

The Mediator Role of Brand Image in the Effect of Product Knowledge on Brand Loyalty: A Study on Mobile Phone Brands

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Abstract: *The objective of this study is to explore the relationships between product knowledge, brand image, and brand loyalty in the mobile phone brands context. Specifically, the study investigates the effect of product knowledge level on brand image and brand loyalty, the effect of brand image on brand loyalty, and how brand image mediates the effect of product knowledge on the brand loyalty of mobile phone users. The participants of the study were mobile phone users in the prominent cities of Turkey. A total of 426 participants were identified with the utilization of convenience sampling methodology and the data collection process was executed through a questionnaire distributed electronically. The results of the study confirmed the direct positive and significant effects of the product knowledge level of consumers on brand image and brand loyalty. On the other hand, the image perception of consumers regarding the mobile phone brand is found to have a significant and positive direct effect on brand loyalty. When brand image is included in the model as a mediating variable, the direct effect of product knowledge on brand loyalty turns into an insignificant one, which confirms the mediating role of brand image on the effect of product knowledge on brand loyalty.*

Keywords: Brand Image, Product Knowledge, Brand Loyalty, Consumer Behavior, Consumer Electronics

JEL: M30, M31, M39

Received : 23 April 2024
Revised : 07 June 2024
Accepted : 14 June 2024

Type : Research

1. Introduction

In the contemporary consumer markets, brands compete in extensively competitive market conditions full of competitors who struggle to gain shares in the minds and hearts of consumers to acquire and retain them for generating long-term and profitable relationships bringing increased wallet shares. However, realizing such objectives is becoming harder as the number of competitors are rising, the available options for consumers are abundant and their standards as well as expectations are at the highest point since ever. Average number of ads each consumer is exposed every single day increased from five hundred to five

Cite this article as: Rhazaoui, Y., Sözer, E. G., Civelek, M. E., & Ertemel, A. V. (2024). The mediator role of brand image in the effect of product knowledge on brand loyalty: A Study on mobile phone brands. *Business and Economics Research Journal*, 15(3), 211-227. <http://dx.doi.org/10.20409/berj.2024.442>

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thousand in 2017, and it reached at more than six thousand commercial messages a day as of 2021 (Carr, 2021). Thus, it became extremely difficult to attract the attention of consumers in the cluttered environment, to convince them with an offer, and to retain the relationship in this competitive environment. The strength of the relationship between consumers and brands are dependent on several cognitive and affective factors including physical and psychological needs of consumers, physical attributes of brand and products as well as the perception of consumers related to the symbolic values provided by the brands (Hankinson & Cowking, 1993). The dynamics of consumer decision making process, which leads to the decision to sustain or drop the relationship with the brand, becomes more and more complex. Previous studies in the literature, which focused on the direct determinants of the brand loyalty, reported a direct, positive and also significant effect of customer experience and customer satisfaction on customer loyalty as the leading factors (Anderson & Mittal, 2000; Bleier et al., 2019; Molinillo et al., 2022). However, consumer decision regarding the continuation of the relationship between the brand and customer may also a product of other interrelated factors including the perceptions of consumers related to the image congruency between the brand, product, and consumer (Ataman & Ülengin, 2003) as well as their level of product knowledge (Alba & Hutchinsons, 1987). This study focuses on the impacts of product knowledge on brand image perceptions and brand loyalty behavior of consumers and the mediating role of the brand image on the effect of product knowledge on brand loyalty. The study contributes to the marketing literature by focusing on the mediating role of the product knowledge in the relationship between the brand image and brand loyalty. The investigation of this unexplored area of product knowledge, brand image and brand loyalty relationship is the novelty provided by this study.

In the following section, the conceptual and theoretical framework of the study is presented by focusing on the brand image, product knowledge and brand loyalty constructs as well as the explanation of the underlying theoretical and empirical grounds leading to the development of research model and hypothesis to be tested in the study. In section three, the research methodology of the study is presented including sampling and data collection procedures as well as data analysis methodology. The results of the analysis including the presentation of the hypothesis testing are presented in section four. In the final section, academic and managerial implications of the results are explained. Academic implications are presented by comparing the findings with the existing theoretical framework as well as the findings of the previous studies in the literature. Managerial implications are provided with the translation of the findings to the applications in the brand management practices.

2. Literature Review and Hypothesis Development

2.1. Brand Image

Based on the associative networks model of knowledge formation and activation, information related to some concepts is stored in the memory of human beings at specific locations and some associative pathways are employed to relate this information to each other (Wyer & Carlston, 1979). As it is explained by spreading activation model, when something comes to a mind of a person, that knowledge unit in the memory is activated and the activation spreads to other units in the knowledge structure through the associative pathways (Collins & Loftus, 1975). Thus, the knowledge related to the brands can be regarded as a function of nodes and links of several primary and secondary associations related to the brand (Keller, 1993). When the excitation reaches an adequate level of strength at one unit of node, that node is also activated and the excitation continues to spread to other linked nodes through the associative pathways. As a result of this process, the information required to make a decision is transferred into the working memory of the person (Anderson, 1983).

The totality of the associations connected to an entity in consumer memory generates the overall perception of the consumer related to that entity. In line with the associative networks model of knowledge formation and activation, the concept of brand image was first conceptualized and introduced by Gardner and Levy (1955). As explained by Paivio (1969), the image can be regarded as a mental representative of the meaning related to something and the combined impact of the whole tangible and intangible associations

linked to the brand is called as brand image (Engel et al., 1993). Many studies conceptualized brand image from different perspectives including its meaning, personal relevance as well as the cognitive and psychological elements embedded into the construct. Several studies provided the definition of brand image as the totality of consumers' perceptions, impressions about the brand, and their opinion about its attributes and products (Dichter, 1985; Herzog, 1963; Newman, 1985). Other studies focused on the personal meaning of the brand image for consumers and defined the brand image construct as the symbolic meaning embedded in the products, services, and attributes of the brand (Levy, 1973; Noth, 1988; Sommers, 1964). Some other studies employed a self-concept and self-image approach and defined the brand image as the reflection of characteristics and personality of consumers (Sirgy, 1985; Martineau, 1957). The last group of studies focused on the cognitive and psychological aspects of the brand image and defined it as the totality of consumer opinions, attitudes and emotions towards the brand reflecting the cognitive and psychological aspects of the brand (Gardner & Levy, 1955).

Consumers develop an image of the brand in their memory through the collection, decoding, extracting and interpretation of signals transmitted by the brand as a result of the brand marketing activities (Kapferer, 1992). In turn, this signals lead to the formation of associations in consumer memory. When the associations related to the brand are positive, this leads to the formation of a strong brand image which eventually generates a positive impact on the brand equity (Aaker, 1991). Previous studies, which compared the brands with high and lower equity in terms of the associations, reported that higher equity brands are more likely to have positive associations than other brands (Krishnan, 1996). Thus, the formation and management of strong brand image is essential in brand management. Based on the image congruence model, consumers prefer the products of brands which are in line with their self-images, especially actual self and ideal self-images are the two key dimensions of self-image which are directly employed in the process (Sirgy, 1985). Previous studies in the literature confirmed the positive impact of image congruence on the attitudes of consumers towards the brands in different contexts and product categories (Belk et al., 1982; Hong & Zinkhan, 1995). Moreover, a strong brand image provides support for differentiating the products and services of the brand from its competitors, and it is the basis of the competitive advantage. This leads the image to overwrite the functional values with the symbolic ones imposed and the brand image plays an essential role in competition and sales (Murphy, 1990). Previous studies also confirm that strong images lead to the acceptance of premium prices by consumers and the preference of brands (Khrisnanda & Dirgantara, 2021; Kwon, 1990; Lassar et al., 1995). On the other hand, while a positive and strong brand image contributes to the consumer preference and sales, when the brand image is weak or vulnerable, then it may have negative consequences.

Overall, brand image is composed of knowledge about product, functional value benefits and consequences of using a brand and the personality of the brand (Plummer, 2000). The interaction of these three factors generates the overall perception of the consumers related to the brand. Brand image is an important factor playing role in consumer decision making process and eventually influences consumer behavior. Strong brand images support brands to differentiate from competition, generate competitive power and it is an important factor boosting market performance (Keller, 1993; Park et al., 1991).

2.2. Product Knowledge

Product knowledge is the totality of information consumers possess about a product category or a specific branded product. According to Brucks (1985), product knowledge is composed of memories and information related to the product. Lin and Chen (2006) define the three categories of product knowledge as perceived knowledge, objective knowledge, and experience-based knowledge. On the other hand, Alba and Hutchinson (1987), categorize the product knowledge structure into two, namely expertise and product familiarity. Thus, product knowledge is the product of previous experiences of consumer with the product category or a specific product, the information received through different channels as well the past exposures of consumer to the marketing efforts of the brands. This knowledge structure, which can be the composed of both declarative as well as procedural knowledge, is utilized by consumers along with other factors such as a brand image when there is a need to compare and evaluate the products in a purchase or usage situation.

The product knowledge is composed of intrinsic cues as well as extrinsic cues related to the product. Intrinsic cues are those which are directly related with the functional attributes of the products while extrinsic cues are those which are non-functional attributes and do not directly change the product features (Blair & Innis, 1996). As an example, brand image is one of the extrinsic cues of products which are employed by consumers in the decision-making processes.

The product knowledge of consumers is one of the key factors which play an important role in several stages of consumer decision making process (Bettman & Park, 1980). The level of product knowledge is expected to impact the result of the decision-making process. Previous studies, which focused on the effect of product knowledge level on the information processing and evaluation, confirmed this significant effect. When consumer have strong product knowledge structures, this leads to the formation of developed and complex schemata related to a product (Marks & Olson, 1981). On the other hand, when the product knowledge structure is weak, higher cognitive efforts are needed and evaluation capacity becomes lower compared to those having higher level of product knowledge. Stronger knowledge structures related to the product mitigate the risk of evaluation bias, and this leads to the increasing capacity and effectiveness of product evaluation (Bian & Moutinho, 2011). Thus, the level of product knowledge is expected to have a significant impact on the information search behavior of consumers (Rao & Sieben, 1992). In addition to its effects on the information search behavior, the level of product knowledge is also effective on the selections of consumers in the purchasing situations. When the product knowledge level is high and evaluation bias risk is mitigated, then the decision of consumer is expected to be less dependent to the extrinsic cues of the product, including image related components as well as other exposures. In their study, Lin and Chen (2006) investigated the effect of product knowledge, product involvement, and country of origin on the purchase intention of consumer in the insurance and catering services context and confirmed that consumers with higher level of product knowledge exhibit higher levels of purchase intentions. Similarly, Suki (2016) investigated the effect of product knowledge on purchase intention in the green branding context and confirmed the positive and significant effect of green product knowledge on the green product purchase intentions. Other studies in different context also confirmed the positive and significant influence of product knowledge on the purchase intentions of consumers (Nurhayati & Hendar, 2020). Overall, product knowledge is a multidimensional construct which reflects the awareness, familiarity and experience of consumers related to a product or product category (Cinjarevic et al., 2018). The level of product knowledge influences may dimension of consumer behavior including information search behavior, product evaluation, product preference as well as purchase intentions.

2.3. Brand Loyalty

Customer loyalty is one of the most explored concepts in the marketing literature and scholars focus on this concept since the first half of the twentieth century (Bhatnagar et al., 2017). As a general approach, customer loyalty reflects the attitudinal and behavioral state of consumers towards a brand, retailer, or an entity. Watson et al. (2015), in the meta-review of previous research in the field, defined brand loyalty as the totality of attitudes and series of purchasing behavior aligned together and directed to a particular entity. Thus, brand loyalty can be regarded as a long-term commitment to re-purchase of the offerings of a brand, company or to re-visit a retailer in the future (Oliver, 1999). Since customer loyalty and brand loyalty are used inter-changeably in the marketing literature, this study also applies the same approach and employs both terms inter-changeably. While the initial definitions of customer loyalty in the marketing literature were focused on the repeat purchases of a specific product, later studies categorized the dimensions of customer loyalty as being attitudinal, behavioral, and composite (Yoo & Bai, 2013). Marketing literature consists of large number of studies which are focused on the determinants of customer loyalty and these studies reported more than one hundred factors over the last four decades (Vaitone & Skackauskiene, 2020). Customer loyalty is the ultimate objective of customer relationship management process since loyal customers provide the comfort of long-term cash flow for the company through their repeat purchases as well as contribute to the brand performance by engaging into positive word-of-mouth behavior with other consumers in the community (Kitapci et al., 2014).

There is a large number of previous studies in the marketing literature which are focused on the determinants of customer loyalty. These studies can be grouped into customer related factors, brand related factors and market based factors. Customer related factors which are expected to influence the customer loyalty level include several demographic factors such as age, gender, income level as well as value-based ones such as the switching costs. Previous studies in the marketing literature reported differing levels of loyalty towards brands during the different life stages of consumers (Homjitr & Sato, 2017). In this perspective, older consumers show higher levels of loyalty propensity and resistance to change compared to younger consumers and young consumers show higher propensity to shift to other brands as they show less commitment to the brands (Anderson & Sharp, 2010; Srivastava, 2017). Previous studies also confirmed that male consumers exhibit weaker bonds and loyalty to brands compared to female consumers in several contexts (Kamath et al., 2019; Tweneboah-Koduah & Farley, 2016). Income level is also another demographic factor which impacts the level of loyalty behavior of consumers. For example, in the services context, due to the scarcity of options, low-income consumers exhibit higher level of brand loyalty (Orhan & Kaplan; 2018; Tasci, 2017). Switching costs, such as search costs, contract termination costs, set-up costs, benefit losses, and risks related to the new acquisition are those actual or perceived costs which can be incurred as a result of changing the brand, product, or service provider. When a perceived cost of switching from one brand to another is high, consumers become less motivated to switch their existing brand, product, or service provider (Li et al., 2018). In addition to the demographic factors mentioned below, there are also several brand related factors which play an important role on consumer loyalty behavior. Customer satisfaction which can be defined as the satisfactory or pleasurable consumption of a product or service (Oliver, 1999), is another factor which is directly influential on the customer loyalty level of consumers. Previous studies confirmed the positive effect of customer satisfaction on customer loyalty in different contexts (Al Amin et al., 2021; Koay et al., 2022; Slack et al., 2020). In the last couple of decades, many studies in the marketing discipline focused on the customer experience construct and its effects on consumer behavior. Customer experience, which can be defined as the cognitive, sensory, affective and behavioral reactions of consumers as a direct and indirect contact with a company, is one of the key factors which are effective in shaping customer satisfaction and loyalty. In their study, Başer et al. (2015) investigated the effect of customer experience on customer satisfaction and loyalty in four different product categories and reported a significant and positive effect of customer experience on both satisfaction and loyalty. Similarly, customer experience is found to have a significant and positive effect on customer loyalty through customer satisfaction in the online retailing context (Rose et al., 2012). Overall, customer loyalty and consequently the generation of customer equity, which can be realized through the satisfactory experiences of customers, is the ultimate objective of marketing efforts of all brands.

2.4. The Effect of Product Knowledge on Brand Image

The information possessed by consumers related to a product and the image of the associated brand are inter-related and connected mental formations. Brand image is the composition of many tangible and intangible associations which are directly and indirectly linked to the brand in the mind of consumer (Engel et al., 1993). Thus, brand image contains some information related to the brand which is already placed in the memory of consumers. On the other hand, product knowledge consists of information related to the product itself or the category of the product and it is the function of perceived knowledge, objective knowledge and experience-based knowledge related to the product (Lin & Chen, 2006). Thus, the product knowledge is one of the sources which make-up the brand image since the products which are offered by a brand are directly contributing to its associations in the memory of the consumer. Previous exposures to a product is expected to generate some familiarity of that product and when consumers' familiarity of the product increases, their ability to recall the product increases (Kent & Allen, 1994), perceived risk level decreases (Kim et al., 2019) and finally stronger familiarity leads to a stronger level of emotional associations in consumer memory (Kang et al., 2017). These cognitive and affective influences of knowledge formation are also supported by the mere exposure effect which is introduced and explained by Zajonc (1968). According to Zajonc, repeated exposure to a stimulus is expected to enhance the attitude towards the entity. This affective impact of knowledge generated through exposure is also confirmed in the meta-analysis of 134

studies conducted by Bornstein (1989). In this perspective, it is believed that when consumers will have higher level of knowledge structures related to a product, the positive effects of such familiarity and knowledge related to that product will be transferred to the associations of the owner brand of that product. Thus, in the light of the theoretical foundations as well as the findings of the previous literature, we propose the following hypotheses:

H₁: Increasing level of product knowledge will contribute positively to the brand image.

2.5. The Effect of Brand Image on Brand Loyalty

Brand image is one of the key factors which play an important role in the consumer decision making process. Associations related to the brand, which are acquired by consumer through exposure to the marketing efforts of the brand or through the direct experience with the products of the brand, lead to the formation of brand image (Keller, 1993). Brand image is inhibited in the mind of consumer through an associative memory network structure, and it leads to bias in brand evocation as well as evaluation (Kapferer, 1992). When the brand image is strong and positive, this is expected to lead to favorable consumer responses towards the brand and its products (Kwon, 1990). Thus, brand image can be regarded as an important asset of a company which directly influences purchase decisions of consumers (Grönroos, 2002). Previous research studies focusing on the effects of brand image on consumer behavior reported several important findings. In their study, Durmaz et al. (2018) investigated the effect of brand benefits and brand image on the loyalty of customers and reported the significant and positive effect of brand image on brand loyalty. Another study, which is conducted by Aslam et al. (2023) in the services context, focused on the impact of corporate social responsibility activities and corporate image on the customer loyalty. Authors of the study reported the significant effect of corporate image on customer loyalty in the banking industry. Chang (2021) conducted a study investigating the relationship between experiential marketing, brand image and brand loyalty in the retailing context. The results of the study confirmed the role of brand image mediating the effect of experiential marketing activities on the brand loyalty. In this perspective, it is believed that when a brand will have a well-known and positive image, this will support the brand to generate a loyal customer base. In the light of the theoretical foundations as well as the findings of the previous literature, we propose the following hypotheses:

H₂: The more positive is the brand image, the higher will be customers' level of brand loyalty.

2.6. The Effect of Product Knowledge on Brand Loyalty

Product knowledge is a critical factor which plays an important role in several stages of consumer decision making (Bettman & Park, 1980). One of these stages of decision-making process which is influenced by the level of product knowledge is the re-purchase situations. Product knowledge in consumer memory is formed as a function of familiarity and the direct experience with the product (Alba & Hutchinson, 1987). Thus, when consumers purchase a product and directly experience the consumption or usage process, this contributes to the knowledge base and product knowledge becomes stronger with additional associations in the memory. The impact of product knowledge level of consumers on their intention to re-buy the products of the brand can be explained on the basis of cost-benefit paradigm. Cost-benefit paradigm explains human behavior as a result of a trade-off calculation between the benefits or gains of an action and the costs associated with that particular action (Beach & Mitchell, 1978). When we apply the cost-benefit paradigm into the consumer behavior field, the trade-off calculation related to the benefits and associated costs of re-buying a product or switching to another brand determines the final decision of consumers. In this perspective, when the experiential factors leading to a satisfaction related to the product consumption are positive and constant, the level of product knowledge and familiarity is expected to generate a comfort zone for the customer to block the switching behavior since doing so will generate additional costs for the consumer in terms information search effort, sacrifices related to the time consumption as well as risks associated with the unfamiliar or less familiar options. Several studies in the literature focused on the effect of product knowledge level on customer loyalty or purchase intentions and the results of these studies support the theoretical foundations based on the cost-benefit paradigm. In their study, Xu et al. (2011)

investigated the effect of product knowledge on customer loyalty in the online services context and reported a positive and significant effect of product knowledge on customer loyalty. In addition to cost-benefit paradigm foundations, previous studies indicate that when consumers become more knowledgeable about a product, they rely more on objective information rather than external subjective information such as recommendations (King & Balasubramanian, 1994). Thus, purchasing a product is expected to lead to the formation of a stronger knowledge structure through direct experience and objective information acquisition. This will lead to the less reliance on external information sources such as recommendations and less sensitivity to competitive marketing efforts, which in turn, will eventually decrease the effect of competitive options, leading to the increase in the brand loyalty of the consumer. In the light of the theoretical foundations as well as the findings of the previous literature, we propose the following hypotheses:

H₃: Increasing level of product knowledge will contribute positively to the brand loyalty.

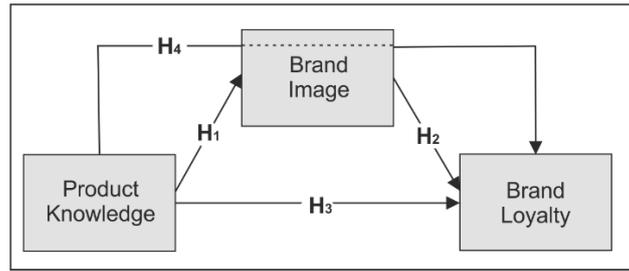
2.7. The Mediation Effect of Brand Image

The image of a brand is the combination of several primary and secondary tangible and intangible associations in the memory of consumer which collectively generate the meaning of that brand for the particular consumer through the associative networks model of knowledge formation and activation (Engel et al., 1993; Paivio, 1969). Thus, brand image can be regarded as the totality of consumer impressions, perceptions, and opinions (Newman, 1985), the symbolic meaning of the products or services (Levy, 1973; Noth, 1988), the reflection of characteristics and personality of the consumer (Sirgy, 1985; Martineau, 1957) as well as attitudes and emotions towards the brand reflecting the cognitive and psychological aspects of the brand (Gardner & Levy, 1955). On the other hand, product knowledge is the totality of information consumers possess about a product category or a specific branded product. Thus, it is composed of memories and information related to the product in the format of three types of knowledge, namely perceived, objective and experience-based knowledge (Lin & Chen 2006). Whatever is the format of product knowledge, the focal content is the functional and non-functional aspects related to the product in the memory (Blair & Innis, 1996). In this perspective, it can be stated that there is a parent-child relationship between brand image and product knowledge. In this inter-dependent relationship, when product information is updated, brand image is also supported. However, as the brand associations which are the basis of brand image involves anything linked to the brand in the memory (Aaker, 1991), product knowledge can be regarded as one part of the brand image formation. Thus, as the parent in this inter-dependent relationship, brand image, is expected to possess the potential of overwriting the impact of product knowledge on consumer behavior. This leads us to the consideration of a possible mediation effect of brand image on the effect of product knowledge on brand loyalty. It is believed that, due to the parent status of brand image, the significant and positive effect of product knowledge on brand loyalty may be overwritten by the mediating effect of brand image and the significant and positive effect of product knowledge on brand loyalty may become stronger, weaker or may turn into insignificant. In the light of the theoretical foundations as well as the findings of the previous literature, we propose the following hypotheses:

H₄: Brand Image will have a mediating role on the effect of product knowledge on brand loyalty.

The conceptual research model, which is developed based on the proposed hypothesis, shows the relationship between product knowledge, brand image and brand loyalty constructs and it is presented in Figure 1.

Figure 1. Conceptual Research Model



3. Research Methodology

3.1. Research Design and Sampling

This study was designed to explore the relationship between the product knowledge, brand image and brand loyalty in the consumer electronics context. Specifically, the effect of brand knowledge on brand image and brand loyalty, the effect of brand image on brand loyalty and the mediating effect of brand image on the effect of brand knowledge on brand loyalty was measured. The participants of this study were mobile phone users with different aged groups above 18 years old living in the prominent cities of Turkey including Istanbul, Ankara, İzmir and Antalya. The sample of the participants was identified based on the convenience sampling method and online survey links were distributed to the participants through e-mails and other applications. In order to conduct the field study, Ethics Committee approval was obtained on 14.02.2024. Participants were asked to fill out a questionnaire composed of demographic questions, mobile phone brand preference as well as statements related to the measurement of the product knowledge level, brand image perceptions and brand loyalty variables employed in the study. Questionnaires were prepared in the Google Forms application and distributed through the internet. A total of 426 valid surveys were collected with the support of personal, professional, and academic network of the authors. The demographic composition of participants is presented in Table 1.

Table 1. Demographic Composition of Participants

Gender	# of Participants	% of Participants
Male	148	35%
Female	278	65%
Total	426	100%
Age Group	# of Participants	% of Participants
18-24	115	16%
25-34	199	61%
35-44	87	17%
Other*	25	6%
Total	426	100%

*Other includes 45-54 (19 participants) and 55-64 (6 participants) age groups.

SPSS Statistics Version 29 was used for data management and basic statistical analysis. SPSS AMOS version 29 was used for conducting confirmatory factor analysis (CFA) to confirm the validity of the constructs and to test the hypothesis through the structural equation modelling.

The mediator role of brand image was detected by using the Baron & Kenny technique. Three models are derived according to the Baron and Kenny (1986) technique where the aim of this method is to reveal the mediator effect among the research model constructs. Firstly, validity of the constructs in the model have been determined by means of the confirmatory factor analysis (CFA). Subsequently structural equation modelling has been used to test the hypotheses in order to measures direct and indirect relationships within

a single model which reduces measurement errors (Anderson & Gerbing, 1988; Byrne, 2010; Fornell & Larcker, 1981; Meydan & Şen, 2011).

3.2. Operationalization of Variables

The scales of the variables employed in the conceptual research model are borrowed from the studies in the existing marketing literature. Product knowledge scale, which measures the knowledge level and familiarity of consumer about the related product in question, was borrowed from the studies of Lakshmanan and Krishnan (2011). Authors developed and validated the six items seven points product knowledge scale and reported a Cronbach Alpha score of 0.88, confirming its internal reliability. For the purpose of this study, three scale items from this original scale were employed and translated into Turkish. The scale was applied in the format of seven-points Likert type scale. The internal reliability testing yielded a Cronbach Alpha score 0.91, re-confirming the internal reliability of the scale. The scale and associated items employed for the Product Knowledge scale are presented in Table 2.

Table 2. Brand Knowledge Scale Items and Statements

Scale Item	Code	Scale Item Statement
Product Knowledge 1	PRK1	I have a high level of knowledge about X Branded Phone
Product Knowledge 2	PRK2	Compared to the rest of the population, my knowledge about X Branded Phone is very high
Product Knowledge 3	PRK3	I have a high level of knowledge about the X Brand

Brand Image scale, which measures the perception of consumer regarding the brand and its products in three dimensions, including functional image, affective image and reputational image, was borrowed from the studies of Pina et al. (2010). Authors employed and validated the brand image scale which is composed of functional, affective and reputational dimensions based on the existing literature (Aaker, 1996; Martin & Brown, 1990; Weiss et al., 1999). For the purpose of this study, all items of the scale from this original scale were employed and translated into Turkish. The internal reliability testing yielded a Cronbach alpha score 0.88, confirming the internal reliability of the scale. Finally, the brand loyalty scale, which measures the strength of the consumer's belief regarding the superiority of a brand and the cognitive attachment to it, was borrowed from the study of Wolter et al. (2017). Authors developed and validated the three items nine points brand loyalty scale and reported a Cronbach Alpha score of 0.83, confirming its internal reliability. For the purpose of this study, all scale items from this original scale were employed and translated into Turkish. The internal reliability testing yielded a Cronbach Alpha score 0.89, re-confirming the internal reliability of the scale. Both scales were applied in the format of five points Likert-type scales in the study. The brand image and brand loyalty scales and associated items employed in the study are presented in Table 3.

Table 3. Brand Image and Brand Loyalty Scale Items and Statements

Scale Item	Code	Scale Item Statement
Brand Image 1	BRI1	X Branded Phone is a high-quality product
Brand Image 2	BRI2	X Branded Phone has better characteristic than competitors
Brand Image 3	BRI3	The products of X Brand's competitors are cheaper
Brand Image 4	BRI4	X Branded Phone is a nice one
Brand Image 5	BRI5	X Brand has a personality that distinguishes itself from competitors
Brand Image 6	BRI6	X Branded Phone doesn't disappoint its customers
Brand Image 7	BRI7	X Brand is one of the best brands in the sector
Brand Image 8	BRI8	X Brand is a very consolidated one in the market
Brand Loyalty 1	BRL1	I consider myself loyal to X Brand
Brand Loyalty 2	BRL2	I prefer X Branded Phone over any of the alternatives
Brand Loyalty 3	BRL3	X Branded Phone is the superior choice

4. Findings

4.1. Construct Validity and Reliability

To determine the convergent validity, CFA was used (Anderson & Gerbing, 1988). Initially, principal component analysis has been performed to purify the items. Subsequently, confirmatory factor analysis (CFA) was conducted for the 11 remained items. CFA fit indices are found sufficient: $\chi^2/DF = 1.672$, CFI=0.992, IFI=0.992, RMSEA= 0.04. χ^2/DF indicates the obtained model fits the initial model. The factor loads obtained from CFA are shown in Table 4. Standardized factor loads have been bigger than 0.5 and significant (Civelek, 2018).

Table 4. Results of the Confirmatory Factor Analysis

Variables	Items	Standardized Factor Loads	Unstandardized Factor Loads
Brand Image (BRI)	BRI06	0.703	1
	BRI05	0.773	1.242
	BRI04	0.788	1.020
	BRI02	0.837	1.300
	BRI01	0.815	1.217
Product Knowledge (PRK)	PRK03	0.849	1
	PRK02	0.901	1.019
	PRK01	0.768	0.937
Brand Loyalty (BRL)	BRL03	0.862	1
	BRL02	0.920	1.149
	BRL01	0.867	1.033

$p < 0.05$ for all items

*Items BRI03, BRI07 and BRI08 were excluded due to the low factor loadings.

Convergent validity of the scales has been determined according to the CFA results. In order to confirm discriminant validity of the scales, Average Variance Extracted Values have been calculated for each construct and a comparison between AVE scores and values of correlation in the same column has been made in Table 5 (Civelek, 2018). The values in brackets represent the square root of the AVE scores for each construct. They are higher than the correlation values in each column. This means that discriminant validity of the scales was confirmed. Cronbach Alpha and composite reliability values are above the threshold (i.e. 0.7) (Fornell & Larcker, 1981) as shown in Table 5.

Table 5. Descriptives Statistics, Correlations and Reliability

Variables	1	2	3
1. Brand Image	(0.784)		
2. Product Knowledge	0.471*	(0.840)	
3. Brand Loyalty	0.596*	0.337*	(0.883)
Composite reliability	0.889	0.878	0.914
Average variance ext.	0.615	0.707	0.780
Cronbach α	0.882	0.875	0.913

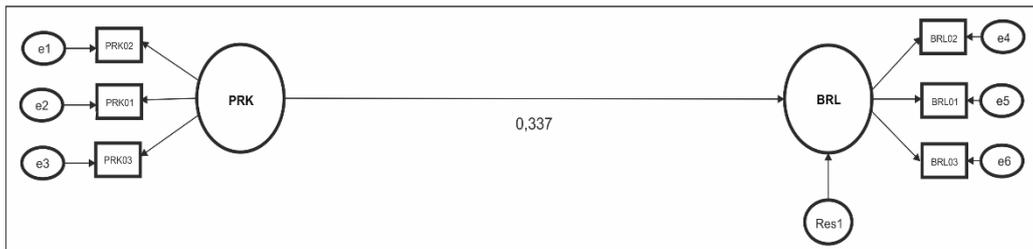
* $p < 0.01$; Note: Values in the bracket indicate the square root of AVEs.

4.2. Test of Hypotheses

The Baron and Kenny (1986) approach has been used to test research hypotheses. In order to use the Baron and Kenny approach, the coefficients of correlation between the variables must initially be significant (Baron & Kenny, 1986). This is necessary before conducting a mediator variable analysis.

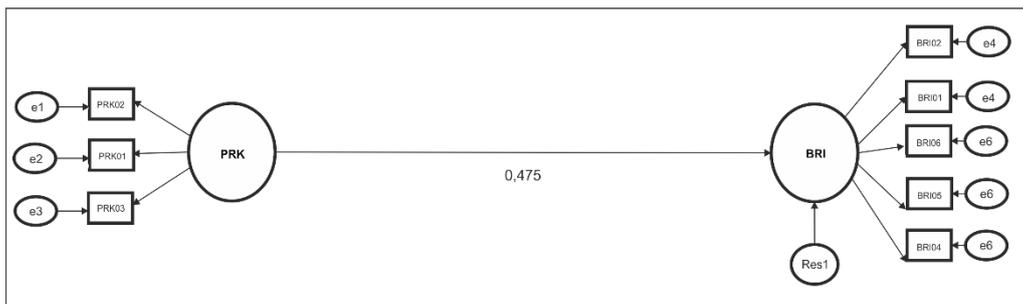
Significant correlation coefficients were discovered during the analysis, as indicated in Table 5. Three models had to be tested in order to implement this strategy. Figures 2, Figure 3, and Figure 4 present, respectively, these three models. The first model measures the direct relationship between the dependent variables and independent variables. The second model measures the connection between the mediator and independent variables. The third model measures all of the conceptual model's variables' interactions simultaneously. The following values have been found for Model 1: χ^2/DF value is 1.561. CFI and IFI are 0.997. RMSEA is 0.036. For Model 2: χ^2/DF value is 1.460. CFI and IFI are 0.995. RMSEA is 0.033. For Model 3: χ^2/DF value is 1.955. CFI is 0.988 and IFI is 0.988. RMSEA is 0.047. Each model's fit indices are considered independently. These fit indices values are beyond the thresholds (Civelek, 2018).

Figure 2. Results of SEM Analysis of Model 1



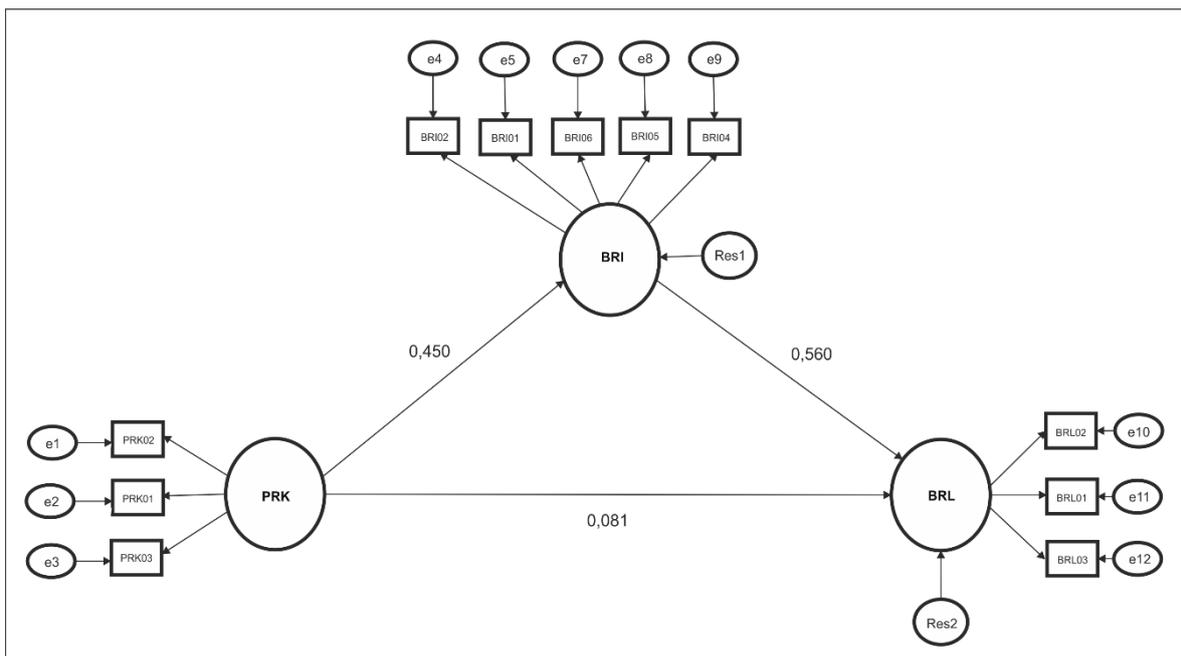
Note: $\chi^2/DF = 1.561$, CFI = 0.997, IFI = 0.997, RMSEA= 0.036

Figure 3. Results of SEM Analysis of Model 2



Note: $\chi^2/DF = 1.460$, CFI = 0.995, IFI = 0.995, RMSEA= 0.033

Figure 4. Results of SEM Analysis of Model 3



Note: $\chi^2/DF = 1.955$, CFI = 0.988, IFI = 0.988, RMSEA= 0.047

Table 6 indicates test results of three models. According to analyses results all the hypotheses are accepted. The link between PRK and BRL disappeared and turned to insignificant after BRI was included in the final model. This means that BRI plays mediator roles in the relationship between PRK and BRL.

Table 6. Test Results of the Models

Relationships	Model 1	Model 2	Model 3
PRK → BRL	0.337*		0.081
PRK → BRI		0.475*	0.450*
BRI → BRL			0.560*

Note: Path coefficients are standardized; * $p < 0.01$

5. Discussion and Conclusion

This study focuses on the impacts of product knowledge on brand image perceptions and brand loyalty behavior of consumers and the mediating role of the brand image on the effect of product knowledge on brand loyalty. The study contributes to the marketing literature by focusing on the mediating role of the product image in the relationship between the product knowledge and brand loyalty. The investigation of this unexplored area of product knowledge, brand image and brand loyalty relationship is the novelty provided by this study. Results of the analysis confirmed the positive and significant direct effect of product knowledge on brand image. When a consumer has a higher level of knowledge related to the product of a brand, this familiarity contributes positively to the image of the brand. This result was in line with the findings and conclusions of previous studies which indicate the positive effects of familiarity on the cognitive and emotional structures through knowledge formation in the memory of consumers (Kang et al., 2017; Kent & Allen, 1994; Kim et al., 2019). Another finding of this study is the significant and positive direct effect of brand image on brand loyalty. Results of the study confirmed the contribution of positive brand image perceptions on the formation of brand loyalty behavior of consumers. The findings of this study are in line with the conclusions of the existing studies in the literature (Aslam et al., 2023; Durmaz et al. 2018). The product knowledge level of consumers is also found to have a significant and positive direct effect on brand loyalty of consumers. Results confirmed that when the product knowledge level of consumers becomes higher, the brand loyalty of consumers also becomes stronger. This finding is in line with the theoretical foundations such as cost-benefit paradigm (Beach & Mitchell, 1978) and findings of the previous studies in the marketing literature (Xu et al., 2011). The final but the most important contribution of this study is the mediating effect of brand image on the effect of product knowledge on brand loyalty. When brand image is included into the model as the mediating variable, the effect of product knowledge on brand loyalty turns into an insignificant one. This is in line with the theoretical foundations since the brand image is the totality of cognitive and psychological aspects of the brand and covers product knowledge of consumers as a part of it. This parent-child relationship between two constructs caused to the shift in the significant effect of product knowledge on brand loyalty and turned into an insignificant one when other associations which make up the brand image overwrote the significant direct effect.

There are several managerial implications regarding the findings reported in the study which strongly merit to be discussed in this section. The results of the study confirm the importance of the product knowledge and brand image as the direct contributors to the brand loyalty level of consumers. Thus, brand managers, marketing managers, and customer experience managers need to focus on improving the product familiarity and brand image in the target market. In order to improve the product familiarity, more product focused marketing communication activities, product placement activities, product related social media coverage are expected to be supportive to increase the familiarity in the target segment. As the product knowledge is composed of both primary as well as secondary associations in consumer minds, marketing activities leading to the formation of primary as well as secondary associations may be utilized. In addition to the marketing communication activities such as advertising, product placement, and sampling, which mainly lead to the formation of primary associations, those marketing activities which can generate

secondary product knowledge associations, such as sponsorships, product brand cooperation with celebrity endorsers and opinion leaders, may help to the generation of secondary associations which in turn will collectively support the formation of a strong product knowledge base in consumer mind. On the other hand, a more critical point is related to the formation of strong brand image since the mediating effect of brand image on the effect of product knowledge on brand loyalty is significant and this leads us to the conclusion that the strength of the brand image is more critical than product knowledge level in determining the brand loyalty level of consumers. In order to enhance the brand image, marketing and brand managers may focus on the corporate social responsibility activities and the articulation of the social impact generated by the brand in the context of sustainability. Specifically, brands may be involved into the social causes and articulate the contributions made by the brands through the development and implementation of social marketing programs and media coverage plans. In this perspective, brand managers, marketing managers and customer experience managers need to focus on the cognitive and emotional building blocks of brand image and generate effective plans to build up or support the brand image.

This study focuses on the direct effect of product knowledge on brand image and brand loyalty, the direct effect of brand image on brand loyalty and the mediating effect of brand image on the effect of product knowledge on brand loyalty in the consumer electronics and mobile phone brands context. There are some limitations of the study which needs to be mentioned. First of all, the study was conducted in the context of mobile phone users, which can be regarded as a type of high involvement product. Product involvement level may have a differentiation effect on the mediation effect of brand image on the effect of product knowledge on brand loyalty. Moreover, the effect of product involvement, as a moderating variable, may change the direction and magnitude of inter-variable effects in the study. This leads to limitations in terms of generalizability of the results in this study across other product categories. This study may be conducted by focusing on the other retail product categories including FMCG (fast-moving consumer goods) as the low involvement product category. A second important limitation of the study is related with the cultural context. The measurement of the mediation effect of brand image on the effect of product knowledge on brand loyalty may yield different results and conclusions in different cultural contexts such as different countries. This also leads to limitations in terms of generalizability of the results in this study across different cultural contexts. The study may also be conducted in several countries at once in a cross-country comparison format to make a cross-country or cross-cultural comparison. Thus, there is a need of future research studies, which can be conducted in different contexts, in order to reach at conclusive results covering a large area of application in the marketing literature.

Declarations and Disclosures

Ethical Responsibilities of Authors: The authors of this article confirm that their work complies with the principles of research and publication ethics.

Ethical Approval: Ethical approval was obtained from Okan University Ethics Committee on 14.02.2024.

Conflicts of Interest: No potential conflict of interest was reported by the authors.

Funding: The authors received no financial support for the preparation and/or publication of this article.

Author Contributions: The authors confirm contribution to the article as follows: Conceptualization and design, Y. Rhazaoui and E. G. Sözer; data collection, Y. Rhazaoui and E. G. Sözer; analysis of data and interpretation of results, M. E. Civelek and A. V. Ertemel; writing the first draft of the manuscript, Y. Rhazaoui and E. G. Sözer; review and editing, A. V. Ertemel and M. E. Civelek. The manuscript/article was read and approved by all the authors, and all authors accepted responsibility for their article.

Plagiarism Checking: This article was screened for potential plagiarism using a plagiarism screening program.

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