes brand attitude.

H4. A memorable brand experience significantly promotes brand preference.

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

Brand attitude refers to an attitude that an individual reveals toward a certain brand with which he or she interacts (De Chernatony & Riley, 1998). Individuals who have a strong brand attitude tend to resist trying products or services from other brands, and thus they exhibit preference and loyalty to that particular brand (Fam et al., 2013; Kudeshia & Kumar, 2017). Rajumesh (2014) postulated that brand attitude is a mediator in the relationship between brand experience and brand loyalty, and that study's data analyses, based on 232 samples, supported the hypothesis. Kudeshia and Kumar (2017) conducted a survey-based empirical study, and their results discovered that brand attitude and purchase intention for brands were significantly associated with each other. Other studies also found the significant role of brand attitude in the coffee chain context. For instance, Kang et al. (2011) analyzed 389 responses from customers of brand coffee shops and found that a positive attitude toward a store fostered a high intention to repurchase from that store. Song et al. (2019) asserted that attitude toward a brand, and particularly the consumer's emotional state, were central to the individuals' brand choice in a name-brand coffee shop. Oh et al. (2019) explored the service experience at coffee franchises, and they showed how brand attitude was associated with brand loyalty. Given this background information, we hypothesized that:

H5. Brand attitude significantly promotes brand preference.

H6. Brand attitude significantly promotes brand loyalty.

2.6. Effects of brand preference on brand loyalty

Brand preference is described as a sum of brand assets and liabilities that link to a customer's intangible and subjective assessment of the brand (Aaker, 1991). Meanwhile, brand loyalty is often illustrated as a commitment to revisit one's preferred shops or patronize favorable products or services consistently in the future (Oliver, 1999). Prior research found brand preference to be a fundamental predictor of customers' selection of products or services, and that in turn indicates the level of brand loyalty across the different hospitality settings. Specifically, Overby and Lee (2006) examined the relationship between brand preference and brand loyalty using 817 responses collected in an online retail context and found that brand preference was driven by utilitarian shopping value and strongly affected the formation of brand loyalty. Chinomona et al.'s (2013) study demonstrated that a strong bond between consumers with high brand preference and brand loyalty exists in the retailing industry. Similar results were found in the context of the coffee industry (Kang et al., 2011; Pleshko & Heiens, 2019). As an example, Wróblewski and Mokrysz (2018) investigated consumer preferences for brands of coffee in Poland and demonstrated how those preferences were linked to the consumers' choice of coffee brands. Following all of that supporting evidence, we posited that:

H7. Brand preference significantly promotes brand loyalty.

2.7. Moderating effects of the type of employee

Service automation through advances in innovative technology provides patrons with an unforgettable brand experience. Several studies have determined that customers enjoy technology-powered service encounters as being more convenient and efficient than less-technology-driven services (Webster & Ivanov, 2020), which indicates that if customers evaluate the attributes of robotics positively, they will experience memorable moments through their technical options. However, there is also a creeping sense that robotics might not be a perfect solution because human beings are able to refine their taste during the process of dialing in the flavor, and consumers often still require warm hospitality (Hochman, 2020; Holley, 2019). Likewise, Naumov (2019, pp. 123–133) observed the difficulty to find the appropriate balance between technology and human interactions since the ever-growing importance to gain a competitive edge through embracing technologies and provision of more tailor-made service for unique customer experience remains controversial. More specifically, the author explained that the focus has shifted from process which relies on attention to detail and personal touch, to product which emphasizes efficiency, reliability, and speed of service through the embracing technologies in hospitality.

In the service setting, Biedenbach and Marell (2010) have shown brand experience to form largely through the interactions between service providers (i.e., employees) and customers. That is, employees who are on the front line play a critical role in developing brand identity, and thus they exert an important influence on the customers' brand experience. In that regard, many studies have determined how people perceived human-robot interactions and assessed the service quality in their hospitality (Belanche et al., 2020; Choi et al., 2019), thus identifying the differences between the customer experience with robots and that with human employees. Those studies have not necessarily explained what type of employee performs better, but there are apparently pros and cons with each. For instance, the high degree of human appearance amplifies customers' emotional attachment, whereas the proactivity of robots increases visibility and attracts more customers (Belanche et al., 2020). The stream of these studies addressing customer experiences is likely to differ depending on the employees with which

the customers are interacting (i.e., robot or human). In addition, past studies have made few attempts to compare customer experience and/or customer service evaluations that considered the type of employees (again, robots and humans). For example, Mende et al. (2019) conducted a series of experiments in the context of restaurant services, and they revealed that individuals exhibited more compensatory responses when they interacted with robots than when they interacted with human employees. This evidence implies that the type of employee – robot or human – would moderate the association between perceived value and memorable brand experience in the coffee shops. Thus, the present study posited the following sub-hypotheses.

H8a. The link between utilitarian value and a memorable brand experience is significantly moderated by the type of employee.

H8b. The link between hedonic value and a memorable brand experience is significantly moderated by the type of employee.

Thus, our theoretical framework involved a total of nine hypotheses encompassing the causal relationships among six latent constructs and the moderating role of the type of employee (see Fig. 1).

3. Methodology

3.1. Measurement items

In order to measure the six constructs in the proposed model, this study used multiple-item measurement scales whose reliability and validity were verified in prior studies. First, values consisted of two subdimensions – utilitarian values and hedonic values – and they were measured using six items cited from Babin et al. (1994) and Ryu et al. (2010). Second, memorable brand experience was measured using three items employed by Hwang and Lee (2018) and Stokburger-Sauer and Teichmann (2013). Third, brand attitude was measured with three items adapted from Hwang and Hyun (2017) and Mitchell and Olson (1981). Fourth, brand preference was measured using three items taken from Hellier et al. (2003) and Hwang and Han (2016). Fifth, brand loyalty was measured with three items cited from Hwang and Park (2018) and Zeithaml et al. (1996). Last, all of these measures were evaluated via seven-point Likert-type scales anchored by “strongly disagree (1)” and “strongly agree (7).”

3.2. Data collection

In order to test the moderating role played by the type of employee, robots or humans, two surveys were performed to collect data from a coffee shop in which robots provided services and a coffee shop in which humans provided services. Brands are a significant factor affecting a choice of products in the coffee industry (Han et al., 2018; Song et al., 2019), so sample bias can occur when comparing different brands. For this reason, data were collected from D coffee brand in this study because, unlike other coffee brands in South Korea, the D coffee brand operates coffee stores in which robots provide services and also coffee stores in which humans provide services. In the study's case of a robot coffee shop, a robot barista provided services, and the coffee was designed for takeout, so there was no space for customers to sit and drink coffee in the store (see Appendix). Customers could order from menus through their smartphones before arriving at the store. In addition, the robot barista could serve 90 coffees per hour, as well as make 14 coffees at the same time. In the study's case of a human coffee shop – essentially, a regular coffee shop – customers could come into the store, order, receive, and drink their coffee at the store.

For the two surveys, we used a data collection company. The company trained 10 interviewers for ensuring accurate and appropriate data collection. They waited in front of each store and conducted their surveys with the customers who used the coffee service. Prior to the surveys, respondents were fully informed about the purpose of this study.

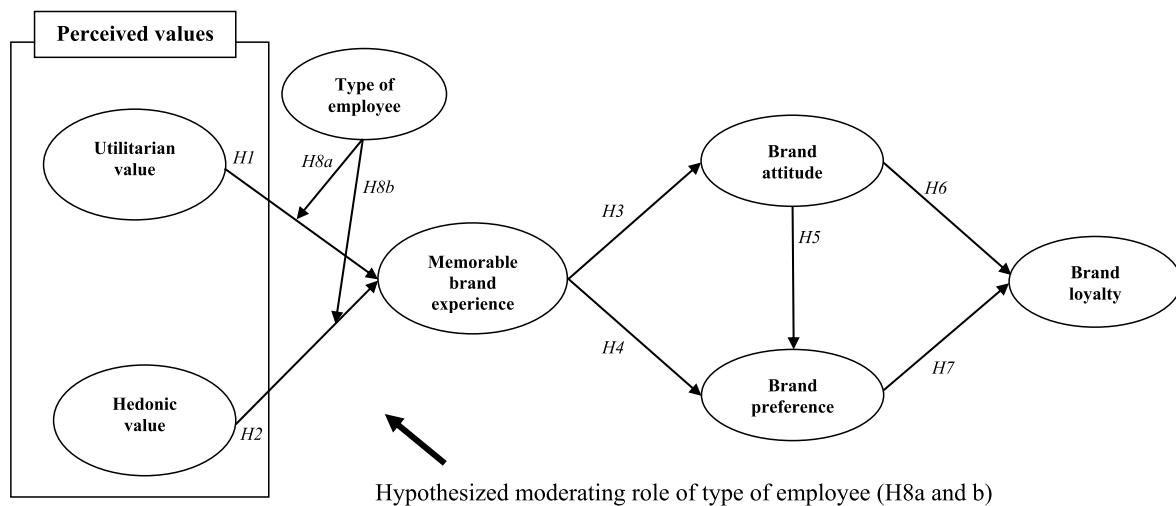


Fig. 1. Proposed conceptual model.
 Notes 1: NFI = normed fit index, IFI = incremental fit index, CFI = comparative fit index, TLI = Tucker-Lewis index, and RMSEA = root mean square error of approximation
 Notes 2: **p* < .05.

First, in terms of coffee stores with robots providing the services, a total of 339 questionnaires were collected, but four samples were deleted after checking for multivariate normality. Consequently, our statistical analysis was conducted based on 335 samples. Second, regarding coffee stores with humans providing the services, a total of 365 samples were collected. However, 14 outliers were removed because of multivariate normality. As a result, 351 samples were employed for statistical analysis. This study employed confirmatory factor analysis (hereafter CFA) and structural equation modeling (hereafter SEM). The prior studies, such as Hair et al. (2006) and Weston and Gore (2006) suggested that more than 200 samples are appropriate for performing CFA and SEM with the maximum likelihood estimation method.

4. Data analysis

4.1. Profile of the respondents

Table 1 presents the profile of the respondents. In the case of a coffee shop in which robots provided services, the 335 respondents consisted of 138 males (41.2%) and 197 females (58.8%). Additionally, respondents in their 20s were the largest group (*n* = 125 and 37.3%), and 61.5% of the respondents (*n* = 206) held a bachelor's degree. In terms of marital status, 51.3% of the respondents (*n* = 172) were unmarried. Finally, 84 respondents (25.1%) answered that their monthly income level was between 5001\$ US-6000\$ US.

Of the 351 respondents from a coffee shop in which humans provided services, 40.2% (*n* = 141) were males and 59.8% (*n* = 210) were females. In addition, those in their 20s were the largest group (*n* = 123 and 35.1%), and the majority of the respondents (63.0% and *n* = 221) held a bachelor's degree. Regarding marital status, 52.2% (*n* = 358) were single. Finally, the largest proportion of the respondents (21.1% and *n* = 74) reported a monthly household income of 8001\$ US or greater.

4.2. Confirmatory factor analysis

Table 2 shows the results of a confirmatory factor analysis (CFA) for three models: an initial model for a coffee shop in which robots provided services (hereafter CR), a second model for a coffee shop in which

Table 1
 Profile of survey respondents.

Variable	A coffee shop where robots provide services (<i>n</i> = 335)	A coffee shop where people provide services (<i>n</i> = 351)	Merging two data (<i>n</i> = 686)
Gender			
Male	138 (41.2%)	141 (40.2%)	279 (40.7%)
Female	197 (58.8%)	210 (59.8%)	407 (59.3%)
Age			
20s	125 (37.3%)	123 (35.1%)	248 (36.2%)
30s	97 (29.0%)	110 (31.3%)	207 (30.2%)
40s	58 (17.3%)	60 (17.1%)	118 (17.2%)
50s	47 (14.0%)	48 (13.7%)	95 (13.8%)
60s	8 (2.4%)	10 (2.8%)	18 (2.6%)
Education level			
Less than High school diploma	41 (12.2%)	32 (9.1%)	73 (10.6%)
Associate's degree	73 (21.8%)	45 (12.8%)	118 (17.2%)
Bachelor's degree	206 (61.5%)	221 (63.0%)	427 (62.2%)
Graduate degree	15 (4.5%)	53 (15.1%)	68 (9.9%)
Marital status			
Single	172 (51.3%)	186 (53.0%)	358 (52.2%)
Married	160 (47.8%)	163 (46.4%)	323 (47.1%)
Others	3 (.9%)	2 (.6%)	5 (.7%)
Income level			
8001\$ US and over	29 (8.7%)	74 (21.1%)	103 (15.0%)
7001\$ US -8000 \$ US	27 (8.1%)	24 (6.8%)	51 (7.4%)
6001\$ US -7000 \$ US	43 (12.8%)	43 (12.3%)	86 (12.5%)
5001\$ US -6000 \$ US	84 (25.1%)	45 (12.8%)	129 (18.8%)
4001\$ US -5000 \$ US	62 (18.5%)	43 (12.3%)	105 (15.3%)
3001\$ US -4000 \$ US	51 (15.2%)	46 (13.1%)	97 (14.1%)
2001\$ US -3000 \$ US	27 (8.1%)	54 (15.4%)	81 (11.8%)
Under 2000\$ US	12 (3.6%)	22 (6.3%)	34 (5.0%)

Table 2
Confirmatory factor analysis: Items and loadings.

Construct and Scale Item	Standardized Loading ^a		
	CR	CP	MTD
Perceived values			
Utilitarian value			
It was convenient.	.847	.844	.878
It was economical.	.933	.949	.957
It was pragmatic.	.900	.809	.887
Hedonic value			
I was happy.	.795	.844	.856
It was fun.	.817	.759	.822
It was truly a joy.	.888	.883	.893
Memorable brand experience			
I have fond memories of this coffee brand.	.885	.836	.853
I have had memorable experiences from this coffee brand.	.776	.841	.824
Thinking of this coffee brand brings back good memories.	.876	.880	.874
Brand attitude			
Attitude toward using this brand ...			
Unfavourable–Favorable	.847	.873	.872
Negative–Positive	.946	.921	.940
Bad–Good	.935	.914	.930
Brand preference			
When I want to have coffee, I often consider this coffee brand a good choice.	.877	.799	.864
This coffee brand meets my needs better than other coffee brands.	.903	.899	.912
I am interested in this coffee brand more than in other coffee brands.	.820	.845	.859
Brand loyalty			
I say positive things about this coffee brand to others.	.886	.884	.902
I would like to use this coffee brand more often.	.918	.846	.895
I would like to use this coffee brand in the future.	.934	.861	.907

Goodness-of-fit statistics.

CR: $\chi^2 = 257.747$, $df = 120$, $\chi^2/df = 2.148$, $p < .001$, NFI = 0.954, CFI = 0.974, TLI = 0.967, and RMSEA = 0.059.

CH: $\chi^2 = 347.501$, $df = 120$, $\chi^2/df = 2.896$, $p < .001$, NFI = 0.936, CFI = 0.957, TLI = 0.945, and RMSEA = 0.074.

MTD: $\chi^2 = 451.018$, $df = 120$, $\chi^2/df = 3.758$, $p < .001$, NFI = 0.963, CFI = 0.972, TLI = 0.965, and RMSEA = 0.063.

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.

humans provided services (hereafter CH), and a third model that merged the two (hereafter MTD). The three models each had an acceptable fit (CR: $\chi^2 = 257.747$, $df = 120$, $\chi^2/df = 2.148$, $p < .001$, NFI = 0.954, CFI = 0.974, TLI = 0.967, and RMSEA = 0.059; CH: $\chi^2 = 347.501$, $df = 120$, $\chi^2/df = 2.896$, $p < .001$, NFI = 0.936, CFI = 0.957, TLI = 0.945, and RMSEA = 0.074; and MTD: $\chi^2 = 451.018$, $df = 120$, $\chi^2/df = 3.758$, $p < .001$, NFI = 0.963, CFI = 0.972, TLI = 0.965, and RMSEA = 0.063) (Byrne, 2001). In addition, the values of the factor loadings were equal to or greater than 0.776 for the CR model, 0.759 for the CH model, and 0.822 for the MTD model.

As shown in Table 3, all of the values of the average variance extracted (AVE) for the three models were higher than 0.50, which indicated a high level of convergent validity (Fornell & Larcker, 1981). Furthermore, the analytic results revealed that all of the values of the composite reliabilities for the three models exceeded 0.70, which supported the reassurance that there was no problem with internal consistency (Hair et al., 2006). Finally, all values of the AVE for the three models were greater than the values of the squared correlations (R^2) between any pair of constructs, thus indicating a high level of discriminant validity (Bagozzi & Yi, 1988).

4.4. Structural equation modeling

A structural equation modeling (SEM) analysis was employed to check the proposed hypotheses, and the results of that SEM are presented in Fig. 2. The overall evaluation of the model fit showed an adequate fit of the model to the data ($\chi^2 = 667.380$, $df = 127$, $\chi^2/df = 5.255$, $p < .001$, NFI = 0.945, CFI = 0.955, TLI = 0.946, and RMSEA = 0.079). Of the first seven hypotheses, all seven were statistically supported at $p < .05$. More specifically, utilitarian ($\beta = 0.151$ and $t = 3.445^*$) and hedonic values ($\beta = 0.666$ and $t = 13.167^*$) both positively affected memorable brand experiences, which supported Hypotheses 1 and 2. In addition, memorable brand experience had a positive influence on brand attitude ($\beta = 0.646$ and $t = 16.363^*$) and brand preference ($\beta = 0.565$ and $t = 13.492^*$). Thus, Hypotheses 3 and 4 were supported. The data analysis indicated that brand attitude significantly affected brand preference ($\beta = 0.368$ and $t = 9.988^*$) and brand loyalty ($\beta = 0.203$ and $t = 5.499^*$), which supported Hypotheses 5 and 6. Last, there was a positive relationship between brand preference and brand loyalty ($\beta = 0.731$ and $t = 17.420^*$). Therefore, Hypothesis 7 was supported.

4.5. Moderating role of type of employee

This study employed multiple-group analyses in order to check the moderating role exerted by the type of employee, and those results are shown in Table 4. First, the results of data analyses indicated that the type of employee played a moderating role in the relationship between utilitarian value and a memorable brand experience ($\Delta\chi^2 = 9.505 > \chi^2 = 0.5(1) = 3.84$, and $df = 1$), which supported Hypothesis 8a. More specifically, the path coefficient for the CR group ($\beta = 0.319$ and $t = 4.906^*$) was higher than the path coefficient for the CH group ($\beta = 0.108$ and $t = 2.171^*$), meaning that customers who used a coffee shop in which robots provided services were more likely to have a memorable brand experience when they perceived high levels of utilitarian value than were customers who used a coffee shop in which humans provided services.

Second, the data analysis results revealed that the type of employee moderated the relationship between hedonic value and a memorable brand experience ($\Delta\chi^2 = 10.573 > \chi^2 = 0.5(1) = 3.84$, and $df = 1$). Thus, Hypothesis 8b was supported. In particular, the path coefficient for the CH group ($\beta = 0.758$ and $t = 11.387^*$) was greater than the path coefficient for the CR group ($\beta = 0.442$ and $t = 6.423^*$), meaning that customers who used a coffee shop in which humans provided the services were more likely to have a memorable brand experience when they perceived high levels of hedonic value than were customers who used a coffee shop in which robots provided the services.

5. Discussion and implications

Firstly, the current study investigated the effects of perceived value on a memorable brand experience in the context of the coffee industry. Secondly, we identified the effects of a memorable brand experience on brand attitude and brand preference. Furthermore, we examined the influence of brand attitude on brand preference and brand loyalty, and investigated the influence of brand preference on brand loyalty. Lastly, we explored the moderating effect of the type of employee (i.e., a robot versus a human) on the relationship between perceived value and a memorable brand experience in the coffee industry. The discussions are as follows.

First, this study proposed utilitarian value and hedonic value as antecedents of a memorable brand experience, and our results confirmed positive relationships for both types of values that are similar to previous studies (Hwang & Lee, 2018; Moon & Han, 2019). This study found that when consumers achieved their goal with their coffee brand, their positive perceptions of the brand’s effectiveness (utilitarian value) and of fun and enjoyment (hedonic value) led to additional good memories about that coffee brand. It is worth mentioning that in the current study

Table 3
Descriptive statistics and associated measures.

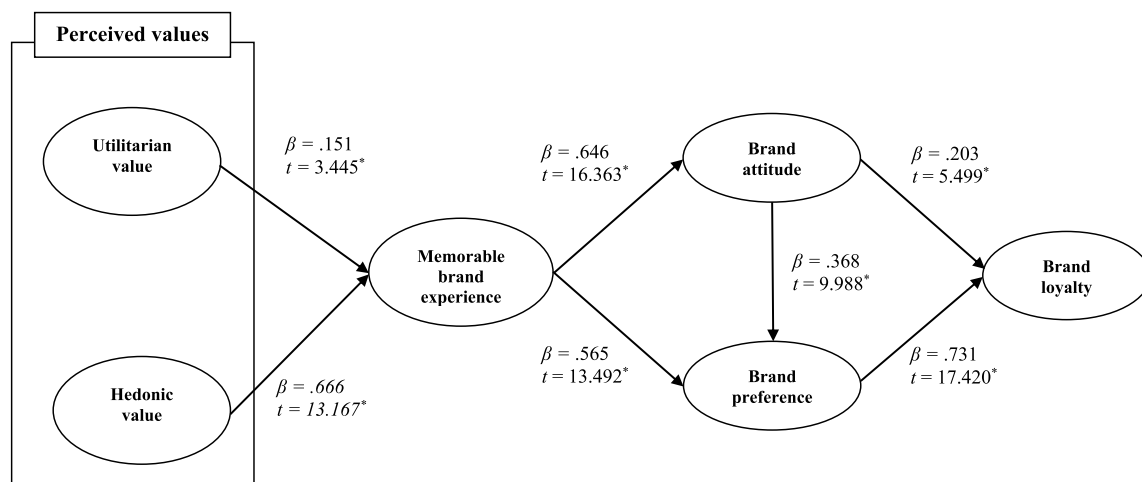
	Mean (Std dev.)	AVE	(1)	(2)	(3)	(4)	(5)	(6)
(1) Utilitarian value	5.95 (.82)	.799	.923	.638 ^a	.561	.442	.612	.592
	<u>5.00 (.89)</u>	<u>.756</u>	<u>.902</u>	<u>.550</u>	<u>.472</u>	<u>.510</u>	<u>.583</u>	<u>.526</u>
	5.46 (.98)	.825	.934	.691	.536	.566	.682	.651
(2) Hedonic value	6.04 (.84)	.696	.407 ^b	.873	.599	.584	.670	.644
	<u>4.95 (.91)</u>	<u>.689</u>	<u>.303</u>	<u>.869</u>	<u>.786</u>	<u>.595</u>	<u>.722</u>	<u>.681</u>
	5.48 (1.03)	.735	.477	.893	.707	.650	.760	.733
(3) Memorable brand experience	5.68 (.90)	.718	.315	.618	.884	.516	.714	.570
	<u>5.31 (.89)</u>	<u>.727</u>	<u>.223</u>	<u>.517</u>	<u>.889</u>	<u>.602</u>	<u>.736</u>	<u>.744</u>
	5.49 (.91)	.723	.287	.500	.887	.759	.735	.678
(4) Brand attitude	6.07 (.88)	.829	.195	.354	.266	.935	.702	.659
	<u>5.37 (1.12)</u>	<u>.815</u>	<u>.260</u>	<u>.510</u>	<u>.362</u>	<u>.930</u>	<u>.682</u>	<u>.731</u>
	5.71 (1.07)	.836	.320	.423	.576	.939	.730	.739
(5) Brand preference	5.55 (.93)	.752	.375	.521	.510	.493	.901	.817
	<u>4.67 (.99)</u>	<u>.720</u>	<u>.340</u>	<u>.566</u>	<u>.542</u>	<u>.465</u>	<u>.885</u>	<u>.758</u>
	5.10 (1.06)	.772	.465	.578	.540	.533	.910	.774
(6) Brand loyalty	5.72 (.89)	.833	.350	.464	.325	.434	.667	.937
	<u>4.94 (.91)</u>	<u>.746</u>	<u>.277</u>	<u>.508</u>	<u>.554</u>	<u>.534</u>	<u>.575</u>	<u>.898</u>
	5.32 (.98)	.812	.424	.537	.460	.546	.599	.929

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



$\chi^2 = 667.380$, $df = 127$, $\chi^2/df = 5.255$, $p < .001$, $NFI = .945$, $CFI = .955$, $TLI = .946$, and $RMSEA = .079$

Notes 1: 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 2: * $p < .05$

Fig. 2. Standardized theoretical path coefficients.

Table 4
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			$\Delta\chi^2$ (254) = 759.192	χ^2 difference	Hypotheses
	β	t-value	β	t-value				
H8a U → MBE	.319	4.906*	.108	2.171*	$\Delta\chi^2$ (255) = 768.697	$\Delta\chi^2$ (1) = 9.505	Supported	
H8b H → MBE	.442	6.423*	.758	11.387*	$\Delta\chi^2$ (255) = 769.765	$\Delta\chi^2$ (1) = 10.573	Supported	

Notes 1: U = Utilitarian value, H = Hedonic value and MBE = Memorable brand experience.

Notes 2: * $p < .05$.

Notes 3: $\Delta\chi^2(1) = 3.84$ and $p < .05$.

the customers' perceived hedonic value had a greater influence on their memorable brand experience than their perceived utilitarian value did. That result is different from findings in some previous hospitality literature, which showed that utilitarian value had a greater impact on the customer experience. For example, Ha and Jang (2010) investigated how utilitarian value and hedonic value influenced the satisfaction and behavioral intention of the customers in Korean restaurants in the US. Overall, the utilitarian value, in terms of price, variety of menu, and taste, had larger effects on customer satisfaction and behavioral intention than hedonic value, such as cultural ambiance, did. To conclude, both utilitarian value and hedonic value were important elements for consumers' memorable brand experience, but the impact of hedonic value was more appreciated in association with the coffee brand. That may be because people generally like to engage in pleasurable and relaxing moments when they have coffee.

Second, a memorable brand experience was positively related to brand attitude and brand preference. This finding is in line with Chang and Chieng's (2006) claim that brand experience was positively associated with brand attitude and brand loyalty. Once consumers have fond memories of a specific coffee brand, they are more likely to formulate a favorable attitude and are more interested in that coffee brand than in other coffee brands. These results show how important it is to provide consumers with a coffee experience that is imprinted on their memory. In fact, the South Korean coffee market is one of the top markets worldwide. South Korea's capital, Seoul, has more coffee shops per capita (17 per 10,000) than Seattle (15 per 10,000) or San Francisco (14.7 per 10,000) (Lee & Kim, 2016). Thus, South Korea provides a very competitive market in which to try to stand out among all the coffee brands in the market. According to the findings of this study, consumers' positive attitude and a high level of coffee brand preference greatly depended on their memorable brand experience.

Third, the results showed brand attitude is a strong predictor of brand preference. Whereas the importance that consumers' attitude toward a product has for brand preference has been mentioned often (Fam et al., 2013; Kudeshia & Kumar, 2017), it has not been widely researched in the context of coffee branding. This study demonstrated that consumers with a strong coffee brand attitude tend to be much more interested in that coffee brand than in other coffee brands. In addition, we found that brand attitude was positively related to brand loyalty. This result was also consistent with that of previous studies (Kang et al., 2011; Song et al., 2019), which indicated that a positive attitude toward the coffee store affected customers' behavioral intention to repurchase. Likewise, this study showed that customers' favorable attitude toward a coffee brand will lead them to develop brand loyalty, such as their willingness to use the coffee brand more often in the future or to say positive things about the coffee brand to their friends and families.

Fourth, this study postulated that brand preference would have a positive impact on brand loyalty. In other words, consumers who considered a particular coffee brand to be a good choice from among other coffee brands would be likely to use that coffee brand more often in the future. This finding, too, is in line with previous studies (e.g., Wróblewski & Mokrysz, 2018). Wróblewski and Mokrysz (2018) found that particularly preferred coffee brands were more frequently

consumed by their respondents in Poland, although in their study, they did not test the linear relationship empirically.

Fifth, this study proposed the type of employee as a moderating variable on the linear relationship between perceived value and a memorable brand experience. Whereas some previous scholars have described how people perceived human-robot interactions and evaluated the service quality in hospitality (Belanche et al., 2020; Choi et al., 2019), very few studies have empirically tested to measure the moderating role of the type of employee (robot or human) in the link between perceived value and a memorable brand experience, particularly in the coffee industry. This study found that utilitarian value contributed more to the enhancement of a memorable brand experience when consumers were served their coffee by a robot barista. That finding may result from the impression that consumers have toward the current version of a robot barista, which may not be too different from a coffee vending machine. Although a robot barista is more technically sophisticated and developed than a coffee vending machine, it still has many features that give it the impression of a machine that is simply being automated. When consumers use a coffee vending machine, they are more interested in how they can obtain their coffee more efficiently and conveniently than they are in how they can obtain fun, happiness, and enjoyment through the machine. Likewise, consumers may appreciate the utilitarian value of a coffee brand more than its hedonic value when they are served by a robot barista. Therefore, for coffee shops to enhance the memorable brand experience for consumers, it will be important to focus on the utilitarian value of robot baristas rather than on their hedonic value.

Meanwhile, the relationship between hedonic value and a memorable brand experience became stronger when consumers experienced their coffee brand with a human barista. This result showed that the hedonic value, in the form of the happiness and enjoyment that consumers perceived with their coffee brand, was more effective in increasing the level of a memorable brand experience for them when they interacted with a human than when they interacted with a robot.

Discussing this finding is important because it proves that consumers actually perceive innovative and traditional ways of experiencing coffee differently to create a memorable brand experience. Gorgoglione et al. (2018) performed a positioning analysis to show how consumers perceive innovation- and tradition-related attributes of coffee brands. According to their findings, tradition and innovation are perceived as two opposite concepts by consumers in the coffee brand market. They also found that consumers who perceive a particular coffee brand as innovative are more likely to associate every characteristic of the brand with innovation. This provides a critical insight to practitioners who have adopted robot baristas or have plans to use robot baristas in the future. In order to manage a coffee brand effectively, it is important to investigate the responses of consumers from their perspective (Gorgoglione et al., 2018) because managers may show certain values of products but customers may interpret and define those differently (Kay, 2006).

5.1. Theoretical implications

First, this study investigated how robot baristas are perceived by consumers. Several hospitality researchers have acknowledged that an application of robotics in the hospitality industry could create a new experience that would appeal to more consumers in today's world (Kim et al., 2020; Mende et al., 2019). However, few studies explored the moderating effect of the type of employee (a robot barista vs. a human barista) on the relationship between perceived value and a memorable brand experience. Therefore, this study contributes to previous literature by investigating customers' different perceptions on memorable coffee brand experience between a robot barista and a human barista.

Second, this study validated an important role of multidimensional values in the formation of a memorable coffee brand experience. In the initial stages of research on value initialization, meaning was captured as being solely price-based and was measured using a unidimensional measurement (Duman & Mattila, 2005). In addition, many restaurant management studies have measured value as the value derived in exchange for money (e.g., Liu & Jang, 2009; Ryu et al., 2010). However, other scholars proposed that, although the unidimensional approach might be applied to measure the functional utility provided by the product, it may be too simplistic and narrow to explain the full value provided by the consumption experience as a whole (Babin et al., 1994; Sweeney & Soutar, 2001). Therefore, this study validated the effects that both the functional utility of the product and the hedonic value of the consumer's response exerted on a memorable coffee brand experience.

Third, this study identified the antecedents of consumers' brand loyalty when they considered drinking coffee. Specifically, we examined the interrelationships among perceived value, memorable brand experience, brand attitude, brand preference, and brand loyalty. Previous studies proved perceived value effective in explaining a memorable brand experience. Moreover, a memorable brand experience, as well as brand attitude and brand preference, has been identified as important antecedents to predicting brand loyalty, particularly in the context of a coffee brand. This study successfully proposed and validated a conceptual model that effectively demonstrated the process by which consumers' perceived value led to brand loyalty through a memorable brand experience, brand attitude, and brand preference. Moreover, the results showed the type of employee that waited on the customer was a moderator in the link between perceived value and a memorable brand experience. This result provides scholars with insights into whom to consider when they examine the type of employee as a moderating variable in the hospitality literature.

5.2. Practical implications

The primary practical implication from this study suggests that coffee industry practitioners should focus on enhancing both the utilitarian value and the hedonic value of their brand in their efforts to increase consumers' memorable brand experience. In terms of utilitarian value, coffee industry practitioners should continuously ask the following questions: What are our consumers' primary goals when they use our coffee brand? To what extent do customers appreciate the economic value of our coffee brand? What kinds of practicality do consumers appreciate when they use our coffee brand? By answering these questions, coffee brand companies can enhance their brand's utilitarian value for consumers. At the same time, coffee brand companies should

also identify the moments when, how, and why their consumers feel happiness, fun, and enjoyment. Therefore, it is recommended that coffee industry practitioners design and conduct both a survey questionnaire and in-depth interviews with customers. Implementing market research is not an easy task, but it will help coffee industry practitioners to accumulate critical data on their consumers, and ultimately to increase their consumers' memorable brand experiences.

Second, based on the study's findings, we recommend that coffee brand companies who have adopted robot baristas or plan to use them concentrate more on their brand's utilitarian value than on its hedonic value. That focus will be more effective in increasing their consumers' memorable brand experience. Robot baristas are quite new to the industry and consumers, and are not fully commercialized yet in the market. At this moment, consumers may not expect to have warm feelings or a natural interaction with a robot barista. Instead, as long as the robot barista serves consumers the correct coffee that they ordered, they may feel the mission was accomplished.

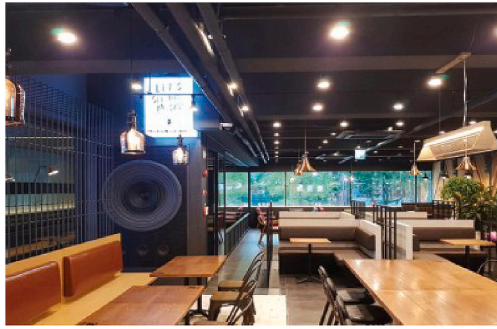
Furthermore, robot baristas can play a significant role under the current pandemic conditions. With a robot server, consumers do not need to worry about being exposed to the virus, in contrast to the very real worries that accompany any face-to-face interaction among humans. Therefore, if the consumers' goal and mission are related to having coffee without the risk of catching COVID-19, coffee practitioners can strongly emphasize the safety-related functional utility of a robot barista to consumers. At the same time, according to our findings, promotional material that emphasizes a significant hedonic value from a robot barista may not be the best strategy for increasing consumers' memorable brand experience.

Fourth, we recommend that coffee brand companies that have no plans to adopt robot baristas, but still must compete with robots, focus their emphasis on their brand's hedonic value rather than on its utilitarian value, in their efforts to create a memorable brand experience with their consumers. When promoting regular coffee shops that have human baristas, it will be effective to emphasize the characteristics that only human baristas provide, such as their sense of humor, warm smile, empathy, and passion, rather than their accuracy, speed, and technical skills. For example, human baristas can carefully and personally customize a coffee for a single customer, according to the customer's mood, the day's weather, and the day's special circumstances. Furthermore, while making a coffee, human baristas can have short conversations with their customers. Interactions and communion with other humans can generate fun and enjoyment – something that robot baristas cannot provide, at the moment. Thus, regular coffee brand companies can strongly and successfully emphasize a human barista's sincerity and genuine hospitality to their customers.

6. Limitations and future research

This study provides significant theoretical and practical implications, but it also had the following limitations. First, because the study collected data in South Korea, it is somewhat difficult to apply the findings of this study to other areas. More important is the issue of technology-based services differing according to cultural characteristics (Kumar, 2014), so research will need to be conducted on robot baristas in different regions in future studies. In addition, because this study was conducted in the context of the coffee industry its results have limited applicability to other industries, such as chefs in the restaurant industry.

Appendix. The two types of coffee shops



A coffee shop in which humans provide services.

Sources from dal.komm (2021)



A coffee shop in which robots provide services.

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