

# EXAMINING THE RELATIONSHIP BETWEEN SENSORY BRANDING, BRAND AWARENESS AND PREFERENCE AFTER A BLIND TASTING TEST: AN APPLICATION ON TEA BRANDS

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## ABSTRACT

The aim of this research is to explore whether there is a relationship between sensory branding and brand awareness and blind taste. A questionnaire and an experiment were used together on 101 volunteers who were familiar with tea brands in the University of Düzce, Turkey. The questionnaire was applied to the participants to measure their sensory branding and brand awareness perceptions. In addition, for the blind taste test, the experiment was conducted. Frequency, Spearman's Rank Correlation, Cochran Q, McNemar, Mann Whitney U Test, and Logistic Regression tests were used to test the hypotheses. According to the results of the analysis, there were low and moderate relationships between sensory branding and brand awareness in tea brands. In addition, according to the results of the Cochran Q and McNemar tests, there was a difference between the tea brands based on the participants' blind taste test responses. Moreover, it was determined that the sensory brand perception of the participants did not differ according to the blind taste test results. Similarly, the findings of the blind taste test revealed that the participants' brand awareness perceptions did not differ. Furthermore, according to the logistic regression analysis findings, sensory branding and brand awareness did not have any effect on the blind taste test. According to the findings of this research, even though the product contents were same, brand studies created awareness in the consumer.

## KEY WORDS

sensory branding, brand awareness, blind tasting test, branded taste, tea brands

## CLASSIFICATION

JEL: C93, M31

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## INTRODUCTION

In today's competitive environment, the contents, prices and features of the products are very similar to each other. This leads to impersonal brand experiences [1]. However, with the communication studies, the products are shown to the consumer as if they are different [2]. In today's world of communication, humans are almost bombarded with messages. Today, when a consumer reaches the age of 65, he or she has spent 6 years of his life watching advertisements for eight hours a day, seven days a week [3]. It has even been claimed that children can have beliefs about brands until the age of two, and can distinguish the names, logos, and emblems of brands between the ages of two and six [4]. Consumers can receive messages every day, every hour, and every minute as a result of globalization and the internet's entry into our life. In order to gain competitive advantage in the globalizing world and not to lose the existing market, businesses need to take place in the virtual world [5]. Businesses are boosting the strategies they apply for the senses of color, shape, sound, taste, smell, and touch in order to influence consumers. It has become important to stay in the mind in this chaos. In other words, those who can direct the perception of the consumer can be successful. As Aristotle said, "perception is reality".

The mainstay of the sensory branding approach, which became widespread especially in the 2000s, was the possibility of settling in the memory through the senses and the senses causing various emotions [6]. Sensory branding can be defined as marketing that engages consumers' senses and influences their perceptions, judgments, and behaviors [7]. Many products are tested by smell, hearing, touch, sight, and taste. As a consequence of these trials, the quality of the products is evaluated and a link to previous experiences is established [3]. More than one sense organ is used to test some products. Especially in the food industry, there are studies that will activate other senses along with taste. Both corporations and academia are involved in these investigations. Starbucks, for example, was able to achieve success by combining visual, aural, and tactile senses with its atmosphere, along with taste [8]. When compared to other industries, the food industry has the advantage of utilizing the sense of taste. This intuition may be lacking in other industries.

Special structures called "Taste Buds" in the tongue enable us to taste. It takes about 0,2-0,5 seconds to feel the taste of something on the tongue [9]. The sense of taste varies according to culture, lifestyle, and habits [10]. The social culture to which people belong has a strong influence on individual taste preferences [1]. Mexicans, for example, prefer spicy foods, while Indians prefer spicy foods more. Sweet foods are more popular in Turkey and the Middle East. Alcohol consumption is a socially acceptable practice among Croats [11]. Drinking tea is also a socially accepted behavior in Turkey. In fact, tea originating from the Far East is preferred without sugar, while in Turkey, tea can be preferred with sugar. McDonalds and Burger King can build menus that reflect the tastes of different countries. In this context, it can be said that the positive or negative evaluation of tastes by consumers occurs as a result of socially learned behaviors, not genetic inheritance [12].

Tea, the world's most consumed beverage after water [13, 14], was investigated in this study. Tea has a 5 000-year history, and it is produced in over 45 nations throughout the world [15]. According to the world tea report, Turkey ranks first in annual tea consumption per capita with 3,5 kg. Middle Eastern countries have very high rates of black tea use. In this regard, it is critical to investigate the sensory feelings that tea creates on people.

The main purpose of this study is to explore the relationship between sensory branding, brand awareness and blind taste testing. For this purpose, an application was carried out on tea brands. Despite the fact that the number of studies on sensory branding is growing day by day, they are not yet sufficient [16]. Since studies in this field are few, this study is important in terms of

contributing to the literature. Furthermore, this research is useful in understanding the value of sensory brand in developing tea company brand strategies and conducting communication studies in this area.

## **SENSORY BRANDING**

The use of the five senses by a brand to develop brand identity and position the brand on an individual level is known as sensory branding [1]. Sensory branding is to leave a permanent mark on the consumer with the works that appeal to the five senses (taste, sound, sight, hearing, touch). Human senses are used to distinguish one brand from another [17]. Communication researchers attempt to develop a link between these senses and the product. With sensory branding studies, it is tried to create a perception in the subconscious of consumers [16]. Consumers get more personal, emotional, and cultural experiences with sensory branding [1].

Sight is still one of the most remarkable senses among the five senses [3]. The sense of sight is especially crucial today when comparing products with similar content and qualities. Perception with the sense of sight takes 45 milliseconds [18]. On the other hand, smell is known to be the slowest sense of human beings [19]. Smell is 10 times slower than sight. But once the smell is noticed, it becomes permanent. The smell is still remembered after all these years [20]. The experience of flavor by humans is known as the sense of taste. Each taste bud on the tongue can distinguish between 50 and 100 different flavors. There are four tastes that humans distinguish: sweet, sour, bitter, and salty. Recently, another flavor called umami has been discovered [21]. It is the flavor that appears when the Glutamate component in meals is heated.

All tastes are associated with other senses such as sight, hearing, smell, and touch [22]. Some senses are thought to be more effective when used jointly. The sense of taste is the one that interacts with the sense of sight the most [1]. However, it will be most effective to address the consumer by using all the senses together. It does not make any sense when we think of an auditory horror movie without a visual and a visual horror movie without an auditory [3]. Likewise, the senses of sight and taste can be more effective together.

Companies appeal to the five senses to generate powerful memories in the minds of consumers in order to establish a strong relationship between consumers and brands [22]. This is possible with sensory branding. Coca Cola, Starbucks, McDonald's, Nutella, and Nescafe are the leading brands that make sensory branding. When the studies conducted with these brands are examined, it has been seen that sensory branding has an effect on brand loyalty [23]. In this case, it can be said that companies that make sensory branding can create brand awareness. In other words, the more attention is paid to sensory branding, the greater the brand awareness is [22].

Kellogg's, which has been researching the relationship between crispness and taste for years, signed a contract with a Danish laboratory and patented a special crackling sound. In the result of his research, he discovered that the cracking sound is related with freshness. This shows that there is a sense of freshness in the crunch-taste interaction [3].

## **BRAND AWARENESS**

Brand awareness can be defined as anything from a vague recognition of the brand to the assumption that the product is the only one of its kind [24]. There are two sub-variables of brand awareness. These are recognition and recall [25]. Brand recall can be expressed as the consumer's ability to use past information when a clue about the brand or something reminiscent of that brand is encountered [26]. For example, in the Middle Eastern countries, especially in Turkey, there is a culture of offering tea when people come together. Tea is commonly consumed with breakfast and immediately after meals in Turkey. It is part of both

physiological and social demands in this scenario. A well-brewed and good-tasting tea can be associated with a tea brand by combining past experiences. In another example, Coca Cola is an example to remember when a consumer is thirsty or needs a drink alongside a meal. When consumers perceive a good or service with their five senses, the trust in that product also increases [27].

It is essential to focus on the internal process in consumer purchasing behavior in order to establish a strong brand. Many of the internal processes are linked to different senses of the body [22]. These senses are sight, smell, touch, sound, and taste [22]. Each tea brand produced in Turkey has its own brand image, personality, and different perceptions due to these characteristics [28]. In fact, tea produced in Turkey is mostly produced in the same region. However, it can be perceived differently with the packaging and communication studies carried out by the private sector. In this case, tea brands with similar content, properties and taste can be perceived differently. This situation is similar to gas stations. In fact, the fuel coming out of the same refinery can be perceived differently by different stations. Tea brands were evaluated in terms of quality and fulfilling the expectations in a study on tea brands in Turkey [28], Ofçay came first, followed by Lipton and Doguş tea. In terms of diversity and suitability for health, the ranking has changed as Lipton/Doguş tea and Ofçay.

Brand awareness and packaging studies are as important as sensory branding [29]. According to a study, product packaging has an impact on taste perception. The consumer can look at the packaging and generalize the taste of the product [30]. In a study conducted on children to measure the effect of packaging on their sense of taste, when asked which of the two products they would prefer, 51,2 % of the participants stated that they would prefer the animated beverage, while 48,7 % stated that they would prefer the non-animated product. Animation designed products have become the reason for preference at the point of purchase by establishing an emotional connection due to the cartoon characters. Non-animated designed products, on the other hand, provided a sense of trust due to their transparency and became a naturally defined taste [31].

In a study on McDonald's foods ( $n = 63$ ), no significant difference emerged between the predictions about which foods belong to the brand. However, it turned out that children exposed to McDonald's advertisements were more likely to predict the taste of food [4]. According to the results of another study conducted on students ( $n = 317$ ) about the Burger King brand, it was concluded that there is a positive and significant relationship between sensory branding and brand awareness [24].

It is thought that sensory branding is related to brand awareness, based on research findings in the literature. Based on the findings of this study, the following hypothesis was developed.

**H<sub>1</sub>:** *There is a relationship between sensory branding and brand awareness.*

## **BLIND TASTE TEST AND RELATED LITERATURE**

The blind taste test is an experiment that gives information about the sensory (sight, hearing, taste, smell, and touch) quality of the product [29]. This test can also be investigated with the concept of pleasantness in the literature [32, 33].

In a study on university students ( $n = 30$ ), coffee taste was tested. The participants were asked to drink any coffee they liked, identify the brand of coffee they were drinking, and describe their feelings in the first ten seconds. In addition, the participants said that they would prefer the leading coffee brand Nescafe before doing the coffee taste test. As a result of the blind taste test, the predictions were not correct when asked which brand of coffee they drank [10].

In another study, students ( $n = 57$ ) were exposed to a blind taste test relating to cold tea [12]. The hypothesis that the individuals should be able to recognize and choose the brand they previously preferred in taste tests was evaluated in the study. As a result of the pre-test and post-test, they were expected to find the brand they preferred. The subjects participating in the study could not distinguish the cold tea that they said they liked in the taste test. In this case, it can be said that other senses other than taste are effective.

Moreover, the association between blind taste testing and branded taste with purchase intent was investigated ( $n = 107$ ) in a study. According to the findings, people who are familiar with the product have more purchase intentions than those who are unfamiliar with the product. There were no differences between blind tasting and branded tasting tests for people who were unfamiliar with the product [29].

In another study, a blind taste test was used to examine whether there was a difference between tap water and bottled water. According to the blind taste test results ( $n = 578$ ), while there is a significant difference in brand awareness (quality, trust, health, risk, etc.); participants could not discriminate in the blind taste test [34].

Furthermore, in a study on packaged dairy products ( $n = 138$ ), different results emerged in the branded tasting and blind tasting test. In the branded blind tasting test, the participants stated that there were significant differences between brands. Although it was stated that organic milk consumption was higher (61,7 %), organic milk received the lowest score in the blind taste test [35].

The tastes of national and retail brands were compared in a study ( $n = 119$ ), and it was discovered that the taste of national brands was preferred more [36]. In a study on Pepsi and Coca Cola, it was found that participants ( $n = 67$ ) in blind taste tests stated that Pepsi tasted better, but in the branded taste test, they said that Coca Cola tasted better [37].

The main hypotheses and sub-hypotheses formed from the purpose and problem of the research are as follows.

**H<sub>2</sub>:** *There is a difference between tea brands according to the blind taste test result.*

**H<sub>3</sub>:** *Sensory branding perception differs according to blind taste test results.*

**H<sub>4</sub>:** *Brand awareness perception differs according to the blind taste test results.*

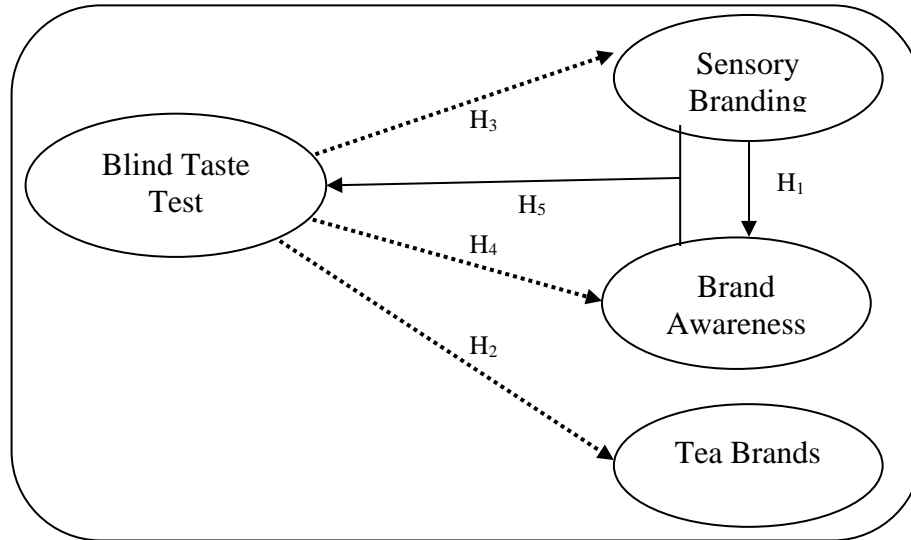
**H<sub>5</sub>:** *Sensory branding perception and brand awareness perception have no effect on the blind taste test.*

## **RESEARCH METHOD**

This research proposes a model to explore the relationship between sensory branding, brand awareness and blind taste testing. The hypotheses proposed to be tested are shown in Figure 1. The model hypothesizes a relationship between sensory branding and brand awareness. It also suggests that there is a difference between brands of tea based on the blind taste test. Moreover, it offers that sensory branding perception and brand awareness perception differ according to the blind taste test. Last but not least, it offers that perception of sensory branding and perception of brand awareness have an impact on the blind taste test.

## **POPULATION AND SAMPLING**

The population of the research consists of people over the age of 18 who were generally familiar with and consume the tea brands that are the subject of the research. Private sector



**Figure 1.** Research model.

tea brands, which are the most preferred producers in Turkey, have been taken into account. These private brands are Lipton, Doğuş and Ofçay [28]. In the related study, these brands were coded as T1, T2 and T3 brands to ensure confidentiality. Quota sampling method, which is one of the non-random sampling methods, was used in order to choose the participants. In this context, it is important that the distribution of participants is close to each other in terms of comparison, as tea brands representing different sensory branding and brand awareness components. For this reason, the participants were included in the research by classifying them according to their tea brand preference and determining the quota. Thus, in the study, a quota was designed to ensure that at least 20 persons from each of the relevant tea brands were targeted. Both a questionnaire and an experiment were conducted with 101 participants on a voluntary basis. Due to the nature of the research, it was not possible to collect a large number of data, since measurements were made not only with the survey method, but also with the experimental method. In terms of the reliability of the research, it is stated that data should be collected at least 5 times the number of items used [38, 39]. There are 16 items in total belonging to the two main variables of the study. Since data were collected approximately seven times the total number of items in this study, it is thought that the amount of data is sufficient for the reliability of the research results.

## ETHICAL STATEMENT

The authors of the study declare that they continue to work in accordance with scientific study ethics and the Helsinki declaration in the study. Accordingly, the research was reviewed by the Scientific Research and Publication Ethics Committee of Duzce University and was given permission (Date: 27/12/2019, Number: 2019/118). In addition, the participants of this study participated in the research on a voluntary basis. Moreover, in this study, the most preferred private sector tea brands Lipton, Doğuş and Ofçay in Turkey were chosen as sample products. In the related study, these brands were coded as T1, T2 and T3 brands in order to keep the names of the relevant brands confidential. The purpose for keeping these brand names confidential is to prevent the research's findings from having a favorable or negative impact on these tea brands.

## MEASUREMENT AND DATA COLLECTION PROCESS

The research consists of two measurements. In the first measurement, a questionnaire was applied to the participants. In the measurement of sensory branding perception, the study of

Uddin [22] was used. In this scale, there are 5 items created to measure sensory branding perception by considering all five senses. The scale related to brand awareness was created by adapting the study of Yoo, Donthu and Lee [40] study and the expressions in Aaker's definition [25]. In this scale, there are 11 items. A five-point Likert scale was used to determine the characteristics related to sensory branding and brand awareness variables (1 – strongly disagree, 2 – disagree, 3 – neither agree nor disagree, 4 – agree, and 5 – strongly agree).

In the second part, a blind taste test was conducted. It is stated that the senses act together and have an effect onto the consumer [3]. In this direction, taste and image together create a different effect on the mind of the consumer. In this study, the difference between taste and appearance is examined by using a blind taste test. In the Blind Tasting test, the participants were asked to taste the teas without using any brand symbols (hiding them).

After this experiment, a number of questions were asked in terms of the taste of the teas. These questions are in the form of which tea belongs to which brand, which taste is the best, and the classification of teas with similar tastes and undesirable tastes. The blind taste test was conducted using 4 oz paper cups and 2/3 of the cups filled. Tea brands are written invisible on the bottom of the glasses. After the participant's blind taste test, the answer given to the question of which brand the tea he drank was written on the side of the glass. Glasses in which the participant's name was written were kept until the end of the research. Participants with flu and colds were not included in the experiment.

## **STATISTICAL ANALYSIS**

Data were analyzed through IBM SPSS Statistics 26 program. In the data analysis process, firstly, preliminary analyzes were made by frequency analysis to determine the demographic characteristics of the sample and normality test to examine the normality assumption of the data. The normality of the data was examined using the kurtosis and skewness scores and their cutoff values [41, 42]. After it was determined that the data were not normally distributed as a result of the skewness and kurtosis values examined, it was decided to use non-parametric methods to test the research hypotheses. Accordingly, Spearman's Rank Correlation, Mann Whitney U Test, Cochran Q Test, McNemar test and Logistic Regression were used to test the hypotheses.

## **FINDINGS**

### **DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS**

When the participants included in the study were examined in terms of gender, it was seen that the male and female ratios were close to each other as given in Table 1 (56 % to 44 %, respectively). When evaluated in terms of income, around a quarter of the participants fell into the lowest income group, while about half of them were at the highest of the income group. Various demographic data of the participants about tea and tea brands were reported before evaluating the research hypotheses about tea brands. Thus, it was aimed to estimate the inclusiveness of the research. In this frame, when the answers given by the participants to the question of how often they drink tea, as given in Table 1, were examined, it was discovered that the majority of the participants consume at least 3-4 cups of tea per day. The participants who drink tea were more or less similar, according to the tea drinking frequency categories defined, and the rate of those who consume 9 cups or more of tea was slightly lower than the other groups (15 %). When the tea brands examined in the study were evaluated according to most preferred ones, it was observed that 24 % prefer T1, 34 % favor T2, and 43 % choose T3.

**Table 1.** Demographic Characteristics of Participants.

		<i>n</i>	%
<b>Gender</b>	Male	57	56,4
	Female	44	43,6
<b>Income</b>	3501-5000 (₺) (low)	24	23,8
	5001-6500 (₺) (moderate)	29	28,7
	6501 (₺) and over (high)	48	47,5
<b>Tea drinking frequency</b>	3-4 cups	23	22,8
	5-6 cups	31	30,7
	7-8 cups	32	31,7
	9 cups and over	15	14,9
<b>Most preferred tea</b>	T1	24	23,8
	T2	34	33,7
	T3	43	42,6
<b>Preferred type of tea</b>	teabag	21	20,8
	bulk tea	80	79,2

Participants should be familiar with tea brands in general to ensure the research’s reliability and validity. Table 2 shows the participants’ level of familiarity with various tea brands for this purpose. Table 2 shows that, while only 2% of people are unfamiliar with tea brands, the majority are more familiar than the average.

**Table 2.** Familiarity of Participants to Tea Brands.

	Extremely Unfamiliar	Very Much Unfamiliar	Moderately Unfamiliar	Slightly Unfamiliar	Neither Familiar nor Unfamiliar	Slightly Familiar	Moderately Familiar	Very Much Familiar	Extremely Familiar	Total
<i>n</i>	2	5	7	12	15	12	16	11	21	101
%	2	5	6,9	11,9	14,9	11,9	15,8	10,9	20,8	100,0

In the research, it was also asked whether the tea brands made sensory branding. The concept of sensory branding was explained at the beginning of the question before this question was asked, considering that there may be some among the participants who do not know what sensory branding is. Table 3 summarizes the results. When asked about sensory branding, more than half of the participants stated that all tea brands do sensory branding.

Table 3 also includes the findings of the participants’ blind tasting tests. Accordingly, the rate of correctly knowing the brand of the tea they drink was moderate (57 %, 51 % and 68 % for

**Table 3.** Sensory Branding Perception of Tea Brands and Blind Taste Test Findings.

<b>Status of Making Sensory Branding</b>				<b>Blind Taste Test</b>			
		<i>n</i>	%			<i>n</i>	%
<b>T1</b>	Yes	56	55,4	<b>T1</b>	True	58	57,4
	No	45	44,6		False	43	42,6
<b>T2</b>	Yes	52	51,5	<b>T2</b>	True	51	50,5
	No	49	48,5		False	50	49,5
<b>T3</b>	Yes	52	51,5	<b>T3</b>	True	69	68,3
	No	49	48,5		False	32	31,7



T1, T2 and T3, respectively). This shows that the rate of those who misunderstand is too high to be ignored in all three types of tea brands.

The answers given by the participants to the best and worst tea tastes after the blind taste test were presented in Table 4. As can be seen in Table 4, It was discovered that the participant chose all tea brands in a ratio that was close to each other in terms of the best taste. In the same table, there were answers given by the participants about which tea taste was the worst. Accordingly, the ranking of the tea brands in terms of worst taste was stated as T1, T2 and T3.

**Table 4.** Best Taste and Worst Taste (After Blind Taste Test).

Tea Brands	Best Taste		Worst Taste	
	<i>n</i>	%	<i>n</i>	%
<b>T1</b>	30	29,7	51	50,5
<b>T2</b>	38	37,6	32	31,7
<b>T3</b>	33	32,7	18	17,8

Normality tests were employed to assess whether the data had a normal distribution before starting with the analyses that would be used to evaluate the hypotheses. As a result, it was decided whether parametric or non-parametric testing would be utilized. In this way, skewness and kurtosis values of data were assessed as +2 and -2 in study to determine data normality [41]. Thus, it was determined that the skewness and kurtosis values of all items did not change between -2 and +2. As a result, non-parametric tests were used.

### **SPEARMAN'S RANK CORRELATION ANALYSIS**

In order to assess the H<sub>1</sub> hypothesis of the research, Spearman's Rank Correlation analysis was utilized to test if there is a link between sensory branding and brand awareness perception. Table 5 displays the results observed.

**Table 5.** Spearman's Rho Correlation Test.

	T1 Sensory B.	T1 Brand Aw.	T2 Sensory B.	T2 Brand Aw.	T3 Sensory B.	T3 Brand Aw.
T1 Sensory B.	1,00					
T1 Brand Aw.	0,318**	1,00				
T2 Sensory B.	0,440**	-0,085	1,00			
T2 Brand Aw.	-0,057	0,210*	0,339**	1,00		
T3 Sensory B.	0,232*	-0,147	0,455**	-0,018	1,00	
T3 Brand Aw.	0,070	0,185	0,063	0,326**	0,234*	1,00

\*correlation is significant at the 0,01 level

\*\*correlation is significant at the 0,05 level

When Table 5 was examined, according to the Spearman's Rho Correlation test result, it was seen that there was a moderate positive relationship between sensory branding and brand awareness for T1 ( $r = 0,318, p < 0,01$ ). It was seen that there was a moderate positive relationship between sensory branding and brand awareness for T2 ( $r = 0,339, p < 0,01$ ). For T3, on the other hand, it was presented that there was a weak positive relationship between sensory branding and brand awareness ( $r = 0,234, p < 0,05$ ). Thus, the H<sub>1</sub> hypothesis of the research, "there is a relationship between sensory branding perception and brand awareness perception", was accepted as a result of the Spearman Correlation Tests.

### **COCHRAN Q TEST**

The Cochran Q test was used to test the study's H<sub>2</sub> hypothesis that there is a difference between tea brands based on the blind tasting responses of the participants. Thus, the compatibility of

the decisions made by the participants for each tea item was examined with this test. In other words, with this test, it was determined to what extent the observation values of one participant were similar to the observation values of other participants. Table 6 displays the results of Cochran Q test.

**Table 6.** Cochran Q Test.

Tea Brands	n	Blind Test Results		df	Cohran's Q	Sig.
		True	False			
T1	101	58	43	2	6,861	0,032
T2	101	51	50			
T3	101	69	32			

According to the results of the Cochran Q test given in Table 6, the hypothesis that there was no difference in the perceptions of the participants about the brand of tea they drank as a result of the blind taste test was rejected ( $Q = 6,861; p = 0,032 < 0,05$ ). As a result, there was a difference between the the participants about blind taste test. The result of the McNemar test performed to find the source of the difference was given in Table 7 (McNemar's test was used to compare pairs of the groups with defects and the results were presented in Table 7).

**Table 7.** Pairwise comparison of the groups using McNemar's test ( $n = 101$ ).

Test	T1-T2	T1-T3	T2-T3
Chi-square	0,706	2,326	5,780
Asymptotic significant	0,401	0,127	0,016

As can be seen in Table 7, the source of the difference in the blind taste test results was the perceptions of the participants about T2 and T3 teas. (Only T2-T3 pairwise comparisons were statistically significant ( $p < 0,05$ )). In other words, the blind taste test results differ only in terms of T2 and T3 teas. As a result of the findings, the  $H_2$  hypothesis of the research, "there is a difference between tea brands based on the blind tasting responses of the participants", was accepted.

### MANN WHITNEY U TEST

Mann Whitney U Test was used to test the third hypothesis of the study, "sensory branding perception differs according to the blind taste test" and the  $H_4$ , "brand awareness perception differs according to the blind taste test". Table 8 displays the results. As can be seen in Table 8, the sensory branding perception of the participants does not differ according to the results

**Table 8.** Mann Whitney U Test for Sensory Branding Perception Considering Blind Taste Test.

Variables	Blind Test Results	n	Mean Rank	Sum of Ranks	U	p
T1 Sensory Branding	True	58	55,74	3233	972	0,058
	False	43	44,60	191		
T2 Sensory Branding	True	51	54,35	2772	1104	0,244
	False	50	47,58	2379		
T3 Sensory Branding	True	69	50,75	3502	1087	0,901
	False	32	51,53	1649		
T1 Brand Awareness	True	58	54,43	3157	1048	0,171
	False	43	46,37	1994		
T2 Brand Awareness	True	51	51,41	2622	1254	0,886
	False	50	50,58	2529		
T3 Brand Awareness	True	69	53,84	3715	908	.152
	False	32	44,88	1436,		

of the blind taste test for T1 ( $U = 972, p > 0,058$ ). In other words, the difference between the participants' sensory branding averages and whether the tea brand is accurately recognized or not is not significant. Accordingly, the sensory branding scores of the participants did not depend on whether it was correctly known that the tea they drink was T1 brand. This finding was supported by the fact that the sensory branding mean rank of those who correctly knew that the tea they drink was T1 brand and those who misunderstood was close to each other.

In addition, the sensory branding perception of the participants did not differ according to the blind taste test results for T2 and T3 brands in Table 8 (respectively,  $U = 1104, p > 0,244$ ;  $U = 1087, p > 0,901$ ). In other words, the difference between the sensory branding scores of the participants and whether the tea brand was known correctly was not significant in terms of T2 and T3 tea. Accordingly, the sensory branding scores of the participants did not depend on whether it was correctly known that the tea they drink were T2 and T3 tea brand. This finding was supported by the fact that the sensory branding mean rank of those who correctly knew that the tea they drink was T2 and T3 brand, and those who misinterpreted, were near to each other. In this context, the difference between the sensory branding scores of T2 and T3 tea brands and whether the tea brand was known correctly or not was similar to the T1 tea findings. In the light of all these findings, the  $H_3$  hypothesis of the research, "The sensory branding perception of the participants differs according to the results of the blind taste test", was rejected.

Furthermore, as shown in Table 8 for the fourth hypothesis findings, the participants' brand awareness perceptions do not alter based on the outcomes of the blind taste test for T1 tea ( $U = 1048, p > 0,171$ ). In other words, there was no significant difference between the participants' brand awareness averages and whether the tea they consume was known as T1. Accordingly, the brand awareness scores of the participants did not depend on whether it was correctly known that the tea they drink was the T1 brand. This finding was also supported by the close mean rank of brand awareness of those who knew the right thing and those who knew wrong about the tea they drink. Similarly, the brand awareness perception of the participants did not differ according to the blind taste test results for T2 and T3 tea brands (respectively;  $U = 1254, p > 0,886$ ;  $U = 908, p > 0,152$ ). In other words, the difference between the brand awareness averages of the participants and whether the brand of tea they drink was T2 and T3 tea was not significant. Accordingly, the brand awareness averages of the participants did not depend on whether it was correctly known that the tea they drink was T2 and T3 brand.

This finding was also supported by the fact that the brand awareness rank averages of those who correctly knew that the tea they drink were T2 and T3 brands, and those who misunderstood, were close to each other. In the light of all these findings, the  $H_4$  hypothesis of the research, "The brand awareness perception of the participants differs according to the results of the blind taste test", was rejected.

## **LOGISTIC REGRESSION**

Logistic Regression analysis was used to test the  $H_5$  hypothesis of the research, "sensory branding perception and brand awareness perception have no effect on blind taste testing". First, the results of the Logistic Regression Analysis for T1 were given in Table 9. Hosmer and Lemeshow tests were used to test the fit of the created Logistic Regression Model to the data. If the significance level of this test is greater than 0,05, it indicates that the model is suitable for the data. In the study, this statistic was found as  $p = 0,574$  ( $\chi^2 = 6,65, df=8$ ). Therefore, it can be said that the model created is suitable for the data. The coefficients of the two independent variables were determined as  $\beta_1 = -0,446$ ,  $\beta_2 = -0,366$ , but both independent variables were insignificant ( $p > 0,05$ ).

**Table 9.** Coefficient of LR of Model for Brand T1.

	B	S.E.	Wald	df	Sig.	Exp(B)	95 % C.I.for Exp(B)	
							Lower	Upper
T1 Sensory B.	-0,446	0,248	3,234	1	0,072	0,640	0,394	1,041
T1 Brand Aw.	-0,366	0,371	0,975	1	0,323	0,693	0,335	1,434
Constant	2,189	1,210	3,271	1	0,071	8,922		

In this case, the Logistic Regression Model can be expressed as follows:

$$\text{Ln}Y = 2,189 - 0,446 \cdot X_1 - 0,366 \cdot X_2.$$

The coefficients were not interpreted since the derived model's results were meaningless. The proper classification rate of the data from which the model was derived, on the other hand, is shown in Table 10.

**Table 10.** Correct Classification Ratio of the Model for Brand T1.

Observed		Predicted		
		Blind Test Results		Correct Percentage
		True	False	
Blind Test Results	True	50	8	86,2
	False	27	16	37,2
Overall Percentage				65,3

The correct classification ratio of the models was created by taking the cut-off value of 0,5 and was shown in Table 4. The correct classification rate of the model was determined as 65,3 %. Therefore, as a result, using the independent variables that explain the model, it could be predicted with 65,3 % accuracy whether the participants would be assigned to the correct or incorrect groups based on the type of tea they consume. This value was greater than 51,1 %  $((58/101)^2 + (43/101)^2 = 0,511)$ , indicating that the success was attributed to coincidence. Therefore, it could be considered that the model performs a successful classification.

The results of the LR analysis for T2, another tea brand, were given in Table 11. The fit of the constructed Logistic Regression Model to the data was tested using the Hosmer and Lemeshow tests. This statistic was determined as  $p = 0,369$  ( $\chi^2 = 8,79$ ,  $df=8$ ) in the research, indicating that the model generated was appropriate for the data. The coefficients of the two independent variables were determined as -0,330 and 0,008, respectively. However, neither independent variable was significant ( $p > 0,05$ ).

**Table 11.** Coefficient of LR of Model for Brand T2

	B	Lower	Lower	df	Sig.	Exp(B)	95 % C.I.for Exp(B)	
							Lower	Upper
T2 Sensory B.	-0,330	0,237	1,936	1	0,164	0,719	0,452	1,144
T2 Brand Aw.	0,008	0,338	0,001	1	0,982	1,008	0,519	1,955
Constant	0,973	1,036	0,883	1	0,347	2,647		

In this situation, the LR model can be represented as follows:

$$\text{Ln}Y = 0,973 - 0,330 \cdot X_1 + 0,008 \cdot X_2.$$

The coefficients were not interpreted since the derived model's results were meaningless. The correct classification rate of the data from which the model was created, can be seen in Table 12.

**Table 12.** Correct Classification Ratio of the Model for Brand T2.

Observed		Predicted			
		Blind Test Results		Correct Percentage	
		True	False		
Blind Test Results	True	22	29	43,1	
	False	25	25	50,0	
Overall Percentage				46,5	

The correct classification ratio of the models was created by taking the cut-off value of 0,5 and was given in Table 12. As can be seen, the correct classification rate of the model was obtained as 46,5. As a result, using the independent variables that explain the model, it was possible to estimate with 46,5 % whether the participants would be assigned to the correct or incorrect groups based on the type of tea they consume. This value was less than 50,0 %  $(51/101)^2 + (50/101)^2 = 0,50$  indicating luck-based success. Therefore, it could not be said that the model made a very successful classification.

On the other hand, the results of the LR created for T3 brand were shown in Table 13. The fit of the constructed Logistic Regression Model to the data was tested using the Hosmer and Lemeshow tests. In the study, this statistic was obtained as  $p = 0,984$  ( $\chi^2 = 1,882$ ,  $df = 8$ ), so it could be said that the model created was suitable for the data. The coefficients of the two independent variables were determined as  $\beta_1 = -0,085$ ,  $\beta_2 = -0,522$ , but both independent variables were insignificant ( $p > 0,05$ ).

**Table 13.** Coefficient of LR of Model for Brand T3.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for Exp (B)	
							Lower	Upper
T3 Sensory B.	0,085	0,229	0,138	1	0,710	1,089	0,695	1,706
T3 Brand Aw.	-0,522	0,361	2,096	1	0,148	0,593	0,293	1,203
Constant	0,634	1,200	0,279	1	0,597	1,885		

Then, the LR Model can be expressed as follows:

$$\ln Y = 0,634 + 0,085 \cdot X_1 - 0,522 \cdot X_2.$$

Since the results of the model were meaningless, the coefficients were not interpreted. On the other hand, the correct classification rate of the data from which the model was obtained is given in Table 14.

**Table 14.** Correct Classification Ratio of the Model for Brand T3.

Observed		Predicted		
		Blind Test Results		Correct Percentage
		True	True	
Blind Test Results	True	68	1	98,6
	False	31	1	3,1
Overall Percentage				68,3

The correct classification ratio of the models was created by taking the cut-off value of 0,5 and was represented in Table 14. The model's correct classification value was observed as 68,3 %. Therefore, using the independent variables that explain the model, it was possible to predict with 68.3 percent accuracy whether the participants would be assigned to the correct or incorrect groups based on the type of tea they consume. This value is greater than 56,7 %  $(69/101)^2 + (32/101)^2 = 0,567$ , indicating that the success was attributed to chance. Therefore, it could be said that the model performs a successful classification.

In this direction, when the LR findings were evaluated as a whole, it was revealed that sensory branding perception and brand awareness perception of tea brand did not affect the blind taste test. Therefore, H<sub>5</sub> hypothesis of the study, “sensory branding perception and brand awareness perception have an effect on blind taste testing”, was accepted.

## CONCLUSION

When the findings of this study are evaluated, it becomes clear that the participants’ views on tea brands differ in terms of sensory branding, brand awareness, and blind taste testing. According to the study’s findings, the participants were quite familiar with the drinking of tea and mostly used bulk tea. This conclusion is consistent with data from Turkish tea statistics.

In the blind tasting test, participants were asked to choose the best and worst tea. T2, T3 and T1 were selected respectively in the best taste selection, while T1, T2 and T3 were selected in the worst taste selection. This result was different from the results of Deveci et al. [28]. It seems that in the blind tasting test, no difference is detected in the ranking of the best and worst tea.

The correlation test indicated that there is a positive relationship between sensory branding and brand awareness. As a result, sensory branding is critical in today’s competitive environment for positioning in the minds of consumers. These findings are similar to those of Kytö [29], Yilmaz et al. [31], Robinson et al. [4], Erenkol [24], Tosun and Elmasolu [23]. Sensory branding, rather than standard branding, can be used to raise awareness for tea firms in this direction. More effective results can be obtained with the five senses. It has been understood that the brands studied have recently had very little work on sensory branding. The participants were undecided about whether the tea brands used sensory branding.

After the blind taste test, there was no difference between T1 tea and other teas, but a significant difference emerged between T2 tea and T3 tea. While no significant difference was found after the blind taste test in the literature [10, 12, 34, 36, 37], there was a partial difference in this study. This result was reported by Kytö [29] and Robinson et al. [4] which shows similar results with this study.

The Mann Whitney-U test was used to determine the difference between sensory branding, brand awareness, and drinking tea after the blind taste test. There was no difference according to the results. In other words, although the participants were aware of the tea brands, they could not find out which brand the tea was drunk after the blind taste test. This result is generally accepted in the literature.

The effects of sensory branding and brand awareness on the blind taste test were tested with logistic regression. After analyzing the data, it was discovered that sensory branding and brand awareness had no effect on the blind taste test. As a result, it is possible to conclude that completing brand work is critical for distinguishing similar or identical products.

Given the fierce rivalry in the tea sector, conducting brand research is essential. In this direction, it is recommended that tea companies place a greater emphasis on brand communication studies.

## LIMITATIONS

This study has limitations in terms of time, place and product. First of all, this study is a cross-sectional study limited to 2021. During this period, tea brands may not have done enough communication work. In this direction, the periods when tea brands have and have not done communication work can be examined separately. The second limitation is that it was limited to Düzce province. Consumers with tea drinking culture in various regions of Turkey or other countries might be researched comparatively. The relationship between sensory branding,

awareness of difference and blind taste test of international-national brands can be examined. It is possible to investigate the relationship between sensory branding, brand awareness, and blind taste testing of manufacturer and retailer brands. The third limitation is the brewing method that is used in the test, and the type of tea considering only black tea was used. Future studies can also be carried out using different types of tea and different brewing methods.

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