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EXAMINING CHANGES IN THE RESTAURANT MENU AND ITS IMPACT ON CONSUMER CHOICE BEHAVIOR

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ABSTRACT

The present review investigates changes in the restaurant menu and its impact on consumer choice behavior. This study is an experimental and has been conducted in Iran. In this research, one restaurant was chosen and by making four targeted changes in price, layout, images and inserting calories in restaurant menus, the behaviors of 1000 customers in 5 non-consecutive weeks, were examined. The results showed that changes in the restaurant menu under the study had a significant influence on consumer's behavior. The findings also proved that insert the image on the menu, had a direct relationship with consumer's choice of the same type of food. This variable has caused the greatest amount of sales.

Keywords: restaurant menu, choice the behavior of customers, price, layouts, backgrounds, amount of calories

INTRODUCTION

The act of giving menu to restaurant costumers described as, "The ability to place an advertisement in every customers hand before they part with their money" (Kelson, 1994). Research findings have shown that the correct menu pricing for customers could impact on the choices they make. Yang et al. (2009) have concluded that there is a direct relationship between psychology and menu design. In other words, the kind of price and it's insert on the menu, has a significant relationship with the consumer buying behavior. The foods with high prices on the menu required more involvement attention on behalf of customers (Kim and kachersky 2006).

In a study conducted in 2007 by Anders, it has been found that the pricing in restaurant food menu is more influenced by their attitudes. For example, allocating decimal to price figures, can reduce the price elasticities for customers. There are some evidence of design financial techniques to enhance the consumer's attention, but did not prove any link between attention and buying behavior (Reynolds , 2005). Typefaces of prices also can affect customer. For example, when customers see a menu that its prices ends to zero are very eager than the times it ends to 9 (Nai paul، and Par sa, 2001).

Price information organization in a way that prices are arranged in descending order from low and minimum prices to high and the maximum prices, could lead consumers to spend less money (dayan and bar-hillel , 2011). In another view, descriptive labels can increase the number of purchased items and also customer satisfaction (Wansink , 2001).

in a survey conducted by the subject of evaluation the purchase behavior of food in supermarkets, it has been inferred that price offering based on location and size by using symbols can effect on any purchase behavior of self- aware consumers (miazaki et al. 2000). When the financial signs like the word "dollars" or "$" is used, the time spent by customers will significantly reduce. Also, a number of important differences between the numerical and written presentation format are obtained. (Yang, et al, 2009). According to the above mentioned cases about the importance of pricing on the menu and its impact on purchasing behavior, hypothesis number one obtained.

H1. Types of menu prices arrangement in an ascending, descending and selection order can affect the restaurant customers food choices.

Many restaurant menu designers have focused on providing content and calls for more attention to the food items writing on the menu. Increased awareness of the items in general, increases the likelihood of purchase by individuals (Carmin and Norkus, 1990; Reynolds et al., 2005). If the customers do not aware of a product existence, then they would not afford it. But in this case, the customer awareness of a product does not necessarily means the full percent tendency to buy the product.

The main focus of menu design is based on the increased attention and the importance of customer products. For example, one of suggestion to increase the attention to the content of the menu, is highlighting the upper and lower parts of the list of items (Hug and Warfel, 1991; Hunt-Wesson Foodservice, 1999; Stoner, 1986 Hopkins, 2005).

Menu design theory is suggested based on two well-known theories of psychology and cognitive science that are based on the von restroff position and effect (Ditmer and Griffin, 1994; Miller, 1992). There are many proposed techniques for increasing restaurant menus differentiation: Font colour (NRA, 2007) Decoration and imagination arrangement (Livingston, 1978) living show (pavestic, 1999) or highlighting divestible items (Panitz, 2000). Although there may be psychological principles behind the design of menus, but there are no fixed principles to design menus for increasing willingness to buy (Bowen and Morris, 1995;Gallup Report, 1987; Kincaid and Corsun, 2003; Reynolds et al.,2005). Researches conducted by eye tracking techniques have shown increasing desire to buy products that are less likely to remain in memory.

Yang's findings (2012) shows that customers in the time of reading the restaurant menu, doing a general survey on the list of foods (Yang, 2012). In other words, act like reading a book. he concluded that when the customerlooking at the menu taking a cursory glance from top to down from the first page and then looking at the top of the seconed page. From the findings of Yang (2012), Reynolds (2005) and Hopkins (2005) we can realize that due to the principle of customer perception effect about choose and buy, further pay attention to the menu arrangement based on main course and sub- course, the effect on choices will be greater. Therefore, according to the researchers findings about arrangement of the foods on the list of restaurant menu, hypothesis number two has been proposed:

H2. Inserting the restaurant main and special dishes in the beginning of the menu led to its selection by the customer.

Other research findings suggest that the visual impact on consumer choice, can so long prepare the human mind for the next selection. In studies conducted by Nicholas et al (2012) this issue is considered very well. They examined four food items namely, salads, meat, fish, desserts and found that as the the visual relationship between selected food on the menu and foods production place and their origin increase, the possibility of acceptance and selection on the menu by customers will be increase. In their research, for example, to raise the food choice motivation by customer, images related to fish and places for fishing, has been added to the restaurant background.

The reactions of the people and its impact on food choices along with a physical reminding of fishing equipment, etc., in choosing the fodders for fishes through (SOR) model are justified as involuntary and the incentive reaction of the organism.

Mandel and Johnson (2002) have confirmed this issue with well-established background related to stimulus and its impact on individual choices. Research carried out on menu arrangement has shown that the mental and conceptual presentation can effect on informational and behavioral process (Bargh et al., 1996). The behavior is affected by shown pictures in environments close to the person by using gift boxes placed in different shops (Perrine and Heather, 2000).

When the puppy pictures were displayed on the gift boxes, the demands for investment and fund for animal welfare organizations were increased (Mandel and Johnson, 2002).

Using background images related to the coastal areas and the sea on the restaurant menu, suggested that in the absence of the inducing stimulus, fish consumption has been increased significantly. But sometimes the images used related to the suburban areas such as the use of images of animals and landscape has slightly increased the meat consumption among consumers (Nicolas, 2012). Thus, considering the fact that images can affect foods consumption, hypothesis 3 can be proposed.

H3. The use of images associated with the main dishes on a restaurant menu Caused to more selection by customers.

The calorie information contribution is to prepare customers by giving them the information they need for healthier food choices (Taylor and Wilkening, 2008). A number of studies have reported little impact of giving information and calorie labels while other studies have reported non-impact. This results has been supported by Roberto et al (2009) and Leslie and Sorensen (2011) studies. Other research suggests that when the foods calorie information has been provided, women choose the one with fewer calories and a cheaper price. While the men have more simple choices. A possible reason for this, is that women use the calorie information to lose weight and the men use it to gain weight (Peggy et al, 2012).

In conjunction with the presentation of information about calories and how it affects the customer's choice, four types of calorie information presentation have been tested as 1) without calorie information labels, 2) with calorie labels, 3) rated calories, and 4) colour divided calories.

The results suggest that in all modes of calorie information presentations in comparison with without - calories information, the foods with fewer calories have been selected by customers. While the coloured and rated calories increases the effectiveness of the menu (Mary and Gerend, 2009). Using the colour scheme on menus guides the customers towards a healthier food selection. researchers were marked the foods in the self service tables with red and green light and found that the sale rates of beverages that were marked with green colour, has been increased and the sale rates of beverages that were marked with red colour, has been decreased (Thorndike et al, 2012).

However, studies have shown that at present the main cause of concern in developing countries is disregarding a proper diet and consequently obesity among the people. In this regard, Flegal et al and curtin (2012) along with Sturm (2012) believed that over 100 billion dollars are spended for obesity medical treatments in america, annually. Taylor & Wilkening (2008) studies have shown that the data associated with calorie foods can help consumers effectively to choose the foods they need. It is interesting that this information did not presented in the restaurants and food supply centers for unknown reasons (Roberto et al. 2009). But for now, the current policies in mentioned food supply places have changed and it is supposed that this information should be provided for customers clearly.

This study by taking advantage of studies, intended to put the calories information on the restaurant menu and evaluate the customer reaction. It should be noted that in a number of studies these information were placed next to the pos (Liu et al 2012). This is done along with law enforcement (new menu 2011). Although it has been concluded from Downs et al (2009) studies that displaying calories on restaurant menu does not have any effect on consumer choice behavior.

On the other hand, Bassett et al (2008) believed that this information have modest impact on reducing high-calorie foods, but the Roberto et al (2010) findings which is the basis of our study, reported a significant reduction in restaurant customer behavior to reduce the order. Grand (2009) have reached similar findings and have concluded that information presentations about calories in the time of buying fast foods, the foods that have warning state for customers, have a significant impact on reducing the purchase of these foods.

Therefore, hypothesis number four can be proposed as following:

H4. Determining the food with highest and lowest calorie on the restaurant menu can affect the choice of the food by customer.

Relationship with Hypothesis	Dimensions	research
H1	The impact of price on the menu	Kelson(1994)
		Yang et al (2009)
		Kim and kachersky(2006)
		Andrews(2007)
		Reynolds(2005)
		and Par sa,ʻNai paul(2001)
		dayan and bar-hillel(2011)
		Wansink(2001)
		miazaki et al(2000)
		Sybil S. Yang, Sheryl E. Kimes, M auro M. Sessarego(2009)
H2	Menu type arrangement	Carmin and Norkus(1990)
		Reynolds et al(2005)
		Hug and Warfel,(1991)
		Hunt-Wesson Foodservice(1999)
		Stoner(1986)
		Hopkins(2005)
		Ditmer and Griffin(1994)
		Miller(1992)
		National Restaurant Association [NRA](2007)
		Pavesic(2011)
		Sysco Food Service(2011)
		Bowen and Morris(1995)
		Gallup Report(1987)
		Kincaid and Corsun,(2003)
		Reynolds et al(2005)
		Yang(2012)
		Reynolds(2005)
		Hopkins(2005)
H3	Using watermark in menu	Nicolas Guéguena Céline Jacob , Renzo Ardiccioni(2012)
		Mandel and Johnson(2002)
		Feinberg(1986)
		bargh et al(1996)
		perrine and heather(2000)
H4	Showing calories on menu	Taylor &Wilkening(2008)
		Roberto, Agnew, & Brownell(2009)
		Leslie, & Sorensen(2011)
		Peggy J. Liu, Christina A. Roberto, Linda J. Liu, Kelly D. Brownell(2012)
		Mary A. Gerend(2009)
		Thorndike, Sonnenberg, Riis, Barraclough,& Levy(2012)
		Flegal et al . and curtin(2012)
		Sturm(2012)
		Taylor & Wilkening(2008)
		Roberto ʻAgnew & Brownell(2009)
		Liu et al(2012)
		Roberto, Larsen, Agnew, Baik, &Brownell(2010)
		Gerend(2009)

		Downs, Loewenstein, & Wisdom(2009)
		Elbel, Kersh,Brescoll, &Dixon(2009)
		Finkelstein, Strombotne, Chan, & Krieger(2011)
		Harnack et al(2008)
		Tandon et al(2011)
		Vadiveloo, Dixon, & Elbel(2011)
		Bassett et al(2008)
		Bollinger, Leslie, & Sorensen(2011)
		Burton, Creyer, Kees, & Huggins(2006)
		; Chu, Frongillo, Jones, & Kaye(2009)
		Pulos & Leng(2010)
		Tandon, Wright, Zhou, Rogers, &Christakis(2010)

METHODOLOGY:

The aim of of this study was to evaluate the effect of changes in restaurant menu design and its role on the customers choice behavior. in terms of implementation, this study is an empirical research. The population of this study includes customers of a restaurant in iran. The reason for this choice is that the customers in the restaurant, displays a more realistic behavior. The type of data collection was such that during almost a year, 5 different types of menu designed and each type implemented in 5 different weeks such that one normal menu implemented in one week and designed menus implemented in other weeks among 1000 persons.

In distribution of the menu, we note that to exclude the last days of the months and weeks because of individual multiple referral and the possibility of raising difficulties in the research process by executives. Design and implementation of menus was such that desired assumptions were applied by professional designers on the restaurant menu. After designing and printing menus, each one of them presented during 5 days and the required information were collected and analyzed.

ANALYSIS OF FINDINGS

Public and demographic data

In this study, almost 1,000 questionnaires were confirmed and used for data analysis.

the results showed that in nearly 1,000 respondents, 51.2% of them were men and 48.8% were women. 47.5% of considered respondents were between 20 and 30 years of age and 4.3% of considered respondents were below 20 years of age and 48.2% of individuals were above 30 years of age. In terms of marital status, 85% of them were married and 15% were single. in terms of education attainment, 31.8% earned diploma degrees, 9.8% earned associate's degrees, 40.6% earned bachelor's degrees, 5% earned master's degrees, and 20% of doctorates and higher degrees. Considering the occupational status, 2% were employee, 36.4% were self-employed, 6% were householder and retired, 0.5% were manager, 2.6% were professor at the university, 1.5% were physician, 0.5% were engineer and 32.5% had another jobs.

Table 2: statistics related to the sold food numbers of ordinary days and applied assumptions, separately

Elongation factor	Coefficient of skewness	maximum	The third quartile	median	First quartile	minimum	Standard deviation	Average	Hypothesis Test
2.011	1.335	338	288	222	178.5	171	65.58	231	The first hypothesis test
2.921	1.462	285	261	224	209	204	31.63	232.8	The Second hypothesis test
1.106	0.868	397	343.5	256	199	174	83.73	268.2	The third hypothesis test
-2.161	0.620	368	346	216	196	179	81.34	260	The third hypothesis test
8.692	2.331	892	283	198	150.5	7	167.2	221.6	The fourth hypothesis test, high- calories
1.968	1.51	471	166.5	93	48.8	3	119.2	132.1	The fourth hypothesis test low-calorie
-0.567	-0.259	177	168.5	151	124.5	115	23.86	147.4	Ordinary days

Table 3. Shapiro – Wilkie Test

Shapiro – Wilkie			Type of Hypothesis
Sig	Degrees of freedom	Statistic value	
0.980	5	0.990	Normal
0.343	5	0.887	The first hypothesis test
0.314	5	0.881	The seconed hypothesis test
0.814	5	0.961	The third hypothesis test with Iranian food images
0.299	5	0.878	The third hypothesis test with foreign food images
0.000	29	0.795	The fourth hypothesis test with a low-calorie food
0.002	22	0.839	The fourth hypothesis test with a high-calorie food

Table 4. Student's t-test

Sig	Degrees of freedom	Student's t-test statistics	Type of hypothesis test
0.028	8	2.679	The first hypothesis test
0.001	8	4.819	The seconed hypothesis test
0.015	8	3.103	The third hypothesis test with Iranian food images
0.034	4.683	2.970	The third hypothesis test with foreign food images

The first hypothesis test

To accomplish this, we do the following hypothesis test:

H0: μ_1=μ_2

H1: μ_1≠ μ_2

To accomplish the above test, we applied the method of mean comparison of two populations by using Student's t-test. First, we evaluate the normality assumption of food sale numbers related to first hypothesis and ordinary days.

The values of the shapiro – wilkie statistic and corresponding significant levels show that the distribution of food sale numbers related to the first assumption and ordinary days is normal, that is shown in table 3. Then we evaluate the covariance of food sale numbers distribution related to first hypothesis and ordinary days by Leven- Test, that value of the test statistic was equal to f=2.010 and significant level was equal to sig=0.194. And given that sig >0.05, H0 is not rejected at the 5% significance level, i.e. the distribution of food sale numbers related to first hypothesis and ordinary days are covariance. Since the variances are equal, so the t - student that is shown in the table 4, is used. Value of the test statistic is equal to t = 2.679 and the amount of significance level is equal to sig =0.028 and given that the sig <0.05, then H0 at significance level of 5% is rejected, i.e. average number of food sales related to first hypothesis and ordinary days is not equal, in other word, inserting the price of food on the menu in descending order had a significant effect on food sale numbers and caused to increase sales.

The second hypothesis test

To accomplish this, we do the following hypothesis test:

H0: μ_1=μ_2

H1: μ_1≠ μ_2

To accomplish the above test, we applied the method of mean comparison of two populations by using Student's t-test. First, we evaluate the normality assumption of food sale numbers related to seconed hypothesis and ordinary days. The values of the Shapiro – Wilkie statistic and corresponding significant levels show that the distribution of food sale numbers related to the seconed assumption and ordinary days is normal, that is shown in table 3. Then we evaluate the covariance of food sale numbers distribution related to seconed hypothesis and ordinary days by Leven- Test that value of the test statistic was equal to f=0.175 and significant level was equal to sig=0.678, and given that sig >0.05, H0 is not rejected at the 5% significance level, i.e. the distribution of food sale numbers related to seconed hypothesis and ordinary days are covariance. Since the variances are equal, so the t - student that is shown in the table 4, is used. Value of the test statistic is equal to t = 2.679 and the amount of significance level is equal to Sig =0.001 and given that the Sig <0.05, then H0 at significance level of 5% is rejected, i.e. average number of food sales related to seconed hypothesis and ordinary days is not equal, in other word, inserting special foods on the menu in a separate part had a significant effect on food sale numbers and caused to increase sales.

The third hypothesis test with Iranian food images:

To accomplish this, we do the following hypothesis test:

H0: μ_1=μ_2

H1: μ_1≠ μ_2

To accomplish the above test, we applied the method of mean comparison of two populations by using Student's t-test. First, we evaluate the normality assumption of food sale numbers related to third hypothesis and ordinary days. The values of the Shapiro – Wilkie statistic and corresponding significant levels show that the distribution of food sale numbers related to the third assumption and ordinary days is normal, that is shown in table 3. Then we evaluate the covariance of food sale numbers Distribution related to third hypothesis and ordinary days by Leven- Test, that Value of the test statistic was equal to F=3.349 and significant level was equal to sig=0.105, and given that Sig >0.05, H0 is not rejected at the 5% significance level, i.e. the distribution of food sale numbers related to third hypothesis and ordinary days are covariance. Since the variances are equal, so the t - student that is shown in the table 4, is used. Value of the test statistic is equal to t = 3.103 and the amount of significance level is equal to Sig =0.015 and given that the Sig <0.05, then H0 at significance level of 5% is rejected, i.e. average number of food sales related to third hypothesis and ordinary days is not equal, in other word, inserting the Iranian food images on the menu had a significant effect on food sale numbers and caused to increase sales.

The third hypothesis test with foreign food images:

To accomplish this, we do the following hypothesis test:

H0: μ_1=μ_2

H1: μ_1≠ μ_2

To accomplish the above test, we applied the method of mean comparison of two populations by using student's t-test. First, we evaluate the normality assumption of food sale numbers related to third hypothesis and ordinary days. The values of the Shapiro – Wilkie statistic and corresponding significant levels show that the distribution of food sale numbers related to the third assumption and ordinary days is normal, that is shown in table 3. Then we evaluate the covariance of food sale numbers distribution related to third hypothesis and ordinary days by Leven- Test, that value of the test statistic was equal to F=14.999 and significant level was equal to Sig=0.005, and given that Sig >0.05, H0 is rejected at the 5% significance level, i.e. the distribution of food sale numbers related to third hypothesis and ordinary days are not covariance thereby we can't use normal t - student test, so the t - student test that is shown in table 4, is used. Value of the test statistic is equal to t = 2.970 and the amount of significance level is equal to Sig =0.034 and Given that the Sig <0.05, then H0 at significance level of 5% is rejected, i.e. average number of food sales related to third hypothesis and ordinary days is not equal, in other word, placing the Iranian food images on the menu had a significant effect on food sale numbers and caused to increase sales.

The fourth hypothesis test:

To accomplish this, we do the following hypothesis test:

H0: μ_1=μ_2

H1: μ_1≠ μ_2

To accomplish the above test, we applied the method of mean comparison of two population by using Student's t-test. First, we evaluate the normality assumption of food sale numbers as low and – high. The values of the Shapiro – Wilkie statistic and corresponding significant levels show that the distribution of food sale numbers in two group, low and high calorie, are not normal so the t- student's test can't be used, and we should use non- parametric tests thereby we use Yoman- Whitney test, which the results are as follows:

Table5. Yoman- Whitney test results

Ranks				
	Calorie	N	Mean Rank	Sum of Ranks
Total sale numbers	Low	22	20.02	440.50
	High	29	30.53	885.50
	Total	51		

By observing the ranks mean values, we estimate that the number of low-calorie food sales during the study was higher than the number of high-calorie food sales. To ensure that our estimation is true, we performed the Yoman- Whitney test, which it's results is as following:

	Total number of sales
Mann0 Whitney U	187.500
Wilcoxon W	440.500
Z	-2.501
Asymp.Sig. (2-tailed)	.012

Grouping Variable: calorie

Value of the test statistic was equal to U=187.5 and and given that z = -2.501 and Sig < 0.05, then H0 at significance level of 5% is rejected, i.e. average number of low- calorie food sales during the study was higher than high calorie ones.

CONCLUSION

This research finding suggests that changes in the menu at the restaurant and especially in the desired restaurant had great impacts on the food choice behavior of the customer. The purpose of this study, based on studies conducted by researchers, was that to make changes on the menu in restaurant, and if this changes make any changes in the choice behavior of customer, evaluate the the changes. Changes on what the customer sees and which is the only reference for his/her decision making, follows behavioral theories.

Usually, customers which go to a restaurant, have distinct purposes. They expect that when they are in that palce, have a desirable serving status in terms of serving foods. According to this study finding, customers can change their behavior under the influence of menu design. in the first hypothesis, we emphasized on the fact that in the time of choosing the food, customer can forget the price as the most critical element in marketing, and because the menu was designed by price descending order, customer can choose the food in top of the menu, thereby sales amount compared to the previous, has increased.

Meanwhile, Yang et al (2009) have confirmed these results. in other words, people have a cursory look at the menus and does not take much analysis. in the next test, the purpose is to contribute the foods separator factor on the menu. in this section, we decided to show the foods which specified by the chefs as special on the menu more prominently.

According to the restaurant owners statements and the collected data, the sale of this type of foods have changed greatly and showed great increses. To evaluate the effect of disposable food in the restaurant, the menu was divided into two parts:

The first part of the menu was associated with Iranian food images and the seconed part was associated with images of foreign places and objects. In both cases, the impact was enormous and about 2 times the amount found in a normal day. This status was greater for Iranian foods that were due to cultural homogeneity with customer's imaginations. The last objective of this research was to study the impact of inserting the calorie content of the food on the menu and assess its impact on the customer's choice. This study has shown that after making any necessary modifications to customers, the average high-calorie food seles is different with average low-calorie food seles. In other words, when customer sees the calorie content of the food on the menu, may experienced obsession and order fewer high- calorie foods. Tests show that the average numbers of low calorie meals are more than high- calorie meals. The results of this study are conformed with Gerend (2009), Taylor and Wilkening (2008), Wellesley and Leslie, & Sorensen (2011) study.

MANAGEMENT APPLICATIONS

the results of this empirical research has shown that when managers of catering centers want to affect customer behavior, it is sufficient to pre-define the type of treatment with customer by using accepted scientific principles and theories related to customer behavior.

This study revealed that how manipulating a few very simple but crucial variable on the menu of a restaurant with a history of more than ten years, has greatly affected all the traditional equations. Professionals in the field of design and painting were employed to design the restaurant menu. Researcher's ideas for this study were derived from various studies that each one of these researchers examined and measured one of the ideas and its effects.

We showed that how can affect a restaurant customer's behavior in food choices by a survey of 1000 of customers. Restaurant managers by observing the results, are very eagered that this study be carry out to investigate other variables in that place.

In Their remarks on qualitative interviews that have been conducted, expressed that new menus have changed each customer behavior and in some cases

raised the restaurant earnings up to more than two-fold.

It is suggested that these changes on menu be adopted in other entertainment places and the time has been spent for customers and these changes be calculated. In order to further exploit the reinforcing models of consumer behavior, menus can be provided electronically, and instead of displaying static images, short films or music related to offered foods on the electronical menu, be adopted. It seems that these changes should be based on a codified plan. Because it is possible that another factors such as cultural heterogeneity, intense effet of price or calorie on customer did't controlled properly and have a inverse effects on the restaurant's reputation and cause to customer reduction. Therefore it is recommended that menus be designed by those who familiar with the Food issues and should be careful in doing the tests that menus don't have much changes in successive days and weeks to prevent negative impacts on existing customers and the customer do not feel that experimenting a test. Also, It is suggested that during the test, avoid of placing the signs of other factors affecting the restaurant. Another important thing is that All variables should not be apply Simultaneously, such that the managers could properly recognize the factor impact.

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