



The influence of eating location on the acceptability of identically prepared foods

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Received 3 September 2000; received in revised form 20 April 2002; accepted 14 October 2002

Abstract

Three different classes of variables, namely the food, individual and situation, contribute to the appreciation of food. A dish, Chicken à la King and Rice, prepared from identical ingredients and to a standard recipe, was served to consumers in a variety of settings ranging from a residential home for the elderly to a 4-star restaurant. Local custom and procedures for the service and consumption of the dish were observed and diners asked to rate its acceptability. Results show that location contributed significantly ($P < 0.009$) to overall acceptability. A hierarchy of locations emerge with upscale restaurants receiving higher scores than institutional settings. Gender did not appear to contribute to the variance although, in general, younger people tended to give lower ratings.

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Keywords: Situation; Food acceptance; Eating location; Context

1. Introduction

Three different classes of variables contribute to the appreciation of food; those variables related to the food itself, those related to the individual, and those related to the eating location and situation. Probably the most well known variables are those related to the food, since these are part of product development, and are supported by the technologies related to food science and technology. Next well known are the variables related to the individual, drawing from many fields including psychology and physiology. Least well known are the variables related to the eating situation.

The notion of 'situational variables' and their influence on food acceptance and consumption is not new. References appear as early as 1945 when acceptability ratings for both individual and categories of food were shown to vary when consumed in different locations. When consumed on the ground and on an aircraft flight, food was regarded much more critically in the air

and minor alterations to appearance, colour and taste had a considerable effect on acceptability (Green & Butts, 1945). This was further illustrated in research undertaken on snack items and meat products such as hot dogs and hamburgers, the latter being served in a variety of situations. Here the situational main effects and interactions provided nearly half of the explained variances in preference (Belk, 1974).

Since then studies have been undertaken to investigate specific variables. Milliman (1986), for example, looked at the effects of playing fast and slow music in a restaurant and North, Hargreaves, and McKendrick (1999), the effects of music on the sale of wine. More recently eating situations or contexts have been receiving increased attention, and a number of variables have been identified relating to the physical aspects of eating locations, the social aspects of eating, and the economic aspects of eating. These have been summarised and discussed in several recent reviews (Bell & Meiselman, 1995; Meiselman, 1996; Rozin & Tuorila, 1993).

Another approach to examining the role of eating location has been to serve identical food in different locations, and measure the difference in appreciation. This has been successfully done in both the United

Kingdom and the United States. The results show that appreciation of institutional food is lower than that of non-institutional food (Meiselman, Johnson, Reeve, & Crouch, 2000). This effect has been attributed to, at least in part, the role of customer's expectations. In other words, when customers are served identical food in different locations, the customers' existing expectations lead them to rate the food in a non-institutional setting higher than the food in an institutional setting. This stereotyping is well known in many products which consumers judge (Fox, 1992; Cardello, Bell, & Kramer, 1996).

The purpose of the current study was to extend the range of locations studied and examine the influence of diner demographics. The goal was to determine whether the institutional/non-institutional differences hold when a greater number and range of locations are studied. Another goal was to try to separate the person effect from the location effect. In general, locations are associated with a particular group or groups, and studies to date have been unable to separate the confounding variables of people and location. The present study sought to separate those effects by serving the same groups in different environments.

2. Methods

Ten locations, representing different types of food service situations, were used for this study. In every location, an identical dish (Chicken à la King and Rice) was produced centrally, distributed and served to the customers, and measurements taken.

2.1. Food preparation

The dishes chosen for this study were Chicken à la King and Rice which in the United Kingdom traditionally form a complete meal. Standard product sources, recipes and methods were used for the production of food. The chicken mixture, once cooked, was placed into cryovac bags, a vacuum drawn, blast chilled (method *sous vide*) and stored at 1–3 °C until required for service. Guidelines from the Department of Health (1989) were adhered to throughout food preparation and regeneration.

For service, the chicken was regenerated at the point of consumption using local equipment. The rice, "Uncle Bens", was plunged into boiling water for approximately 15 min until cooked, and then drained. Portion sizes were determined by local staff to reflect custom and practice. Where a self-service was in operation, customers determined their own portion size although portion size for the freshman's buffet was established by reference to similar outlets and standard data (Crawley, 1990).

2.2. Questionnaire

The questionnaire, developed from previous studies, was a single sheet pencil and paper instrument. Brief demographic details were requested and Appearance, Taste and Overall Acceptability were measured using a nine-point hedonic scale anchored with "Like Extremely" and "Dislike Extremely" at either end, with a neutral point of "Neither Like nor Dislike". Texture was measured using a similar scale, "Extremely Tender" at one end, "Neither Tender nor Tough" as the neutral point and "Extremely Tough" at the other end. Ratings for how full subjects felt were measured using a six-point scale with "Extremely Full" at one end and "Not Full" at the other.

2.3. The situations (locations)

In each situation, similar procedures were followed in that the study was monitored and controlled by the same senior researcher throughout. Local custom and procedures were adopted at each location and no attempt was made to influence the type and style of service. However, the reheating of the chicken and cooking of the rice were monitored to ensure not only that the regenerated products were reheated in a similar way but also to ensure that the correct temperatures had been reached.

Where subjects who were asked to complete the questionnaire were sitting at a table with others, all of those at the table were invited to complete a questionnaire although those data were not included in the study. At no time were subjects told the true nature of the study but if they did ask, they were simply told that it was "part of some university research" with no further explanation given. A summary of the situations (locations) is given in Table 1.

2.4. Subjects

The numbers of subjects for each location, their demographics, including gender, age, and whether they smoked are shown in Tables 2 and 3.

2.5. Data analysis

The acceptance scores in the ten different locations were analysed using an analysis of variance. Post-hoc testing was conducted with the Duncan's range test because of the unequal sample sizes.

While the data permitted us to examine the effect of demographics on these ratings, not all demographic subgroups are represented at each location. For example, the Residential home and Day care centre contained more women than men, and almost all of the participants were over 65 years. Gender was, therefore,

Table 1
Summary of situations (locations) where dishes were served

Situation (location)	Style of service	Style of dining	Choice of entrée	'Free'	Cash at point of sale
Army training camp	Self	Cafeteria	Yes	No	No
University staff refectory	Self	Cafeteria	Yes	No	Yes
Private boarding school	Self	Cafeteria	Yes	No	No
Freshman's buffet	Self	Dining room	No ^a	Yes	No
Private party	Self	Hall	No ^a	No	No
Residential home (elderly)	Table	Dining room	Yes	Yes	No
Student refectory	Self	Cafeteria	Yes	No	Yes
Day care centre (elderly)	Table	Dining room	Yes	No	Yes
University 4-star restaurant	Table	Dining room	Yes	No	Yes
Hotel 4-star restaurant	Self	Dining room	Yes	No	No

^a Vegetarian option available on request.

examined with analysis of variance for each food attribute, using main effects of location and gender, and the interaction of the two main effects. Age presented a similar if not more complicated variable, because not all ages are represented at each location. Some locations contain subjects representing only one or two age brackets and as can be seen from Table 3, young people tend to populate the Freshman's buffet, the Student refectory, the Army training camp, and the Private boarding school. Older people, not surprisingly, tend to populate the Residential home and the Day care centre while a range of people use the university 4-star restaurant, the Staff refectory, the 4-star restaurant, and the Private party. Thus, the initial analyses of variance, which examined age only, contained the main effect of age, and did not contain the main effect of location as well as the interaction of age × location.

Further analyses of overall acceptability included gender, age group (<25, 26–65, and 65+ years), smoking (smokers vs. non-smokers) and two different groupings of the situation/location variable. The first analysis of situation/location groupings categorized each of the locations as either cafeteria/self service, older people/institutional table service or restaurant table service.

Table 2
Subject and demographic details (gender and smoking)

Location/situation	n	Gender ^a (%)		Smoke ^a (%)	
		Male	Female	Yes	No
Army training camp	44	93.2	4.5	38.6	61.4
University staff refectory	38	71.1	28.9	5.3	94.7
Private boarding school	88	62.5	37.5	15.9	79.5
Freshman's buffet	83	39.8	60.2	41.0	59.0
Private party	78	33.3	65.4	7.7	92.3
Residential home (elderly)	43	37.2	62.8	2.3	93.0
Student refectory	33	51.5	48.5	18.2	81.8
Day care centre (elderly)	33	33.3	63.6	9.1	75.8
University 4-star restaurant	19	21.1	78.9	10.5	89.5
Hotel 4-star restaurant	32	37.5	56.3	21.9	68.8

^a Percentages may not total 100% due to missing data.

The second analysis categorized each of the locations as either a location where "cash" exchanged hands for the meal or as a location where it did not. To extend the analysis still further, an analysis of variance was undertaken on the total sample for gender; smoking vs non-smoking; and age, grouped 13–17, 18–25, 26–35, 36–45, 46–65, 65+ years.

3. Results

The analysis of variance conducted on the acceptance rating scores in the ten different locations, yielded a highly significant main effect of location ($F=2.496$, $df\ 9/477$, $P<0.009$). This indicates that location contributed significantly to the variation among the acceptance scores, and permits us to conduct post-hoc testing to determine which locations differ from each other.

Results (Table 4) show a 'hierarchy' of locations along a continuum that was significantly different at each end but not significantly different in the middle. The lower end of the continuum included the Army training camp, the University staff refectory, the Private boarding school, and the Freshman's buffet. The upper end of the continuum included the two restaurants, the University training restaurant, and the 4-star restaurant whilst the middle included the Private party, the Residential home, the Student refectory, and the Day care centre. Thus, the two restaurants were rated differently than the institutional settings, and the institutional settings appeared to divide with the lowest rating group containing more institutional locations with young participants, except for the student refectory.

The results of the Duncan test on the ratings of appearance, taste and texture follow similar patterns with the restaurants rating higher, and the institutions rating lower, especially the institutions catering to young people. For appearance, ratings from the Private boarding school were the lowest (5.8), and ratings from the University training restaurant (7.6), the 4-star

Table 3
Subject and demographic details (age)

Location/situation	n	Age ^a (%)					
		13–17	18–25	26–35	36–45	46–65	65+
Army training camp	44		95.5	2.3			
University staff refectory	38		7.9	26.3	31.6	34.2	
Private boarding school	88	40.9	46.6	3.4	2.3	1.1	
Freshman's buffet	83		96.4	2.4			
Private party	78		1.3	11.5	34.6	39.7	12.8
Residential home (elderly)	43						100.0
Student refectory	33		60.6	33.3	6.1		
Day care centre (elderly)	33			3.0	3.0	12.1	78.8
University 4-star restaurant	19		5.3	10.5	21.1	31.6	31.6
Hotel 4-star restaurant	32		25.0	25.0	21.9	25.0	

^a Percentages may not total 100% due to missing data.

restaurant (7.3) and the Day care centre (7.3) were the highest, with the remaining locations in the middle. For taste, the 4-star restaurant (7.6) and the University training restaurant (7.5) rated the highest, and the Freshman's buffet (6.5) the lowest. Three groups fell in the middle. And for texture, the Private boarding school (6.3) and the Army training camp (6.5) were the lowest, and the University training restaurant (8.0), the Private party (7.9), and the 4-star restaurant (7.8) rated the highest. The filling rating of the meal rated highest in the elderly residential home (4.7), next highest in the two restaurants, and least filling in the private boarding school, and next to least filling in the army camp.

Where gender was examined with analysis of variance for each food attribute, using main effects of location and gender, and the interaction of the two main effects, the main effect of location was significant ($P < 0.05$) as we have already seen above, but the effect of gender was not ($P > 0.3$). Furthermore, the interaction of location \times gender was not significant ($P > 0.29$). Therefore, gender does not appear to contribute to the variance of the ratings.

All of the analyses of variance for the effect of age on ratings were significant, for appearance ($F = 7.91$, $df 5/$

472, $P < 0.001$), taste ($F = 3.43$, $df 5/475$, $P < 0.005$), texture ($F = 16.88$, $df 5/473$, $P < 0.001$), and overall acceptability ($F = 2.28$, $df 5/472$, $P < 0.05$), but not for how filling the meal was ($F = 2.07$, $df 5/440$, $P > 0.06$). The Duncan tests comparing the ages showed that in general ratings increased with age except at the high end, where the highest ratings were given by the age group 46–65 years, with the next highest ratings given by the oldest age group 65+ years (Table 5). This pattern held for appearance, texture, overall acceptability, whereas for ratings of taste ratings increased with age group from 13–18 to 65+ years.

In the analysis of situation/location grouped as cafeteria/self service, older people/institutional, table service or restaurant table service, and where "cash" exchanged hands for the meal, the only significant effect, main effect or interaction was an interaction ($F = 3.4$, $P < 0.05$) between smoking and the first situation/location grouping. It is difficult to draw any meaningful conclusions from this interaction because of the small cell sizes, an inherent problem in this type of situation/location study.

Notwithstanding, the analysis of variance of the total sample for gender, smoking and age showed no significant effects for both gender and smoking but a significant difference between the age groups 13–17 and 46–65 years only.

Table 4
Ratings of overall acceptability

Location/situation	Mean	n ^a
Army training camp	6.6a	43
University staff refectory	6.6a	36
Private boarding school	6.7a	88
Freshman's buffet	6.7a	83
Private party	7.0ab	77
Residential home (elderly)	7.1ab	43
Student refectory	7.1ab	33
Day care centre (elderly)	7.1ab	33
University 4-star restaurant	7.6b	19
Hotel 4-star restaurant	7.6b	32

Means (with different letters) are significantly different ($P = < 0.05$).

^a Four subjects did not rate overall acceptability.

Table 5
Ratings of overall acceptability by age group

Age group	Mean	n ^a
13–18	6.6a	36
18–25	6.8a	195
26–35	6.8ab	47
36–45	7.0ab	53
65+	7.1ab	85
46–65	7.3b	62

Means with different letters are significantly different ($P = < 0.05$).

^a Four subjects did not rate overall acceptability and nine subjects did not respond to age group question.

4. Discussion

The main finding of the study is that location contributes significantly to food acceptance, both to the appreciation of particular food attributes, as well as to overall acceptability. This finding is in keeping with our past research (Meiselman, et al., 2000), but the present study goes well beyond anything published on contextual effects on food acceptance. The present study compared the acceptability of the same pre-prepared food item at ten different locations, ranging from an Army training camp, a Residential home for the elderly to 'white-tablecloth' restaurants. It could of course be argued that the results were confounded by any of the variables, such as age, acting either individually or collectively. However, virtually every analysis of the data showed significant differences across the eating locations.

Not only were there significant differences across eating locations, but these usually fell in the same order. Firstly, we observed a difference between institutional food outlets and non-institutional food outlets which we have observed in previous studies. However, in the present study, we were able to further delineate the 10 different locations. The institutional locations tended to break into two subsets, with the lower ratings going to the food product in those institutions that cater to younger populations (18–35) and the more moderate ratings going to those institutions that cater to an older group. The highest ratings went to the non-institutional restaurants that were used by a range of people but primarily middle-aged and older.

In addition, there were instances in which the same group was served in different settings. University students were observed during freshman week in a restaurant setting and in their usual refectory. Ratings of the same food in these two settings did not differ. The elderly were observed in a Residential home and in a Day care centre, and again these two locations did not differ. The University staff were observed in their staff refectory, were included in the University training restaurant, and were drawn from the same population as the 4-star restaurant; these three locations did differ. Thus, there is some evidence that different locations containing the same populations did show differences in food acceptance. Also, when people are observed out of their usual context, it is not clear what expectations and biases they bring to the new location. For example, the students being served in the training restaurant probably did not have the same experience as regular clients.

Further major findings in this study concerned demographics variables. In previous studies, we were unable to obtain demographic information and were therefore unable to test for differences in food acceptance across locations. Furthermore, in previous studies, our sample sizes did not always permit a breakdown of groups into sub-samples based on demographics even if we had the

demographic data. The present study did not show a gender effect, either by location or for the total sample, but did show an age effect between two age groups 13–17 and 46–65 for the total sample. Considering the gender comparison, the study was able to compare acceptance ratings of the same product for large and equal numbers of males ($n=240$) and females ($n=242$). Naturally, some locations had proportionately more males or more females, although only one location was practically devoid of one gender (Army camp, two females out of 43 people). Thus, this study represents the first indication that gender is possibly not a significant source of differences in food acceptance across different eating locations. This might be surprising given the existing folklore on the differences between males and females in food service situations (Edwards, 2000), and the gender differences in many food attitudes which have been reported. For example, in the first representative national sample of the food neophobia scale (Pliner & Hobden, 1992), it was demonstrated by Tuorila, Lahteenmaki, Pohjalainen, and Lotti (2001) that food neophobia among Finnish people is *lower* in women, in people with more education, and in younger people. The differences due to age and education in our sample could be quite large. Variety seeking tendency, which is the opposite of neophobia, is *higher* in women, in younger people, and in people with more education (van Trijp, 1995). However, Meiselman, Mastroianni, Buller, and Edwards (1999) found no gender differences in either food neophobia or variety seeking tendency in a longitudinal study. When eating out, Martens (1997) showed that although gender appeared to structure the eating experience, its influence was not strong as otherwise suggested and the gender differences for taste were described as 'slight'.

The study did show a significant effect of age. Ratings of overall acceptability indicated that the youngest age group rated food acceptability the lowest, with ratings increasing with age. The highest scoring group was the next to oldest age group (46–65 years), with the oldest age group (65+ years) giving the second highest scores. This same order held for ratings of appearance and texture, but not taste. Examination of the Duncan range test scores showed a cluster of the bottom two age groups on one end of the distribution, and the age group 46–65 at the top of the distribution, with the other age groups in between. The younger age groups include some but not all of the lowest scoring locations, the Army camp, the private boarding school and the freshman buffet. However, the university staff refectory also scored in the lowest group, but represented a middle-aged group. Conversely, the student refectory was comprised of younger people, but also did not score in the lowest group. Both elderly groups, the elderly residential home and the elderly day care centre, fell into the middle scoring part of the distribution. The Private

party which also fell into the middle part of the acceptance distribution, had a broad age representation but mainly middle-aged people. The two restaurants, the university training restaurant and the 4-star restaurant, had customers from a range of ages, but no elderly over 65 years.

Thus, age appears to contribute to how well food is rated, but this does not seem to result simply from the fact that different aged people are found in different locations. In general, younger people tend to rate food the lowest, but that is perhaps because they occupy many of the institutional facilities in our society, including schools, the army, and universities. In addition, middle-aged people appear to rate food the highest, but they occupy many of the facilities which provide better food and better service, and they are used to receiving that.

The age question is tricky because people of the same age occupy some of the same locations (as in a private party) and some exclusive locations (elderly facilities, young peoples' schools). The attitudinal research noted above also found age differences, with younger people being less neophobic and more variety seeking. We will need different research paradigms to separate these age effects encountered in different locations.

It has been shown that acceptability ratings for the expectation of institutional food are lower than those for non-institutional settings (Cardello, et al., 1996). In this research, a general rank ordering emerged with home being ranked > traditional full service restaurant > diner/fast food > school foodservice > military foodservice > airline foodservice ≈ hospital foodservice. When food is actually served and consumed, a similar pattern emerged and the food labeled as being 'institutional' received lower acceptability ratings for both expectancy and actual consumption (Cardello et al., 1996). Similar results have been found in other similar studies; for example, Meiselman et al., (2000) showed that the overall acceptability of food served in a grill-room was 0.9 higher than for similar food served in a University refectory. These results also hold good for the present study where four of the institutional settings are significantly lower from the two non-institutional settings. In the two locations where similar groups were served, i.e. the Freshman's buffet and the Student refectory, no significant differences were found.

It is important to note that the differences observed among locations were large, especially considering the large sample sizes at many locations, and the difference in overall acceptability was one full scale point on the nine-point hedonic scale. Ratings for taste also showed a one point spread between highest and lowest locations, while ratings for appearance, and texture showed even larger spreads. Location effects, therefore, can

have significant impact on the appreciation of food by consumers.

In this study we observed that the dispersion of the data varied by location as well as the acceptance scores themselves. Institutional locations tended to yield higher variability than less institutional, more upscale locations. This enhanced homogeneity of ratings could be an important factor in contextual differences and deserves further study.

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