

Original Research

Brand Gender in the Global Smartphone Market and Relationship with Customer Loyalty and Brand Equity in Iran

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Abstract

This research aims to investigate whether smartphone brands have gender from the perspective of Iranian users and examine the relationship between different genders of smartphones and brand equity with mediating role of customer loyalty. This is a quantitative study that uses inferential statistics to evaluate hypotheses. A standardized questionnaire with 26 questions was used as the research instrument. The statistical population consisted of users of the six most widely-used smartphone brands in Iran (Samsung, Apple, Xiaomi, Huawei, Sony and Nokia), who could participate in the online survey through social networks (Instagram, WhatsApp, and Telegram). The simple random probability sampling method involved 472 samples. Smart PLS version 3 and SPSS version 26 were used to analyze the data. The research was carried out from June 2022 to February 2023. The results show that smartphones have gender from the perspective of Iranian users. Brand femininity and masculinity correlate significantly and positively with customer loyalty to smartphones. Customer loyalty has a significant and positive relationship with brand equity in smartphones. Both brand femininity and masculinity increase brand equity through customer loyalty, with brand femininity having a more significant impact on brand equity than brand masculinity. The biological gender of smartphone users has no relationship with customer loyalty and does not affect their perception of brand femininity and masculinity.

Keywords: Brand equity, Brand gender, Customer loyalty, Marketing Strategy, Smartphone.

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Introduction

The global smartphone market is rapidly expanding, and it is predicted that by 2030, 6.3 billion people (73% of the world's population) will own smartphones (*The Mobile Economy*, 2023). Although comparing smartphone performance details can be confusing, their brands are easily recognizable and significantly influence consumer purchasing decisions. (Kim *et al.*, 2020) According to statistics, revenue in the smartphone market in Iran will reach 5.56 billion dollars in 2023. this market is expected to grow annually at a rate of 1.19% (*Smartphones - Iran | Statista Market Forecast*, 2023). Therefore, the smartphone market in Iran provides a suitable opportunity for international managers to achieve profit and income. With the expansion and increasing competition of the smartphone industry, understanding brand loyalty has become an important topic among academics and professionals, also loyalty in a brand significantly impacts the choice of smartphone consumers compared to other products (Kim *et al.*, 2020). The level of brand loyalty has also been used as a measure of marketing strategy success and also as a relative measure of brand equity (Knox & Walker, 2001). Preserving and increasing brand value is the primary priority of most brand managers (Lieven, 2022). Brand equity is a crucial concept in marketing and has significant implications for brand management. (Theo Lieven, 2022, as cited in Farquhar, 1989; Aaker & Keller, 1990; Barwise, 1993; Keller, 2003). Currently, it is challenging for marketers to achieve brand equity through traditional means because, due to intense competition, companies' products have become indistinguishable in terms of function, leading consumers to make choices based on emotional rather than rational factors. As a result, brands have become a key differentiator for companies, expanding beyond a set of attributes to encompass a range of experiences (Khan *et al.*, 2022). In the recent decade, scholars as well as practitioners have paid close attention to the consumer-brand connection. Understanding the relationships between consumers and their brands is important for businesses, since this relationship has a substantial impact on a company's profitability (Ghorbanzadeh *et al.*, 2020).

Brand equity, brand image, and brand loyalty are the most studied branding concepts in the 21st century (Parris & Guzmán, 2023). So, it is valuable to examine these concepts in the context of Smartphones. After thoroughly examining the existing literature, we realized that creating a distinctive strategy to improve brand equity across various countries is challenging. By contrast, brand personality evaluation can provide a unique value measure for multinational corporations (Lieven *et al.*, 2018). However, developing a model that accounts for cross-cultural variances in brand personality can lead to a complex and potentially conflicting model that poses a significant risk. Utilizing a simple model to assess the influence of brand personality on brand value to mitigate this risk can facilitate its use by marketing managers and eliminate the need for specific currency conversions to compare results in different countries, thus enhancing the model's profitability (Lieven *et al.*, 2018). This is exactly where the brand's gender comes into play.

As gender is a fundamental aspect of personal identity and studies have shown that gender meaning influences brand preference, it is unsurprising that consumers perceive gender signals about brands. (Till and Priluck, 2001). Recently, the understanding of brand personality has advanced with the creation of a scale that assesses gender identity,

identifying masculine and feminine traits in people. Consumers express their masculinity and femininity through their choice of brands as it is a part of their self-concept (Sun, 2022). In recent years, previous research has focused on the relationship between brand gender and brand equity (Lieven, 2022; Sun, 2022; Khan et al., 2022; Vacas de Carvalho et al., 2020; Machado et al., 2019), primarily in masculine cultures. However, studies in feminine cultures are limited. Brand gender is a type of brand personality, that it is considered as a key factor in building brand equity (Sun & Kim, 2023). In 2009, Grohmann introduced a model that articulates the gender dimensions of brand personalities. This model comprises 12 traits and outlines two distinct brand personality factors: masculine brand personality (MBP) and feminine brand personality (FBP) (Grohmann, 2009). Grohman's (2009) model is valid and reliable for measuring brand gender and positively predicts brand value (Lieven *et al.*, 2014). Although previous studies have shown that consumer gender congruity with a brand name affects brand loyalty, limited research has been conducted on the impact of brand gender on customer loyalty. Evidence regarding this relationship's fundamental sources remains limited. Establishing a significant relationship between brand gender as a crucial aspect of brand personality and brand loyalty has the potential to assist marketing managers in developing strategic plans to increase brand equity and incorporate them into marketing programs (Torabi *et al.*, 2020). Thus, the aim of this study is divided into three main categories; first, specify the gender of six dominant smartphone brands in the Iranian market from the user's perspective, second determine the relationship between smartphone brand gender and brand loyalty and third, distinguish the relationship between smartphone brand gender and brand equity by mediating the role of brand loyalty.

The choice of smartphones as the subject of investigation is an appropriate decision that brings innovation in the concept of this study. Also, smartphones are considered gender-neutral products (*Mobile Phones, Like All Technologies, Are Gender Neutral*, 2013) that both men and women use to a similar extent, thereby reducing gender bias. Furthermore, direct and daily interaction between customers and brands is expected to generate more practical results, given that smartphones are currently used by at least one brand by everyone. Suppose the study determines that brands with gendered characteristics, particularly those with more masculine or feminine traits, lead to higher customer loyalty. In that case, implementing a gender-based model becomes a viable option for marketing initiatives. Additionally, since Iran is classified as a collectivist and relatively feminine culture based on Hofstede's insights ("Country comparison tool", 2023), and most research on the impact of brand gender on loyalty and brand equity has been conducted in countries with individualistic and masculine cultures, this study's findings can significantly enrich the literature on brand gender. The rest of this study is organized in the following way. First, we will examine the extensive literature on this research subject. Then, we reveal the conceptual model that we have meticulously developed. Next, we explore the details of the research methodology. In the final phase, we elaborate on the results obtained and explain the postulated hypotheses, leading to the identification of the practical applications of our research. We offer practical recommendations and suggestions for intrepid researchers who wish to delve into this field.

Literature Review

The history of gender and brand research has been extensive, with numerous studies conducted on the impact of gender identity on brand loyalty and brand equity. In this section, we delve deeper into these studies and explore the relationship between gender identity and brand equity.

Gender identity is an integral part of our understanding of the self and is often the most easily recognizable personality trait. Unlike sex, gender is not biologically determined but is constructed, developed and modified through social and cultural exchanges (Sandhu, 2017). Gender identity is defined as the degree to which an individual identifies with masculine or feminine personality traits (Neale et al., 2016). After Grohmann's (2009) seminal research, many types of research have been conducted on the concept of brand gender. Brand gender is one of the important constructs of brand personality and most importantly the components of brand personality (Khan et al., 2022). The findings emphasize that managers can significantly benefit from creating strong gender attributes for their brands. Specifically, the findings show that by inducing a brand with a masculine or feminine personality, managers increase consumers' affective reactions, brand love (BL) and behavioral response, and consumer brand engagement (CBE) with the brand, thereby increasing CBBE (Machado et al., 2019). One of the fundamental studies conducted in the field of brand gender was the 2009 study by Grohmann. She began her research by raising the issue that although masculinity and femininity are personality traits associated with brands, their measurement and contribution to brand theory and practice have not been examined. Measures of masculinity and femininity as human personality traits have not yet been validated in the context of brand personality. Grohmann defines the gender dimensions of brand personality as a set of human personality traits related to masculinity and femininity that are applicable and relevant to brands, in accordance with the definitions of brand personality. Ultimately, these dimensions are captured by a two-dimensional descriptive adjective scale of 12 items (MBP/FBP) that is applied to functional and symbolic brands. The Grohmann gender model, along with its extensive validation involving over 2,800 participants in eight studies, demonstrated that the MBP/FBP scale is more suitable for measuring the gender dimensions of MBP and FBP than human personality measures.

Chowdhury et al (2023) investigated desired smartphone attributes and their influence on brand advocacy among young customers in Bangladesh. It also explores the moderating role of gender identity in the relationship between these attributes and word-of-mouth promotion for smartphone brands. The research adopted a quantitative approach for investigation. The authors collected data through a survey questionnaire. The collected data was analyzed using structural equation modeling (SEM). The study concludes that it provides a reliable model for understanding what young customers want in a smartphone brand. It also shows how different attributes of the brand influence users' advocacy, and gender identity influences the way young customers talk positively about smartphone brands. Masculine individuals emphasize sociability and intellectuality, while feminine individuals focus on emotionality and physicality.

Theo Lieven et al (2022) studied how behavioral branding affects brand equity. In this study, gender structure (Grohmann gender model, 2009) made it possible to compare the personality of the salesperson and the personality of the brand. Gender was chosen as a conscious personality model since; Other models are criticized for not being replicable or applicable. Results showed that employee personality strengthens brand equity and vice versa. The study makes a strong theoretical contribution by demonstrating the effect of behavioral branding on brand equity.

Sulistyo et al (2021) investigated the relationship between brand gender, consumer involvement, and brand love in COSRX skincare products. The study uses a sample of 150 COSRX skincare product consumers. The data is collected through a questionnaire and analyzed using structural equation modeling. It explores how brand gender influences consumer involvement and brand love, and how consumer involvement mediates the relationship between brand gender and brand love. Results show that Brand gender has a positive and significant impact on consumer engagement and brand love. The study suggests that a brand with a strong gender positioning can influence consumers to share their experiences with others. When a brand reflects the masculinity and femininity of its consumers, they are more likely to recommend, engage, and invest in the brand, leading to emotional attachment and consumer love.

Sun (2022) analyzed the perceptions of Airbnb brand gender across cultures based on gender and brand identity. The method of this study was exploratory by comparing two countries with different cultural backgrounds (American vs. Korean). They aimed to understand how users perceive the gender of the Airbnb brand. Additionally, examining the impact of gender and gender identity on brand gender. Lastly, observation of cultural differences in gender perception of the Airbnb brand. The findings showed that gender identity significantly influenced brand gender for Americans, while masculine gender identity (MGI) affected the perception of MBP and feminine gender identity (FGI) affected FBP. The study found that gender plays a significant role in the relationship between gender identity and brand gender for Americans but is a moderating variable for Koreans. The influence of gender identity on brand gender is stronger in the United States than in Korea.

Khan et al (2022) conducted a study with the purpose of investigating the effect of brand gender on consumer-based brand equity through two mediators (i.e., customer interaction with the brand and emotional attachment to the brand), by analyzing data from a survey of 299 respondents using structural equation modeling. They found that brand gender aligns with consumer brand interaction and emotional attachment, creating consumer-based brand equity. Aligning brands based on gender matches consumer gender, attracting and engaging consumers, and fostering brand equity.

Torabi et al (2020) investigated the significance of gender difference for products like Bik perfume, which are classified as gender products, by looking at the literature on the topic and the lack of clear documentation on the relationship between brand gender, brand value and brand love. They conducted a study to investigate the effect of brand gender on CBBE with the mediating role of Consumer brand involvement and brand love. The researchers used a questionnaire of 384 Tehran Bik perfume customers based on a previous study by Machado et al (2018). The structural equation modeling method was

used to test the theoretical model and calculated the impact coefficients, using Visual-PLS software. Results showed that brand masculinity and femininity significantly influence brand equity, while consumer-brand involvement and love mediate the relationship between gender and brand equity.

Vacas de Carvalho et al (2020) conducted a study called "Bridging the Gap between Brand Gender and Brand Loyalty in Social Media: Examining Mediating Effects". The researchers hypothesized that if consumers view a brand as more feminine or masculine, they will have higher brand loyalty, particularly on Facebook. This study in Portugal examined the relationship between brand gender and brand loyalty on social media. Data from 677 Facebook users revealed that consumers' active involvement with brand name, perceived quality, and brand love supports the relationship. The study emphasizes the importance of a strong gender identity in enhancing brand loyalty.

A study conducted by Machado et al (2019) on Facebook analyzed the relationship between brand gender and customer-based brand equity (CBBE) using structural equation modeling. They conducted this study by relying on the fact that brand gender is offered as a relevant source of CBBE in the literature. They organized the research with the goal of deepening the comprehension of the relationship between brand gender and CBBE by evaluating the mediating role of CBE and BL. They found that brand gender indirectly affects CBBE through brand love (BL) and CBE. This confirms the benefits of clear gender positioning and suggests that brands with strong gender identities encourage BL and CBE.

Azar et al (2018) based on the fact that mixed target brands are not always successful in targeting men and women, especially in symbolic product categories, they discuss the possibility of using the endorsed brand strategy instead of the branded house strategy. To investigate the impact of introducing an approved and gender-incongruent brand alongside the main brand, this research employs pre- and post-tests. They found that using an endorsed brand strategy instead of branded house strategy can be effective in naming brands with non-conforming gender identities. The study found that adding a male endorsed brand name to a female original brand did not significantly increase masculinity, but adding a female endorsed brand name increased femininity. Women are more accepting of male original brands, while men are less accepting of female original brands. This has implications for branding strategies targeting both genders.

The study by Lieven and Hildebrand (2016) in a research entitled "The impact of brand gender on brand equity: Findings from a large-scale cross-cultural study in ten countries" explores the impact of brand gender on brand equity. To guarantee that multiple cultures were covered in this study, with participants from ten countries on four continents, the researchers employed the scale developed by Hofstede et al (2010). They found that androgynous brands generate higher brand equity than brands perceived as too masculine or too feminine. Additionally, their findings show a gender matching effect, with male consumers placing a higher value on masculine brands and female consumers placing a higher value on feminine brands. Also, highly masculine brands are more prevalent in individualistic cultures, while highly feminine brands are more prevalent in collectivistic cultures. This information can help international brand managers effectively manage brands across different countries by personalizing brand gender for each target

market or culture. On the other hand, androgynous brands create special brand value in all countries, so an androgynous brand position can be a key concept for a successful international standard strategy.

Ulrich et al (2011) investigate consumers' perceptions of brand gender and its dimensions. The author employs chosen dimensions of brand image defined by Aker (1991), to express the complex concept of brand, encompassing gender associations and integrating the brand name and logo as well, in accordance with prior research. The study finds that brand gender is a prominent concept, and consumers refer to brand gender when discussing brands. In addition, brand gender precedes product categorization for brand classification. The study also identified four types of brand gender, masculine, feminine, undifferentiated, and androgynous, the first three types were observed, and the fourth type, highly androgynous brands, was not observed. These findings are consistent with Grohmann's research on brands' gendered personalities.

A study conducted by Till & Priluck (2001) investigated whether gender perceptions of brands can be conditioned based on classical conditioning as an important theoretical mechanism. The results show that pairing a brand (perfume brand) with either masculine or feminine images affects the subjects' subsequent gender perception of that brand. Furthermore, evidence from this study indicates that belief conditioning (gender perception of brand name) can occur independently of overall attitudes.

Conceptual model and hypotheses

Based on the research literature and considering the role of brand gender and its impact on brand equity as mentioned in studies (Lieven and Hildebrand, 2016, Machado et al., 2019, Torabi et al., 2020 and Khan et al., 2022) and following the fact that the mediating role of customer loyalty in the relationship between brand gender and brand equity has not been considered in previous research, as well as the fact that few quantitative studies have been conducted in this area in Iran, the conceptual model of the present study is based on (Vacas de Carvalho et al., 2020) which we have changed it in terms of variables represented in the figure 1.

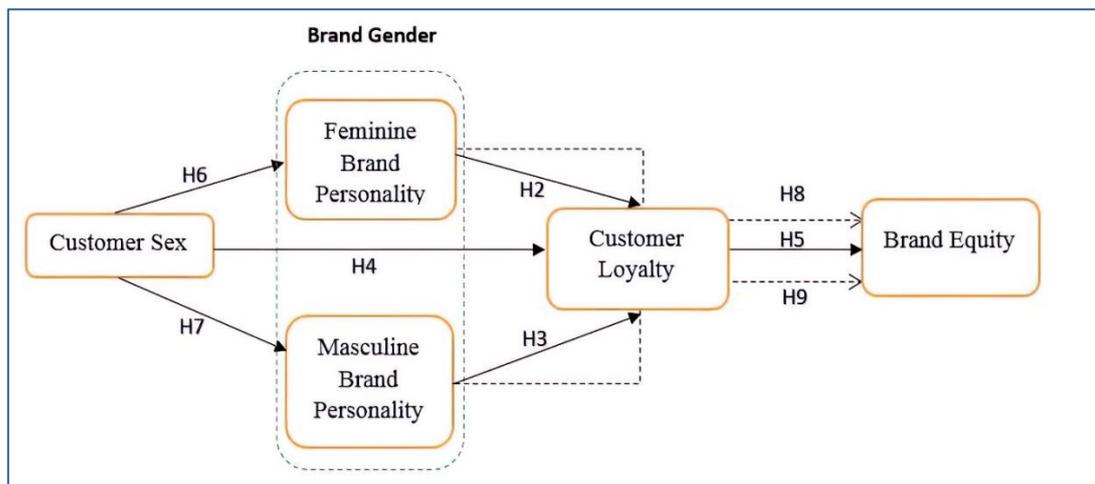


Figure 1. Conceptual model

Based on the presented conceptual model, the research hypotheses are formulated as follows:

Hypothesis 1. There are differences in masculinity and femininity among different smartphone brands.

Hypothesis 2. Brand femininity is related to customer loyalty in various smartphone brands.

Hypothesis 3. Brand masculinity is related to customer loyalty in various smartphone brands.

Hypothesis 4. Customer sex is related to customer loyalty in smartphone brands.

Hypothesis 5. Customer loyalty is related to brand equity in various smartphone brands.

Hypothesis 6. Customer sex affects the perception of brand femininity in smartphone brands.

Hypothesis 7. Customer sex affects the perception of brand masculinity in smartphone brands.

Hypothesis 8. Brand femininity affects brand equity through customer loyalty in different smartphone brands.

Hypothesis 9. Brand masculinity affects brand equity through customer loyalty in different smartphone brands.

Methodology

From a cognitive perspective, we use positivism philosophy and deductive approach, so this situation will clarify the way of our research strategy. This study employs quantitative approach to examine relationship between variables, has a practical aim that is being pursued and employs a descriptive-survey methodology for data collection. The key advantage of using survey methodology is that this approach constructs a systematic or organized set of data, known as a "variable matrix by case data, which gathers the attributes and features of each case according to the variable, leading to a systematic and rectangular set of data." (Khaki, 1999) that could lead to more systematic and reliable results. In terms of the time horizon of the research we used cross sectional method and for gathering data the most common technique employed in survey research is a questionnaire utilized in this study. Primary data was obtained through a standard questionnaire, whereas secondary information for literature was procured through library resources and reputable scientific article databases.

Data gathering

The present research employs the method of probability random sampling with a sample size of 472 individuals, following Morgan's table for populations greater than

100,000. The selected sample size was deemed appropriate considering the wide range of the statistical population under scrutiny. Because of the potential non-response from the questionnaire recipients, we distributed 714 web-based questionnaires through social media platforms, including WhatsApp, Telegram, and Instagram. Out of the total questionnaires, 511 were completed, resulting in a response rate of 88%. After removing non-reliable data (outliers), we included the remaining 472 questionnaires in the study. Data collection from questionnaires began in December 2022 and lasted for two months. The results of the descriptive statistics were analyzed and presented with the aid of SPSS software version 26.

Table 1. Demographic Background of Respondents

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	220	53.4
	Female	252	46.6
Age	Under 20 years' old	59	12.5
	20 to 30	244	51.7
	31 to 40	104	22
	41 to 50	40	8.5
	Over 51 years old	25	5.3
Education	Primary school	12	2.5
	Diploma	160	33.9
	Associate degree	44	9.3
	Bachelor's degree	141	29.9
	Master's degree	101	21.4
Respondents' latest smartphone brands	Doctorate	14	3
	Samsung	190	40.3
	Xiaomi	105	22.2
	iPhone	86	18.2
	Huawei	50	10.6
	Nokia	29	6.1
Sony	12	2.5	

The present study's questionnaire is composed of 26 inquiries and divided into two parts, with the first part comprising six questions that aim to collect demographic information, including age, gender, education, and respondents' latest smartphone brands. Result of this part demonstrated on table 1. The second section comprises 20 questions that evaluate the research variables. In order to assess brand gender, an independent variable in this research, Grohmann's (2009) Brand Gender Personality dimensions were employed. This scale encompasses 12 components and 12 inquiries were developed using it, with six questions gauging the brand's femininity and six questions evaluating the brand's masculinity using a five-point Likert scale: 1. Very low 2. Low 3. Moderate 4. High 5. Very high. This scale has been validated repeatedly and is reliable, valid, and invariant for humans and brands across different countries and cultures (Lieven, 2022). We utilized the Machado et al., 2019 questionnaire to measure brand equity, a dependent variable in this study. This questionnaire assesses brand equity using three questions on

a five-point Likert scale: 1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree. The Vakas Carvalho et al., 2020 questionnaire measures the brand's loyalty level using four questions designed on a five-point Likert scale: 1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree was utilized to evaluate customer loyalty, a mediating variable in this study.

Data analysis

Based on normal distribution of data, we utilize parametric methods to explore the relationships between research variables and to test hypotheses. The statistical inference technique was employed to evaluate the research hypotheses. We used SPSS version 26 and Smart PLS version 3 software for data analysis. Considering the normal distribution of the frequency of research variables, independent parametric analysis of variance tests was employed to scrutinize different hypotheses. Pearson correlation and independent t-tests were utilized to evaluate relationship hypotheses. Ultimately, structural equation modeling was employed to investigate the role of mediating variables.

Results

The questionnaire utilized in this study is a combination of standardized questionnaires from previous research, ensuring content validity. We invested dedicated efforts to guarantee the precision of questionnaire translation from English to Persian and the audience's understanding of the inquiries. Thus, the employed scale appropriately measures the assessed concept, and the questionnaire exhibits content validity. In order to verify the research tool's ability to ascertain what it claims to measure, the supervisor and a panel of experts scrutinized the research questionnaire for face validity. After we addressed their comments, it was approved. Additionally, we utilized the extracted mean and variance criterion to assess the convergent validity. The results are presented in Table 2.

Table 2. Average Variance Extracted (AVE)

Variables	Average Variance Extracted (AVE)
Femininity of brand	0.618
Masculinity of brand	0.657
Customer loyalty	0.785
Brand equity	0.799

The table 2 illustrates that the extracted variance for all structures displays an average value that surpasses the threshold of acceptability, which is 0.5. From this observation, the research model possesses a degree of satisfactory validity. In order to evaluate the reliability of the questionnaire, this study employed Cronbach's alpha coefficient and composite reliability coefficient, the outcomes of which are provided in Tables 3 and 4.

Table 3. Cronbach's alpha coefficients

Variables	Cronbach's alpha value
Brand femininity	0.876
Brand masculinity	0.895
Customer loyalty	0.908
Brand equity	0.873

Table 4. Composite Reliability Coefficient(CR)

Variables	CR
Brand femininity	0.906
Brand masculinity	0.920
Customer loyalty	0.936
Brand equity	0.922

As the tables 3 and 4 show, Cronbach's alpha and composite reliability coefficient values for all constructs surpass the acceptable threshold of 0.70. Hence, the research model exhibits satisfactory reliability.

In order to achieve a more thorough comprehension of the research population and to establish greater familiarity with the research variables, it is imperative to provide a clarified description of the data before conducting any statistical analysis. Consequently, before testing the research hypotheses, the descriptive statistics of the variables utilized in the study were examined. The mean is the main parameter representing the population's center of gravity. If the mean is used instead of all observations within the population, no changes will occur to the overall population data. Furthermore, the maximum indicates the highest value of the variable within the statistical population, while the minimum represents the lowest value of the variable within the statistical population. The findings of the descriptive statistics are displayed in Table 5.

Table 5. Descriptive statistics of research variables

Variables	Sample size	Average	Standard deviation	The least	The most	Skewness	Kurtosis
Brand femininity	472	20/67	4/885	6	30	-0.360	-0/020
Brand masculinity	472	20/93	5/238	6	30	-0.368	-0.388
Customer loyalty	472	14/30	4/354	4	20	-0.350	-0/901
Brand equity	472	11/07	3/080	3	15	-0.514	-0.626

As evidenced in the table 5, the mean response of individuals towards the brand femininity index is 20.67, towards the brand masculinity index, is 20.93, towards the customer loyalty index is 14.30, and towards the brand equity index is 11.07. Moreover,

to scrutinize the data's normality, the coefficients of skewness and kurtosis are employed. Skewness denotes the symmetry or asymmetry of the distribution function, whereas kurtosis signifies the height of a distribution function. According to (Hussain et al., 2018) and (Jin, 2014) as the values of skewness and kurtosis fall within the range of -2 to +2, it is indicative of the normal distribution of the data.

Parametric tests for testing hypotheses 1-7

Analysis of variance test is used for hypothesis 1. In this section, we will conduct a one-way analysis of variance test to examine the difference in the average masculinity and femininity variables across various clusters of smartphone brands.

Table 6. Comparison of average brand femininity in different smartphone brands

Groups	Sample size	Mean	standard deviation	F statistic	Significant level
Samsung	190	21/04	4/174	17/949	0.001
Xiaomi	105	17/84	4/682		
iPhone	86	23/84	3/534		
Nokia	29	19/52	5/248		
Huawei	50	20/10	5/877		
Sony	12	22/25	5/446		

Table 6 indicates that the significance level for comparing the mean femininity index variable across various groups of smartphone brands falls below the 0.05 threshold. Consequently, it can be inferred that H1 is endorsed at a confidence level of 95%. It can be deduced that there is a difference in the mean femininity index variable among various smartphone brands.

Table 7. Femininity index of the brand from the highest to the lowest based on average

Brands based on femininity	Mean
iPhone	23/84
Sony	22/25
Samsung	21/04
Huawei	20/1
Nokia	19/52
Xiaomi	17/84

Table 8. Comparison of average brand masculinity in different smartphone brands

Groups	Sample size	Mean	standard deviation	F statistic	Significant level
Samsung	190	20/49	4/750	6/144	0.001
Xiaomi	105	19/64	5/304		
iPhone	86	23/41	4/773		
Nokia	29	21/41	4/387		
Huawei	50	20/32	6/169		
Sony	12	22/58	7/354		

Based on the results demonstrated in Table 8, it is evident that the level of significance associated with the comparison of the mean masculinity index variable across various groups of mobile phone brands is less than 0.05. Consequently, we can confidently accept that at a 95% confidence level there is a significant difference in the mean masculinity index variable among diverse smartphone brands.

Table 9. Masculinity index of the brand from the highest to the lowest based on average

Brands based on masculinity	Mean
iPhone	23/41
Sony	22/58
Nokia	21/41
Samsung	20/49
Huawei	20/32
Xiaomi	19/64

Correlation test is used for hypothesis 2. This section uses a Pearson correlation test to examine the relationship between the femininity index and customer loyalty. The results of the test can be seen in Table 10.

Table 10. The result of the correlation test of the second hypothesis

		Brand femininity
Customer loyalty	Correlation coefficient	0.667
	significant Level	≤ 0.001
	Sample size	472

Table 10 presents a 95% confidence level for the test, with a significance level of less than 0.05. The Pearson correlation test reveals a positive correlation between the femininity index and customer loyalty and is classified as moderate as the categorization of correlation levels proposed by (Schober et al., 2018) Similar to hypothesis 2 Pearson's correlation test was used to investigate the relationship between brand masculinity and loyalty in third hypothesis. The test results can be seen in Table 11.

Table 11. The result of the correlation test of the third hypothesis

		Brand masculinity
Customer loyalty	Correlation coefficient	0.618
	significant Level	≤ 0.001
	Sample size	472

Based on the data presented in Table 11, the test is significant at the 95% confidence level. The correlation test results show a positive relationship between brand masculinity and consumer loyalty, considered moderate intensity based on the classification of correlation presented by (Schober et al., 2018). An Independent t-test was used to examine the relationship between customer sex and loyalty in fourth hypothesis. The test results can be seen in Tables 12 and 13.

Table 12. Descriptive indices of the of the investigated variables

Variable	Sex	Sample size	Mean	Standard Deviation	standard error
Customer loyalty	Women	252	14.27	4/346	0.274
	Men	220	14.23	4/372	0.295

Table 13. Comparing the average score of the loyalty index between men and women

Variable	Sex	Mean	T statistic	Degrees of freedom	significant Level
Customer loyalty	Women	14.27	-0.144	470	0.885
	Men	14.23			

Based on the presented results, it can be concluded that the aggregate loyalty index score for female users stands at 14.27, while for male users, the score is 14.33. Moreover, the test's significance level of 0.885, more significant than 0.05, suggests a lack of statistical significance in the difference between the loyalty scores of male and female users. Therefore, the hypothesis positing a correlation between customer gender and brand loyalty across various smartphone brands is deemed unsupported and must be rejected. For testing sixth hypothesis we used an independent t-test to investigate the relationship between the customer's sex and the perception of brand femininity. The test results can be seen in Tables 14 and 15.

Table 14. Descriptive indices of the variables investigated in the sixth hypothesis

Variable	Sex	Sample size	Mean	Standard Deviation	standard error
Brand femininity	Women	252	20.52	4.931	0.311
	Men	220	20.85	4.837	0.326

Table 15. Comparison of the average brand femininity score between men and women

Variable	Sex	Mean	T statistic	Degrees of freedom	significant Level
Brand femininity	Women	14.27	-0.732	470	0.464
	Men	14.23			

According to the findings presented in the tables 14 and 15, the total score of the brand femininity index among female users is equivalent to 20.52. Similarly, among the male users, the score is 20.85. Notably, the significance level of the test is 0.464, which is greater than the accepted level of 0.05. The mentioned result suggests no statistically significant difference in brand femininity scores between male and female users. Therefore, the hypothesis proposing a relationship between customer sex and brand femininity perception in different mobile phone brands is rejected. Similar to hypothesis six we used an independent t-test to investigate the relationship between the customer's

sex and the perception of brand masculinity for the seventh hypothesis. The test results can be seen in Tables 16 and 17.

Table 16. Descriptive indices of variables investigated in the seventh

Variable	Sex	Sample size	Mean	Standard Deviation	standard error
Brand masculinity	Women	252	20.71	5/214	0.328
	Men	220	20.18	5/267	0.355

Table 17. Comparison of the average brand masculinity score between men and women

Variable	Sex	Mean	T statistic	Degrees of freedom	significant Level
Brand masculinity	Women	20/71	-0.975	470	0.330
	Men	21/18			

According to the tables' outcomes 16 and 17, the aggregate score of the brand masculinity index among male users is 20.71, and among female users is 21.18. Furthermore, the test's significance level is 0.330, more significant than the standard value of 0.05. Therefore, it is evident that there is no statistically significant difference in brand masculinity scores between male and female users. Consequently, the hypothesis of a connection between customer sex and the perception of brand masculinity in various smartphone brands is rejected.

Structural equation method for testing hypotheses 8-9

The structural equation modeling method was used to test hypotheses 8 and 9, which measure the mediating effect of a variable. The findings of the investigation are presented as follows:

Based on the figure 2, it is evident that the questionnaire items' factor loadings exceed 0.4, signifying that the indicators accurately reflect the given construct. Moreover, upon analyzing the coefficient of determination obtained for the brand equity indicator (0.628), it can be inferred that brand loyalty, brand masculinity, and femininity collectively account for 62% of the variation in brand equity. Correspondingly, the coefficient of determination for the brand loyalty indicator stands at 0.506, implying that brand masculinity and femininity jointly explain 50.6% of the variation in brand loyalty.

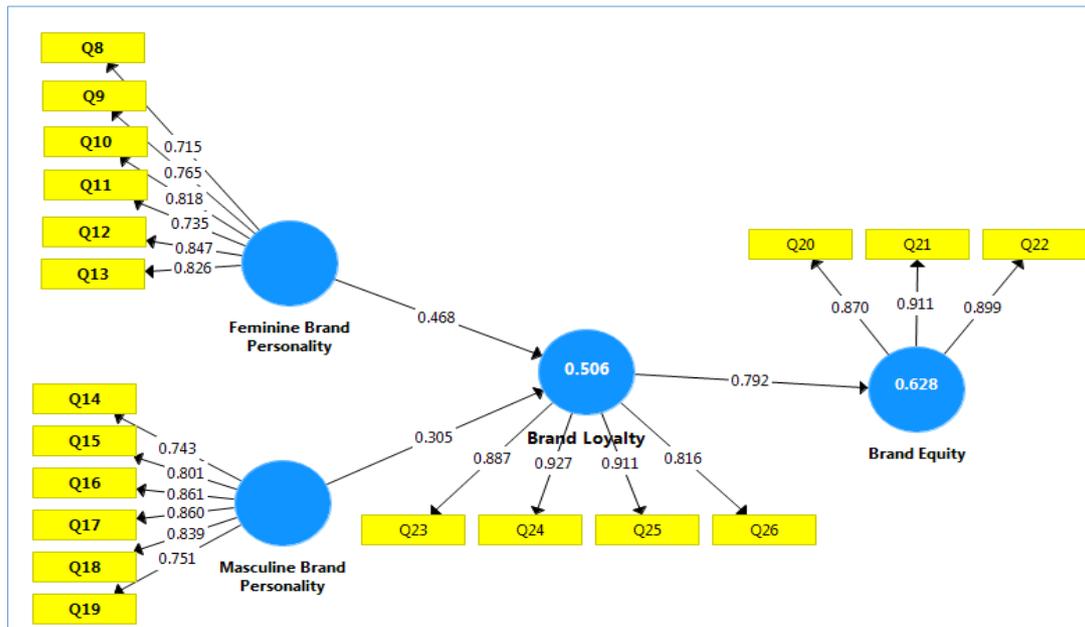


Figure 2. Regression coefficients model

Considering the utilization of Smart PLS software, the t-value serves as an instrument to evaluate the importance of relationships. This value holds a significance of 1.96 when measured at a 5% level. Consequently, a comparison of the t-value to 1.96 is necessary to determine the significance of relationships. If the t-value surpasses this predetermined value, the relationship assumes significance. Upon inspection of the diagram 3, it becomes evident that all t-values surpass 1.96, indicating that each relationship within the model is significant.

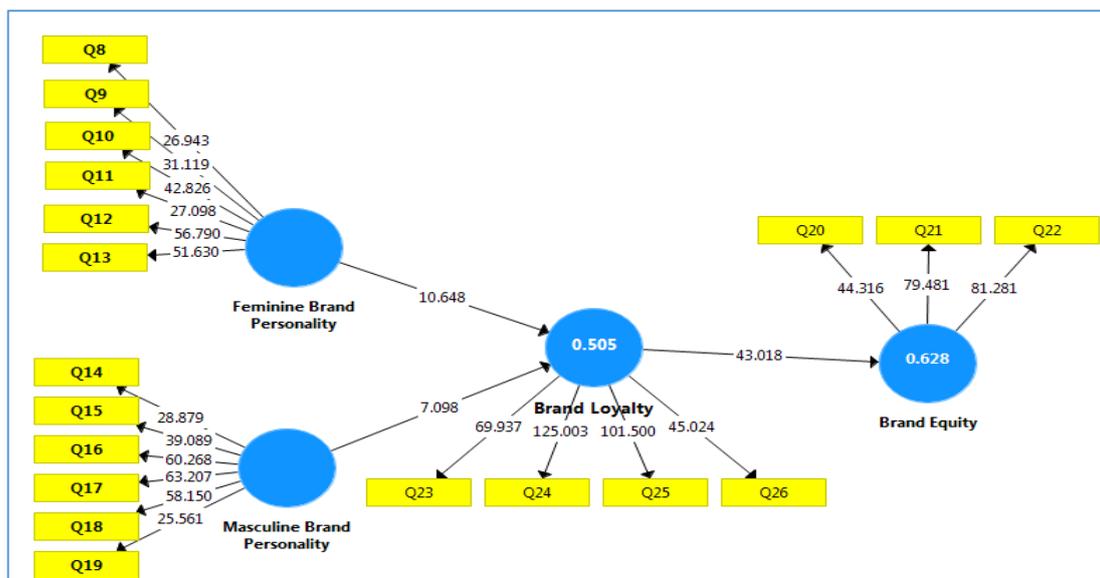


Figure 3. T-statistic value model

Table 18. Regression coefficients of direct effects

The path of relationships	Regression coefficient	standard deviation	T statistic	significant Level
Brand loyalty → Brand equity	0.792	0.019	43.018	≤0.001
Brand masculinity → Brand loyalty	0.304	0.044	7.098	≤0.001
Brand femininity → Brand loyalty	0.468	0.045	10.684	≤0.001

According to Table 18, the regression coefficient for Brand Loyalty concerning Brand equity is 0.792, and its significance level is below the threshold of 0.05. Thus, the study's results suggest that Brand Loyalty positively and substantially impact Brand equity. Furthermore, it is notable that the regression coefficient for Brand Masculinity concerning Brand Loyalty is 0.305, and its significance level is below 0.05. Hence, based on the research findings, Brand Masculinity also positively and significantly influences Brand Loyalty. Similarly, the regression coefficient for Brand Femininity concerning Brand Loyalty is 0.468, and its significance level is below 0.05. Therefore, based on the study's findings, Brand Femininity also positively and significantly impacts Brand Loyalty.

Table 19. Regression coefficients of indirect effects

The path of relationships	Regression coefficient	standard deviation	T statistic	significant Level
Brand masculinity → Brand loyalty → Brand equity	0.241	0.035	6/812	≤0.001
Brand femininity → Brand loyalty → Brand equity	0.371	0.037	10/002	≤0.001

As per Table 19, the regression coefficient for the influence of Brand Femininity on Brand equity via Brand Loyalty is 0.371, and its significance level is below 0.05. Hence, Brand Femininity has a discernible effect on brand equity through customer loyalty in diverse smartphone brands. Consequently, Hypothesis 8 is validated. Furthermore, the regression coefficient for the influence of Brand Masculinity on Brand equity via Brand Loyalty is 0.241, and its significance level is below 0.05. Thus, Brand Masculinity also impacts brand equity through customer loyalty in different smartphone brands. As a result, Hypothesis 9 is also established.

Discussion

Through an examination of the literature, it has come to light that in recent years, the gender brand model has gained considerable attention in marketing and international brand development strategies. The literature further asserts that international company managers have long sought to identify a universal model to amplify brand value across cultures and countries. Ultimately, utilizing the Grohmann Gender Model 2009 has emerged as one of the most effective means for achieving this objective. Despite a recent surge in attention, gender branding research has predominantly focused on individualistic cultural countries. Regrettably, little research on this topic has been conducted in Iran, considered as a collectivist culture country according to Hofstede's scale. The results of such research can be highly beneficial to international brand managers who aim to

augment the value of their brands in collectivist countries. The first hypothesis was evaluated twice, once for the brand femininity index and once for the brand masculinity index. The outcomes of both tests, at the 95% confidence level, demonstrate that the significance of the test is less than 0.05, thereby affirming the first hypothesis. It can therefore be deduced that variations in masculinity and femininity exist among diverse smartphone brands. The results reveal that users of varied smartphone brands possess distinct perceptions of the masculinity and femininity of the brands they employ. For instance, according to the average tables, the iPhone brand is simultaneously represented by a high degree of feminine characteristics and masculine characteristics by users, signifying that the iPhone brand is an androgynous brand (very masculine, very feminine) as perceived by Iranian users. The results of this investigation are in agreement with (Lieven & Hildebrand, 2016) observation that androgynous brands develop brand equity across all countries, and consequently, an androgynous brand position can be a vital concept in a thriving standardized strategy. On the other end of the spectrum, in this research, the Xiaomi brand is located at the end of this spectrum, i.e. it has a low level of feminine brand characteristics and masculine brand characteristics, which is perceived as an undistinguished brand (less masculine, less feminine) among users. The result of hypothesis two shows a positive relationship between brand femininity and customer loyalty in different mobile phone brands, which means that the more feminine the brand is perceived to be, the more loyal customers will be. The result of testing the third shows a positive relationship between brand masculinity and customer loyalty in different mobile phone brands, which means the more masculine the brand is perceived to be, the more loyal customers will be. The findings suggest that feminine and masculine brand identities can increase customer loyalty, with stronger gender identities potentially leading to higher brand loyalty. Therefore, brands need to create either a highly feminine or masculine identity to appeal to customers and improve loyalty. The results of hypotheses two and three are consistent with (Vacas de Carvalho et al., 2020) finding that a strong gender identity increases brand loyalty. The results of the fourth hypothesis indicate no significant relationship between customer sex and loyalty among different mobile phone brands. The findings suggest that customer sex does not impact brand loyalty in the context of mobile phone brands. Both male and female customers showed similar levels of loyalty to the brands, indicating that gender is not a determining factor in how loyal customers are. These results contradict previous research that found gender differences in brand loyalty; however, the context of mobile phone brands appears to reduce or eliminate such differences. In summary, mobile phone brands should not tailor their marketing strategy and communications based on the sex of their customers as it does not affect their loyalty. Other factors seem to be more important drivers of loyalty for these brands. As a result of testing the fifth hypothesis, a relationship exists between customer loyalty and brand equity in mobile phone brands. Additionally, the correlation coefficient obtained from the test of this hypothesis indicates a strong correlation between customer loyalty and brand equity. In other words, as customer loyalty increases, it increases brand equity in mobile phone brands. The results of this hypothesis are consistent with the study by (Knox & Walker, 2001), which suggests that loyalty to a brand is a crucial variable in increasing brand equity. The test results of hypothesis sixth represent that this hypothesis is rejected, which means that customer sex does not impact the perception of femininity in mobile phone brands among users. In other words, male and female users are similar in their perception of the level of femininity in mobile phone brands. The outcomes from the experimentation of hypothesis seventh have demonstrated

the rejection of this hypothesis, which means that customer sex does not impact the perception of masculinity in mobile phone brands among users. In other words, male and female users' perceptions of masculinity in mobile phone brands are similar. The results of the sixth and seventh hypothesis tests are similar to the study by (Lieven et al., 2014) which points out that consumers' preference for highly gendered brands is independent of their gender. The eighth hypothesis tested in this statement examines the impact of brand femininity on brand equity through customer loyalty in various mobile phone brands. The study used the structural equation modeling method to analyze the data and examine the relationship between these variables. The findings demonstrate that the regression coefficient about the effect of brand femininity on brand equity, mediated by brand loyalty, is 0.37, meaning that brand femininity significantly impacts brand equity through customer loyalty. As mentioned, results suggest that customers loyal to a brand with feminine characteristics perceive the brand as having higher value and quality. The study concludes that brand femininity is essential in developing and maintaining brand equity in the mobile phone industry. It is worth noting that this hypothesis is examined for the first time in this study, which adds to the existing literature on brand equity and brand gender in marketing. Overall, the study provides valuable insights for marketers and researchers to understand the role of brand femininity in developing brand equity in the mobile phone industry. The ninth hypothesis tested in this statement examines the impact of brand masculinity on brand equity through customer loyalty in various smartphone brands. Like the previous hypothesis, the study used the structural equation modeling method to analyze the data and examine the relationship between these variables. The regression coefficient for the effect of brand masculinity on brand equity, mediated by brand loyalty, is 0.24, indicating that brand masculinity significantly impacts brand equity through customer loyalty. It means that customers loyal to a brand with masculine characteristics perceive it as having higher value and quality. The study concludes that brand masculinity is essential in developing and maintaining brand equity in the smartphone industry. Like the previous hypothesis, this hypothesis is also examined for the first time in this study, adding to the existing literature on brand equity and brand gender in marketing. The findings of this study have implications for marketers and researchers in understanding the role of brand masculinity in developing brand equity in the smartphone industry. In summary, the primary concern of this study was how to raise the unique value of global smartphone brands in Iran's competitive market. As mentioned in literature loyalty is an important variable affecting brand equity and plays a crucial role in choosing smartphones (Kim et al., 2020). On the other hand, we discovered that one of the most effective methods for boosting brand equity across cultural boundaries is the application of the Gender Model. For the first time, in this study the effect of brand gender was examined as a significant factor in strengthening brand equity through the mediating variable of loyalty in the smartphone industry, and the findings demonstrated that increasing the femininity or masculinity of smartphone brands can improve brand equity. The role of Loyalty was significant as a mediator in this relation. In addition, the important point is that the increase in brand equity due to the femininity of the brand is more effective and has a higher coefficient compared to the masculinity of the brand. This could be attributed to the collectivist culture of Iranian society, which also enhances the literature as well. Lastly, in collectivist cultures in the smartphone industry, an increase in femininity can result in a higher brand value compared to an increase in masculinity.

Managerial implication

Marketing managers can influence customers' perception of brand gender through touchpoints with customers: Touchpoints refer to any point of contact between a customer and a brand, such as advertising, social media, customer service, packaging, etc. Marketing managers can use these touchpoints to convey gender-related messages and symbols that shape customers' perceptions of brand gender. Due to the more significant impact of brand femininity on customer loyalty compared to brand masculinity, marketing managers can increase customer loyalty by increasing brand femininity. This statement suggests that in the mobile phone industry, customers are more loyal to brands perceived as more feminine. Therefore, marketing managers can increase customer loyalty by incorporating feminine features into their branding strategies, such as using softer colors and curvier designs or emphasizing the phone's camera and selfie-taking capabilities. Brand managers should clarify their position in gender differentiation and adopt a suitable strategy to shape their brand gender to enhance brand equity and customer loyalty. However, not all brands are easily distinguishable, so marketing managers should adopt a suitable strategy to shape their brand gender and improve brand equity. Sex segmentation of the market may not be necessary for the mobile phone industry, as there is no significant difference in the perception of brand gender between men and women. Therefore, marketing managers may not need to tailor their branding strategies based on the gender of their target audience but instead, focus on creating a distinct and appealing brand identity that resonates with all customers.

Limitations of research

In every scientific research, limitations may slow down the research process or hurt obtaining the desired results. The current research is not exempt from limitations, and the most critical limitations of this study are as follows. The current research was conducted using a brand gender questionnaire based on a non-Iranian culture. Therefore, what the researcher is investigating based on other countries' research may have a different meaning for Iranian respondents. However, we tried considering the respondents' perspective in translating the questionnaire and we attempted to correct the deviations made in previous translations of the brand gender questionnaire in other studies. In order to ensure accuracy and comprehensibility, we sought assistance from supervisors and resolved any existing issues. Due to the time-consuming nature of collecting questionnaires, this research faced time constraints. Like other research studies that use questionnaires, this research has inherent limitations of the questionnaire.

Further research

Future researches should consider the price factor of smartphone brands in brand selection to gain a more comprehensive understanding of brand selection and customer loyalty. Additionally, besides the biological sex of consumers considering gender identity in the research model can help understand consumer perceptions. Extending the research to include other smart products of the same brand can also help gain a more comprehensive understanding of brand perception. Results from these studies in the future can be compared to current research to identify similarities and differences in brand gender perception and brand equity across different products of the same brand. Also

researches targeted on exploring determinants of brand gender can be developed. Overall, these recommendations for future researches provide insights for marketing managers in developing effective branding strategies.

Conclusion

The study's findings indicate that users of different smartphone brands have varying perceptions of brand masculinity and femininity. Some brands are seen as more masculine, while others are perceived as more feminine. Furthermore, the study established a strong relationship between brand gender (i.e., brand masculinity and brand femininity) and customer loyalty; results also demonstrate that the impact of brand femininity on customer loyalty is more significant than the effect of brand masculinity on customer loyalty. Consequently, the outcomes of this study suggest that enhancing the feminine aspects of brand results in greater brand loyalty, possibly due to the collectivist culture in Iran. In addition, the study explored whether customer sex influences their perception of brand masculinity and femininity in smartphone brands. The results showed no significant relationship between customer sex and their perception of brand gender. This consequence may be because both men and women use mobile phones to a similar extent, and thus, sex may not be a significant factor in their perception of brand gender in this product category.

Moreover, the study investigated the impact of increasing customer loyalty on brand equity in smartphone brands. By using brand masculinity and femininity as independent variables and brand equity as the dependent variable, the study found that loyalty can account for 62.8% of the variance in brand equity by increasing brand masculinity and femininity. Therefore, the study suggests that utilizing features that enhance brand masculinity and femininity to influence customer loyalty can augment brand equity. Overall, this study provides valuable insights into the role of brand masculinity and femininity in developing brand equity and customer loyalty in the smartphone industry. The findings suggest that companies can enhance brand loyalty and equity by incorporating gender-related characteristics into their branding strategies. Future research could explore this topic in diverse cultural contexts to gain a more comprehensive understanding of the impact of brand gender on brand equity and customer loyalty.

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