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Moderating roles of customer characteristics on the link between service factors and satisfaction in a buffet restaurant

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Abstract

Purpose – In service sector, measuring quality of services is generally acknowledged to be difficult as it involves many psychological features. Hence, identifying the determinants of service quality and linkages with customer satisfaction is a challenging research topic. In this study, the authors take up a research study to address this challenge. The purpose of this paper is to examine the importance of factors influencing customer satisfaction in the context of a Chinese buffet restaurant in the UK.

Design/methodology/approach – The authors use a questionnaire based on the SERVQUAL instrument for the purpose. Using exploratory and confirmatory factor analyses, the authors have found that service quality could be grouped into four main factors – service, food, ambience and price.

Findings – Using multiple-regression analysis, the authors have found that food is the most significant factor influencing customer satisfaction, followed by price, ambience and service, respectively. Using a multi-group analysis, the authors have found interesting moderating roles of age, gender and annual income on the influence of the four factors on satisfaction: ambience is considered significant by male customers while it is not significant for female customers; the influence of price on satisfaction is much higher for female customers than for male customers; food and service factors are important for younger customers while price is important for older customers; price is important for customers with lower levels of income but not important for high-income customers.

Practical implications – These results are useful to restaurant managers in allocating appropriate levels of resources to different factors based on their contributions to customer satisfaction in order to maximize customer satisfaction efficiently and effectively.

Originality/value – Analysis and findings of this research are based on the customers' survey data of a Chinese buffet restaurant in the UK. The authors have found an interesting ranking of the importance of service factors: food followed by price, ambience and service. The results on the moderating role of customer characteristics provide newer insights in the literature on service quality. The research findings can help the hotel management to improve their service levels to attain maximum customer satisfaction.

Keywords SERVQUAL, Service quality, Customer satisfaction, Buffet restaurant

Paper type Research paper

1. Introduction

Available data indicates that the service sector is growing faster than the manufacturing sector. The share of the service sector is larger in more developed economies (Fitzsimmons and Fitzsimmons, 2008). According to Wirtz *et al.* (2015) who used data from the World Bank and World Trade Organization, the share of service sector in the world economy

was over 70 per cent and it was 73 per cent in the developed economies. This sector is also set to grow further in the future. Hence, it is important to pay special attention to the characteristics of the service sector and also to the customers' feelings that distinguish it from traditional manufacturing (Lee, 2009). Services, compared to manufacturing, involve the conversion of resources into an "intangible" output (Adam and Swamidass, 1989). Service operations are distinguished by the following major characteristics: customer participation, simultaneity, perishability, intangibility and heterogeneity (Fitzsimmons and Fitzsimmons, 2008). Due to the closeness of the service business to customers, service operations must be extremely sensitive to customers and markets (Adam and Swamidass, 1989) and achieving customer satisfaction is a challenge in the service sector.

Due to the distinct characteristics of the service sector, measuring quality of services is generally acknowledged to be more difficult as it involves many psychological features (Fitzsimmons and Fitzsimmons, 2008). Hence, identifying the determinants of service quality and linkages with customer satisfaction is a challenging research topic. In this study, we take up a research study to address this challenge. Specifically, we examine the importance of factors influencing customer satisfaction in the context of a Chinese buffet restaurant in the UK.

The restaurant sector is one of the fastest and consistently growing service sectors in the UK. Turnover in the UK restaurant sector reached £21.6 bn in 2014, up from £15.5 bn in 2010, registering an impressive increase by 39 per cent during this period (Shubber, 2015) in spite of economic downturn. Customers in the UK on an average spend 27 per cent of their weekly food budget on eating out in restaurants, which are the preferred meal destinations followed by pubs and fast-food outlets. Such a sharp growth of the restaurant sector can be attributed to a great extent to changing lifestyles and improving economic conditions in the UK. This level of growth has also increased competition in restaurants in attracting customers, and the importance of improving service quality has been recognized in the literature as vital for attracting customers (Robledo, 2001).

This study focuses on service quality in restaurants. Usually, perceived quality has been regarded as one of the most significant determinants of customer satisfaction in the service industry (Namkung and Jang, 2008). For the specific restaurant context, perceived quality can be further decomposed into sub-factors, for example, into food quality, service quality, ambience quality, price, etc. We explore the relationships of these factors in influencing customer satisfaction in this paper. More specifically, the objectives of this study are: first, to identify important attributes influencing customer satisfaction in restaurants based on previous studies; second, to evaluate customers' perceptions with respect to the performance of these attributes; third, to check whether these attributes could be grouped into meaningful factors; fourth, to prioritize those factors based on their influencing power on improving customer satisfaction; and fifth, to identify the moderating influence of various customer characteristics on the influence of customer-service factors on satisfaction.

This paper is organized as follows. We review the related literature and develop hypotheses in the next section. We describe our research methodology in Section 3. Data analysis and results are presented in Section 4. Results of the analysis are further discussed in Section 5, where important managerial implications of the results are also discussed and finally, conclusions and research limitations are presented.

2. Literature review and hypothesis development
2.1 Service quality and measurement
Service quality is usually based on the assessment of customers in relation to overall excellence or superiority of the service provided (Parasuraman *et al.*, 1988). It is

commonly recognized as a multi-dimensional construct. In spite of newer ways of measuring service quality for example using AHP and Topsis methods (e.g. Ramanathan and Karpuzcu, 2011; Yildiz and Yildiz, 2015), a majority of studies on service quality builds on the SERVQUAL instrument developed by Parasuraman *et al.* (1988) as it provides an interesting way of measuring the multiple dimensions of service quality. The SERVQUAL instrument is based on measuring expected service quality, measuring perceived service quality and identifying the difference between the two. The instrument has been applied in different service sectors (hotels, restaurants, airlines, etc.). However, more recent literature has used variations of this instrument. For example, there is a view that perception based parts are more important in the SERVQUAL instrument (Roses *et al.*, 2009). Though the causal relationship between restaurants quality and customer satisfaction been accepted in theory, not many studies have verified this relationship in restaurant industry in a practical context (Lin *et al.*, 2010; Cao and Kim, 2015). With the purpose of filling the gap, this study intends to examine the correlation between perceived restaurant quality and customer satisfaction. Further, though there is a general agreement that the relationship between service factors and satisfaction could vary depending on specific characteristics of customers, there are relatively few studies that have empirically analysed this influence. We attempt to fill this gap as well.

2.2 Attributes influencing customer satisfaction in restaurants

Reuland *et al.* (1985) claimed that the hospitality industry is a harmonious mixture combining three factors: the material product, the behaviour and attitude of service providers and the environment. Berry *et al.* (2002) also suggested that the service experience can be described from three categorized elements: technical quality of service, behaviour of employees and elements in the service environment. With particular reference to the context of restaurants, Clark and Wood (1999) asserted that "meal experience" was a holistic abstraction of multiple factors (food, price and atmosphere) in consumers' mind. This view has been verified in subsequent studies (e.g, Robledo, 2001), and the present study also takes a similar approach, dividing overall service quality of a restaurant into food, service, ambience and price. The literature also calls for focusing on special attributes of special cases in evaluating overall service quality, and the present study contributes to this literature by focusing on special attributes of Chinese buffet restaurants.

2.2.1 Food. Food quality has been viewed as a major criterion for patrons to judge performance of restaurants. Soriano (2002) investigated an up-scale Spanish restaurant and indicated that respondents rated food quality as the most vital element of the restaurant. Johns and Pine (2002) felt that low price and high food quality, evaluated using food temperature, presentation, freshness and selection range, could be important factors for success of restaurants. Wansink (2005) has found that patrons regarded appearance of a dish as very important for their dining experience. Food safety has been regarded as a basic requirement by customers when measuring food quality (Sulek and Hensley, 2004). Healthy food is one of the qualities to measure food in restaurants. With a growing number of experienced patrons, attractiveness has become a vital criterion when consumers evaluate performance of restaurants (Kivela, 1997). As one component of attractiveness, some scholars suggested that new dining experiences should be provided by restaurants through offering unique dishes and revising cuisines regularly (Lin and Mattila, 2006).

Perceived food quality has been regarded as one of candidates that results in customer satisfaction in restaurant setting (Law *et al.*, 2004; Johns and Howard, 1998). Accordingly, the relationship between food quality and customer satisfaction is posited as our first hypothesis:

H1. Food quality positively and significantly influences customer satisfaction in restaurants.

2.2.2 Service. Restaurants offer both food and service. Thus customers in a restaurant not only experience the taste of food but also experience service encounters during their meal. Pugh (2001) claimed that positive emotions by customers have positive effects on their perceptions of service quality. For instance, waiters should be able to provide prompt and convenient payment. If there are problems due to incorrect billing, long waiting time to pay and ignorance of servers, the entire dining experience could be ruined even if the meal itself was viewed as perfect by patrons (Pugh, 2001). In the context of a buffet restaurant, this positive emotion can also be experienced when dishes are replenished regularly and used plates are withdrawn promptly. Meanwhile, researchers have pointed out that honouring customers reservations correctly is a requirement criterion for patrons to perceive good service quality (Lee and Hing, 1995). Accessible location and convenient operating time are vital attributes considered by experienced customers when choosing restaurant (Soriano, 2002; Tzeng *et al.*, 2002)

Since customers participative in the entire service providing process in a restaurant, the ability of service personnel in communicating with consumers without difficulties is important for customers' perceptions of service quality. This is especially vital for Chinese restaurants. Law *et al.* (2008) investigated the Mainland Chinese travellers' perceptions in terms of their dining experiences in Hong Kong restaurants. And the results showed that many respondents have unsatisfied meal experiences due to the difficulties in communicating with servers. Therefore, the servers' language proficiency is an essential attribute which has influence on customers' perceptions of restaurant's performance.

Wansink *et al.* (2005) pointed out that consumers could generate some favourable comments for the labelled dishes. For instance, if cooking method of the dish is labelled in detail, patrons intend to think it is more appealing and tasty than other dishes without labelling. It is particularly important for specialty restaurants such as Chinese restaurants, since some patrons are unfamiliar with Chinese cuisines. If detailed information of dishes (such as calorie and nutrition level, involved ingredients, warning labels, cooking method) is offered inside of the restaurant or on its website, consumers could generate positive evaluations for the restaurant's service quality. The similar positive measurement could be obtained through clearly labelled signs in different buffet sections.

Thus, consistent with the converging proposition that a good quality customer-service results in customer satisfaction, the second hypothesis in this study is that:

H2. Quality of customer service positively and significantly influences customer satisfaction.

2.2.3 Ambience. Substantial studies have agreed on the significance of environment attributes, and even implied them as one of the essential cues for patrons to judge performance of restaurants. For example, Rust and Oliver (1994) claimed that customers make judgements about overall service quality of restaurants based on their

assessment of physical attributes. Mattila (2001) concluded that atmosphere is a crucial influencing factor of customers dining experiences. Bitner (1992) proposed that the ambience of restaurants is one kind of non-verbal communication with consumers. Moreover, Bitner (1992) asserted that the positive effect of a good tangible service environment could compensate for the negative feelings generated by a poor intangible service. Kaplan and Kaplan (1989) and Bitner (1992) pointed out that the ambience elicits cognitive responses such as perceived service quality, which affect customers' assessment of the products and personnel in that place. Soriano (2002) found that the attention in terms of the relationship between detailed ambience attributes (i.e. hygienic and harmonious eating environment, suitable layout arrangement) and perceived service quality has been developing in the past two decades. Wakefield and Blodgett (1999) investigated the function of cleanliness in leisure service settings. Ryu and Jang (2007) found that there was high correlation between spatial layouts (i.e. equipments, furnishings) and perceived service quality in an up-scale restaurant. Newman (2007) proposed the effect of spatial density on the evaluations of service quality. In addition, Stokols (1972) claimed that highly dense setting conditions could lead to poor perceptions of over crowing by patrons, which in turn make them feel that their personal space is limited and threatened. A similar result has been reported by Yildirim and Akalin-Baskaya (2007). They tested 465 patrons in a single restaurant and concluded that patrons perceived better service quality when the restaurant is less crowded. In empirical studies, substantial researchers suggested that ambience quality is very important in indicating customer satisfaction (Clark and Wood, 1999; Namkung and Jang, 2008; Kim and Moon, 2009). Consistent with these findings, we develop our third hypothesis:

H3. Ambience quality positively and significantly influences customer satisfaction.

2.2.4 Price. Besides food, service and ambience attributes, price has been identified as another attribute that affects customers perceptions of restaurants performance largely. Scholars have claimed that the price could be as a surrogate for quality (Olson, 1977). A related criterion is price fairness. It refers to the extent to which patrons evaluate price is reasonable, acceptable and just right (Bolton *et al.*, 2003). As the booming restaurant market supplies a variety of selections for patrons, and as dining out becomes an integral part of the daily lifestyle, consumers tend to be more experienced and have the motivation to seek a better value for their consumption (Klara, 2001). Accordingly, high quality of food and service are not enough for customers to evaluate the restaurants performance. In their mind, the value of their money is demanded (Teboul, 1991). Price also plays a key role in indicating customer satisfaction due to its ability of attracting or repelling customers (Fornell *et al.*, 1996). Our fourth hypothesis is consistent with this literature:

H4. Price perception positively and significantly influences customer satisfaction.

2.2.5 Overall customer satisfaction. Intentions of future purchases by consumers are often shaped by their previous purchasing experiences (Colgate and Lang, 2001; Iglesias and Guillen, 2004). Hansen *et al.* (2004) proposed that instead of telling their compliments to the firm, the satisfied consumers are more likely to share their satisfied experiences with others. In the restaurant context, customer satisfaction could be explained as the motivation of patrons to revisit a specific restaurant and to

recommend it to their family, friends and others in the future. Thus, in this study, customer satisfaction is measured in terms of the customers' intention to revisit the restaurant again and their willingness to recommend the restaurant to friends (Colgate and Lang, 2001; Hansen *et al.*, 2004; Iglesias and Guillen, 2004).

2.2.6 Customer characteristics as moderators. It has generally been observed that the relationships between service quality attributes and overall satisfaction could be influenced by certain characteristics of customers. The theory of consumer behaviour (Holbrook, 1995) predicts that different personal characteristics of customers influence customers purchasing behaviour in any shopping environment. This has also been verified empirically. For example, factors such as gender, education and income have been found to affect purchase behaviour of customers (Slama and Tashchian, 1985). In the context of restaurants, Chow *et al.* (2007) have found that gender, age and income level of consumers affected their repeat purchase intention. In contrast, some other researchers studied such moderating influences but did not find satisfactory evidence. For example, Soriano (2002) has investigated customer satisfaction in Spanish restaurants, and concluded that satisfaction levels did not significantly vary between male and female customers. Namkung and Jang (2008) observed four restaurants (two are American restaurants, others are Korean restaurant and Japanese restaurant), and claimed that no significant differences existed between satisfied and non-satisfied customers in terms of age and annual household income. Thus, the moderating influence of customer characteristics on service quality is not a conclusive one. In this study, we provide another test of customer characteristics by stating our final hypothesis:

H5. Customer characteristics (age, gender and income level) significantly influence the relationships between service quality attributes and customer satisfaction.

All posited hypotheses in this study are sketched in Figure 1.

3. Research methodology – questionnaire design and data collection
A self-administered questionnaire was designed in order to gather primary data. A review of academic studies and commercial research with respect to restaurants overall service quality, and the predictors of customer satisfaction were applied as support. The final questionnaire comprised 33 items, and it was divided into four parts. Table I provides the 33 items along with the literature sources.

In the introductory part of the questionnaire, the purpose of this survey was asked. In the second part, the questionnaire required respondents to indicate their personal
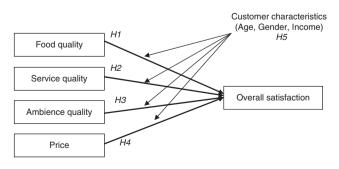

Figure 1.
Hypothesized research model for the restaurant

Attribute	Source
Food-related attributes (11 items)	
Temperature, accessibility, presentation freshness variety (Q10)	Soriano (2002) and Johns and Pine (2002)
Safety	Sulek and Hensley (2004)
Health (low-calorie dishes and vegetarian options)	Schifferstein and Oude Ophuis (1998)
Food innovation and uniqueness	Auty (1992) and Lin and Mattila (2006)
Authenticity and localization	Ebster and Guist (2004)
Service-related attributes (12 items)	
Replenishment of dishes plates withdrawal, error-free billing	Pugh (2001)
Reservation honoured, reservation via internet	Lee and Hing (1995)
Language communication	Law *et al.* (2008)
Dishes' information labelled, separating and signing buffet sections (Q18), information on the website (Q21)	Wansink and Cheney (2005)
Operating time, location, individual service	Soriano (2002) and Tzeng *et al.* (2002)
Ambience-related attributes (4 items)	
Cleanliness	Soriano (2002)
Queue near meals	Davis and Heineke (1994) and
Waiting room availability	Law *et al.* (2004)
Seating arrangement	Soriano (2002), Ryu and Jang (2007), Newman (2007), Stokols (1972) and Yildirim and Akalin-Baskaya (2007)
Price-related attributes (3 items)	
Worthy price, discount price for students (Q29), differed price for different time periods (Q30)	Bolton *et al.* (2003), Klara (2001) and Teboul (1991)
Satisfaction-related attributes (3 items)	
Customer satisfaction, return again, recommend to friends	Colgate and Lang (2001), Iglesias and Guillen (2004) and Hansen *et al.* (2005)

Table I.
Literature sources
for the questions
used in the
questionnaire

information, consisting of gender, age and monthly income. These are the most generally applied demographic attributes in the operations service industry research (Weber, 2005).

In the content page, some instructions about how to answer the questions were first provided. Then respondents were asked to measure overall service quality provided by the restaurant through 30 questions listed in section 1. This formed the third part of the questionnaire. In section 2 (which formed the fourth part of the questionnaire), respondents were asked to evaluate their overall satisfaction with the restaurant.

This study has used performance-only measurement instead of traditional SERVQUAL instrument, which is in line with some recent observations (e.g. Roses *et al.*, 2009). A seven-point Likert-type scale was utilized, which ranged from 1 = strongly disagree to 7 = strongly agree. Respondents were asked to rate the score for all attributes. The questionnaire was designed in English and Chinese. Each attribute was first stated in English and was then translated into corresponding Chinese. Taking into consideration that a majority of patrons of the restaurant are Chinese, the Chinese-stated part of the questionnaire can help them better understand. In this sense, more respondents can take part in this survey. Thereby, the applicability and reliability of the analysis results would be improved.

In order to ensure the validity of content, questionnaire was pilot-tested by nine Chinese and 16 English respondents. After accounting for their comments, a large-scale survey was performed in the next three weeks. Random sampling was used for questionnaire survey. The respondents who were waiting for check out were randomly selected. One of the authors read the statements for respondents and marked in the questionnaire on behalf of the respondents. The majority of questionnaires were selected through this way. And a minor of questionnaires were filled out by respondents in person. For the sake of ensuring the variety of respondents, only the leader of each group was chosen, and without discrimination in terms of gender, age or monthly income level when selected. Respondents participated in the survey on a voluntary basis. A total of 204 completed questionnaires were received, all of them were used in the data analysis.

4. Data analysis and results
A series of different statistical analysis were performed to analyse the questionnaire data. The software, SPSS 16.0, was employed for the purpose.

4.1 Demographic and dining out profiles
Table II reports the total of 204 respondents demographic and dining out profiles in detail. Among respondents, 45.1 per cent were male, and the rest were female. The majority age of respondents ranged from 31 to 40. The largest proportion of respondents monthly income ranged from £2,000 to £3,000. The major respondents dine out one or two times weekly (53.4 per cent).

Characteristic	Category	Number	%
Gender	Male	92	45.1
	Female	112	54.9
Age	20 or below	1	0.5
	21-30	51	25.0
	31-40	59	28.9
	41-50	43	21.1
	51-60	21	10.3
	61 or above	29	14.2
Monthly income	Less than £1,000	24	11.8
	£1,000-£2,000	11	5.4
	£2,000-£3,000	62	30.4
	£3,000-£4,000	48	23.5
	£4,000-£5,000	59	28.9
Group visiting	Alone	17	8.3
	Family	65	31.9
	Friends	96	47.1
	Business colleagues	26	12.7
Frequency of dining out	Almost never	1	0.5
	One or two times	109	53.4
	Three or four times	80	39.2
	More than five times	14	6.9
Frequency of visit	Once	187	91.7
	Two times	15	7.4
	Three times	2	1.0

Note: $n = 204$

Table II.
Demographic and dining out profiles of respondents

4.2 Descriptive statistics

The descriptive statistics is presented in Table III. It can be seen from this table that the majority of items were rated highly by patrons, varied from score 4 to 7. The mean scores were around 5. These values imply the fact that patrons evaluate overall service quality of the restaurant at a rather high level, and they are generally with the service provided by the restaurant. On the contrary, customized service (measured in terms of pay attention to customers specific requirements) (ranging from score 2 to 5) and ambience-related attributes (ranging from score 3 to 7) showed comparatively lower evaluations.

4.3 Factor analysis

We first employed exploratory factor analysis to analyse the data. Factor analysis is able to narrow down the substantial numbers of attributes and group them into factors. Principal component analysis with a varimax rotation method was utilized and factor loadings above 0.4 without cross-loaded was considered (Van Dyke *et al.*, 1999). A confirmatory factor analysis was subsequently undertaken and the results are

No.	Item	*n*	Min	Max	Mean	SD
1	Food temperature	204	4	7	5.49	0.803
2	Food accessibility	204	4	7	5.35	0.900
3	Food presentation	204	4	7	5.50	0.785
4	Food freshness	204	4	7	5.54	0.821
5	Food safety	204	4	7	5.57	0.888
6	Low-calorie dishes	204	4	7	5.63	0.966
7	Vegetarian dishes	204	4	7	5.76	0.908
8	Food innovation	204	4	7	5.57	0.842
9	Food uniqueness	204	4	7	5.55	0.820
10	Food variety	204	4	7	5.60	0.868
11	Food authenticity and localization	204	4	7	5.80	0.803
12	Replenishment of dishes	204	4	7	5.16	0.853
13	Plates withdrawal	204	4	7	5.08	0.867
14	Reservation honoured	204	4	7	5.22	0.896
15	Error-free billing	204	4	7	5.17	0.874
16	Language communication	204	4	7	5.16	0.898
17	Dishes information labelled	204	4	7	5.26	0.893
18	Separating and signing buffet sections	204	4	7	5.16	0.891
19	Operating time	204	4	7	5.51	0.890
20	Location	204	4	7	5.46	0.856
21	Website information	204	4	7	5.38	0.910
22	Website reservation	204	4	7	5.52	0.739
23	Customized service	204	2	5	3.49	0.857
24	Cleanliness	204	3	7	5.02	0.893
25	Queue near meals	204	3	7	4.74	1.002
26	Waiting room availability	204	3	7	4.65	0.877
27	Seating arrangement	204	3	7	4.82	0.909
28	Worthy price	204	4	7	5.47	0.833
29	Discount price for students	204	4	7	5.65	0.900
30	Differed price for different time periods	204	4	7	5.80	0.809
31	Customer satisfaction	204	4	7	5.61	0.790
32	Return again	204	4	7	5.56	0.866
33	Recommend to friends	204	4	7	5.69	0.842

Table III.
Descriptive statistics of questionnaire items

available in Table IV. In total, 18 items loaded into four latent factors with an eigenvalue greater than 1. The reliability of the latent factors was tested using Cronbach's α. It can be seen from Table IV that the Cronbachs α of four factors (ranged from 0.649 to 0.866) are higher than the acceptable value 0.60 (Nunnally, 1978).

Table V reports the correlation between factors – food, service, ambience, price and overall satisfaction. Many of the correlations reported in the table are significant.

4.4 Multiple-regression analysis

We have used multiple-regression analysis to test our hypotheses. Accordingly, the structure of multiple-regression can be expressed as following: overall satisfaction = f (food factor, service factor, ambience factor, price factor) (Hair *et al.*, 2006). In this regression equation, four factors are the independent variables and overall satisfaction is the dependent variable. The results of regression analysis are displayed in Table VI.

We checked for the presence of multi-collinearity and heteroskedasticity that could potentially violate the assumptions of ordinary least squares regression (Hair *et al.*,

	Cronbachs α	% of variance	KMO statistics
Food factor (4 items):	0.649	49.008	0.702
Food presentation			
Food safety			
Vegetarian dishes			
Authenticity and localization			
Service factor (7 items):	0.834	51.381	0.870
Plates withdrawal			
Language communication			
Dishes information labelled			
Operating time			
Location			
Website information			
Website reservation			
Ambience factor (4 items):	0.866	71.645	0.831
Cleanliness			
Queue near meals			
Waiting room availability			
Seating arrangement			
Price factor (3 items):	0.797	71.492	0.629
Worthy price			
Discount price for students			
Differed price for different time periods			

Table IV.
Results of confirmatory factor analysis of questionnaire data

	Food factor	Service factor	Ambience factor	Price factor
Service factor	−0.096			
Ambience factor	−0.074	−0.228[**]		
Price factor	−0.010	−0.409[**]	−0.161[*]	
Overall satisfaction	0.256[**]	0.109	−0.268[**]	0.253[**]

Notes: *,**Correlation significant at 0.05 and 0.01 level (two-tailed), respectively

Table V.
Correlation matrix of questionnaire data

2006). Values of variable inflation factors were all below 10 indicating that multi-collinearity was not a problem. The graph of residuals showed no specific pattern, indicating no problems with heteroskedasticity. The results in Table VI show that the four factors contributed significantly ($F = 13.569$, $p < 0.01$) and explained 19.9 per cent of the variance in overall satisfaction (Adjusted $R^2 = 0.199$).

We can use the results of regression in Table VI to verify our first four hypotheses. This testing is described in Table VII. Thus, all the four factors significantly affect overall satisfaction. At the level of $p = 0.000$, food factor presents positive and the closest relationship with overall satisfaction. It means that food factor is the most significant indicator of overall satisfaction. Hence, H1 which posits positive and significant relationship between food factor and overall satisfaction is supported. Similarly, price factor shows positive and significant relationship with overall satisfaction as well ($p = 0.001$). Therefore, H4 which infers positive and significant relationship between price factor and overall satisfaction is supported. Though ambience factor significantly affects overall satisfaction ($p = 0.003$), it represents negative relationship with overall satisfaction. Thus, H3 which investigates a positive and significant relationship between ambience factor and overall satisfaction is only partially supported. This negative relationship implies – although customers measure ambience quality of the restaurant is low, they still evaluate a high level of satisfaction with respect to the restaurants overall service quality. The manager should pay more attention in ambience quality, since it has a significant effect on overall satisfaction.

Finally, compared with other three factors, service factor has a lower level ($p = 0.043$) of significance in explaining the overall satisfaction. However, it still has a significant and positive effect on overall satisfaction. Accordingly, H2 which posits the positive and significant relationship between service factor and overall satisfaction is supported.

Thus the food factor has the most significant impact on overall satisfaction, followed by price, ambience and service, respectively.

4.4.1 Multi-group Analysis. To test the moderating impacts of gender, age and monthly income, we have divided our sample into multiple groups in terms of these variables and performed multiple regression analysis for each group. This way of

	Standardized coefficients β	R^2	Adjusted R^2	F
Food factor	0.300**	0.214	0.199	13.569**
Service factor	0.150*			
Ambience factor	−0.204**			
Price factor	0.248**			

Notes: [a]Dependent variable: overall satisfaction. *,**Correlation significant at 0.05 and 0.01 level (two-tailed), respectively

Table VI.
Regression results[a]

Hypothesis	Relationship with overall satisfaction		Testing result
H1. Food	Positive	Highest significance ($p = 0.000$)	Supported
H2. Service	Positive	Fourth significance ($p = 0.043$)	Supported
H3. Ambience	Negative	Third significance ($p = 0.003$)	Partially Supported
H4. Price	Positive	Second significance ($p = 0.001$)	Supported

Table VII.
Results of
hypothesis testing

multi-group regression analysis is consistent with the literature (e.g. Gilbert *et al.*, 2015). Results are shown in Table VIII.

Gender seems to moderate the importance of food factor, service factor and ambience factor on overall satisfaction (Table VIII). The most notable difference is on the relationship between ambience factor and overall satisfaction. For males, ambience is negatively but significantly related to satisfaction while the factor does not have significant impact for the satisfaction of female patrons. This result is consistent with those of Chow *et al.* (2007), who asserted that male patrons have commonly higher expectations of service quality, and are especially concerned with physical environment of the restaurant.

The results of Table VIII also show that the influence of the four factors on satisfaction significantly differed for patrons of different age groups. Thus a strong moderating impact of age is predicted in our study. In comparison to other age groups, customers aged 61 or above consider price as a significant factor influencing satisfaction ($p = 0.003$). It makes sense that the majority of people in this age are retired with limited incomes, which in turn lead to the price sensitivity of this group. Similarly, monthly income of patrons has a significant moderating impact. Due to lower incomes, groups with monthly income from £2,000 to £3,000 ($p = 0.001$) and from £3,000 to £4,000 ($p = 0.008$) consider price factor as significant in deciding their levels of satisfaction. Not unexpectedly, for the group with higher monthly income (above £4,000), price is not regarded as a significant factor ($p = 0.265$). Instead, they are more likely to be concerned with food quality of the restaurant offered ($p = 0.009$).

In summary, the results shown in Table VIII support our hypotheses on the moderating roles of gender, age, and monthly income.

5. Discussion, managerial implications and conclusions
Results of our multiple-regression analysis in Table VII have shown that food factor is viewed as the most important determinant of customer satisfaction, followed by in

Variable[a]	n	Food factor	Service factor	Ambience factor	Price factor	R^2	Adjusted R^2	F
Gender								
Male	92	0.257*	0.260**	−0.258**	0.242**	0.296	0.264	9.149**
Female	112	0.281**	0.285*	0.004	0.433**	0.197	0.167	6.582**
Age								
21-30	51	0.103**	0.128**	0.129	0.136	0.416	0.365	8.193**
31-40	59	0.148	0.326	−0.047	0.229	0.131	0.066	2.032
41-50	43	0.344	0.054	−0.146	0.252	0.189	0.104	2.220
61 or above	29	0.179	0.100	−0.092	0.726**	0.386	0.284	3.780*
Monthly income								
£2,000-£3,000	62	0.004	0.276	−0.005	0.415**	0.183	0.147	3.186*
£3,000-£4,000	48	0.481**	0.426**	−0.203	0.460**	0.471	0.424	9.581**
£4,000 and above	59	0.347**	−0.098	−0.151	0.162	0.256	0.246	4.644**

Table VIII.
Regression results of multi-group analysis

Notes: [a]Dependent variable: overall satisfaction. *,**Correlation significant at 0.05 and 0.01 level (two-tailed), respectively

order, price factor, ambience factor, service factor in the restaurant. Among them, food, price and service factor present significant and positive relationship with customer satisfaction. Ambience factor represents the vital, however, negative correlation with customer satisfaction. We have also found, from the results of Table VIII, that gender, age and monthly income of patrons significantly moderate the relationship between the four factors (food, service, ambience and service) and overall satisfaction.

5.1 Effects of the four factors on customer satisfaction on service quality
Our results show that food quality has a very high influence on customers' perception of overall satisfaction from restaurants. Food, as an essential component of dining experience, presents positive and the closest relationship with customer satisfaction. This opinion is supported by a number of previous studies (Law *et al.*, 2004; Chow *et al.*, 2007). It is no doubt that food has, and would continue to have the paramount effect on customer satisfaction. Taking into consideration the demands of more food-savvy and experienced patrons, restaurants should not only provide tasty with appealing presentation food that outperform competitors, but offer also safe and healthy food in order to response to customers' health requirements.

In contrast, service factor is found to have a significant influence on customer satisfaction, though the level of significance is lower compared to that of the other three factors. This conclusion is somewhat supported by an investigation undertaken by Johns and Howard (1998). They investigated expectations and perceptions of 100 customers on service quality in two pizza restaurants and concluded that service encounter is viewed as a not significant element compared with food, drink, environment and atmosphere. It might be considered as a unique feature in fast-food restaurant industry, in which interaction between customer and server is less than full-service restaurants.

Surprisingly, this study has found that ambience factor negatively affects customer satisfaction. This result may be explained from a psychology perspective. According to Tse *et al.* (2002), when consumers perceive a restaurant has very crowded environment, they would attribute this high level of crowdedness to high food quality, good reputation and low price which motivate people to visit the restaurant. On the contrary, if the restaurants environment is so quiet, the consumer would link the quietness with low food quality, poor reputation and high price. It seems to be a dilemma for restaurateurs. In this sense, how to balance the layout arrangement and the level of crowdedness is a challenge that must be faced by restaurant operators.

For a majority of patrons, the comparatively inexpensive food options of the restaurant have provided an incentive towards their satisfaction. This result is generally supported in the literature. Even some studies that found price to be insignificant did not argue against this factor. For example, although Qin and Prybutok (2009) and Pollack (2008) have concluded that price is not a significant indicator of customer satisfaction in their empirical research, they have believed that price maybe relatively homogenous among the restaurants in their studies thus exhibiting insignificant variation relative to the other factors.

5.2 Moderating influence of customer characteristics
Using regression analysis, this study has found that all the three moderating variables (namely, age, gender and monthly income) had a significant moderating role on the relationships between service quality factors and overall satisfaction. By doing so, it echoes some findings of previous studies (e.g. Chow *et al.*, 2007) but negates findings of Soriano (2002). Male customers expected better service quality for the price they pay.

This result is in line with the findings of Chow *et al.* (2007). People in the age of 21-30 provide higher importance for food and service factors. Older people have provided higher importance for the price attribute. These findings reflect the priority of each category of customers specifically on four factors, which can help managers to change their approach to improve overall satisfaction.

These findings have interesting implications for the managers of buffet restaurants. First, managers should spend efforts to improve all the four factors as all of them significantly influence satisfaction levels of customers. Price factor is important to both male and female customers. It is important for older customers (above 61 years of age) and to people in lower income groups (£2,000-3,000 and £3,000-£4,000). Hence, the perception of charging reasonable price is crucial. Younger people (21-30 years) and higher income customers (£3,000 and above) give high importance to food. Service is important for younger customers and customers with middle income levels. The relatively lower importance of service may be because the study is done in a buffet restaurant rather than a full-service restaurant. Overall, food and price seem to be important across more number of demographic characteristics, while ambience and service are important across fewer numbers of demographic characteristics. Managers should be provide facilities that reflects this relative importance.

5.3 Conclusions

Service sector failures are partly due to the lack of strategic orientation in measuring overall service quality and focusing on customer satisfaction. Identifying critical attributes and associated factors among diverse candidates are essential for maximizing customer satisfaction in sector sectors such as restaurants, hotels and hospitals. The results of this study can be useful to prioritize factors and determine which aspects should be most addressed in restaurants. This could help managers allocate their limited resources effectively and help achieve customer satisfaction in the most economical way.

This study concludes that all the four factors (food, service, ambience and price) are significant determinants of customer satisfaction. All except the ambience factor have positive impacts. Gender, age and monthly income of respondents have significant moderating impacts on these relationships. This research can be taken as a basis for identifying important factors of service quality to satisfy customers in the light of developing service operations quality to sustain ever growing competition. Our research approach can be extended for other service sectors such as hospitals and educational institutions.

The results of this study are not without limitations. One main limitation is that the data were collected in only one restaurant. More comprehensive analysis is possible when similar data are collected for multiple restaurants. Another limitation is that this study did not consider brand element and environment factors in customer satisfaction. It did not consider a particular brand and chain of restaurants but focused on a family owned, single shop restaurant. Future research is needed to examine whether brand attribute plays an important role in affecting customer satisfaction.

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