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# Contributors to Dining Satisfaction of Residence Hall Students

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**Abstract**

Early writings on university housing show a connection between dining services and university residence halls (Riker & Lopez, 1 96 1 ) Regardless of how housing and dining programs are organized within the institution, the two entities are inevitably connected; living and eating go together. A recent annual study (Educational Benchmarking, Inc. (EBI), 2002) comparing four years of data cited satisfaction with dining as being one of the foremost predictors of overall residence satisfaction. This prominent relationship provides incentive for housing administrators to be more aware of students' dining satisfaction. The purpose of this research was to examine contributors to residence hall students' dining satisfaction at a large Midwestern university.

**Disciplines**

Family, Life Course, and Society | Higher Education | Home Economics | Models and Methods | Political Science

# Contributors to Dining Satisfaction of Residence Hall Students

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## INTRODUCTION

Early writings on university housing show a connection between dining services and university residence halls (Riker & Lopez, 1 96 1 ) .Regardless of how housing and dining programs are organized within the institution, the two entities are inevitably connected; living and eating go together. A recent annual study (Educational Benchmarking, Inc. (EBI), 2002) comparing four years of data cited satisfaction with dining as being one of the foremost predictors of overall residence satisfaction. This prominent relationship provides incentive for housing administrators to be more aware of students' dining satisfaction. The purpose of this research was to examine contributors to residence hall students' dining satisfaction at a large Midwestern university.

## Dining Services Satisfaction

According to the Association of College and University Housing Officers-International (ACUHO-I), when university food and housing operations are coordinated successfully, such a system can aid in "the programmatic and educational mission of the campus" (ACUHO-I ,2001 ). Campbell (1 993) noted that college and university food programs must move from simply serving meals to becoming an integral part of the students' campus and residence life experience. Astin's (1 999) research found the student's residence is "probably the most important and pervasive" environmental influence on the student's persistence in higher education. For students living in residence halls, dining services Usually constitute a part of the living environment.

Campbell (1 993) also declared that dining administrators must become more responsive and service-oriented toward their customers. Policies resulting from a service orientation will create a better dining program, which likely will attract more students to on-campus housing. Conversely, students who are dissatisfied with their dining service are likely to move off campus and then share their unpleasant views and experiences with many others (Kellogg, 1 999).

Koc ( 1 999) noted that understanding what students want in their dining options will allow campus dining services to make students more satisfied and SUCCeSSfUl in the university setting. One only has to visit institutional web sites (e.g., Austin Peay State University, Florida State University, Pepperdine University, University of Michigan) to discover that many universities currently conduct satisfaction surveys or ask for student comments in an attempt to gain insight about contemporary, and changing, student preferences for campus dining. Furthermore, Campbell (1 993) correctly predicted a variety of changes that have been implemented in dining programs to entice students to continue using residence hall dining services. Dining debit cards, flexible meal plans, branded fast food franchises, and many variations in dining environments have grown in popularity over the last decade in an effort to cater to students' wishes.

These actions indicate that university dining operators commit themselves to providing the best service possible to college students. Students want variety and convenience in all areas of their lives, and campus dining is no exception (Watkins, 2001 ). Unfortunately, the results of such surveys

rarely have been published beyond the individual institution. Formal research should be conducted to determine which process and structure best meet the needs of modern university students regarding the dining services provided to them.

In general, nutrition does not weigh heavily on students' minds when choosing what to eat (Rybczynski, Schreiber, Chakraborty, Panagopoulos, de Ryck, & Wehr, 2000). A recent Chronicle of Higher Education article (Ferrell, 2002) noted that many students talk about wanting nutritional foods, but soon gravitate to fast food and old eating habits. Although campus dining operators always should strive to present nutritionally sound meals, factors such as religion and ethnicity have been found to be important contributors to students' dietary decisions (Keston, 1 997; Richardson, Shepard, & Elliman, 1 994). Food service directors must keep this in mind in the future as campus populations continue to diversify. As Powers (1 990) concluded, ethnic groups seem to have different tastes in food. International students especially have trouble adiusting to food in the United States (Dillard & Chisolm, 1 983).

Although no studies could be found directly linking university dining service satisfaction with academic SUCCeSS, one nutrition study linked improved immediate recall and spatial memory resulting from eating breakfast (Benton, 1 992). Another study (Trockel, Barnes, & Egget, 2000) found that among nutrition-related variables examined, only eating breakfast showed a significant effect on GPA.

Previous research shows that many predictors of quality dining services exist. Adams (1 999) found that reliable predictors of student satisfaction with campus dining services are availability of choices, quality of food, and cost of dining services. The physical environment provided by dining facilities is also known to be an important predictor of student satisfaction with campus dining services. Early student housing literature described how best to build dining services (then called food services) to accommodate students and make the dining centers less impersonal and more pleasant. Attractive furnishings, pleasant décor, and better lighting and noise control also make for a more pleasant dining experience (Riker & Lopez, 1 961 ). Attention to these items will assist in keeping students satisfied with their residence hall dining program.

METHOD

## Population and Sample

Following approval by the university human subiects office and Institutional Review Board, a survey was administered in fall 2001 to a nonstratified simple random sample of students living in university undergraduate residence halls at a four-year Midwest public land grant university enrolling approximately 28,000 undergraduate and graduate students. Undergraduates comprise about 81 % of the student body. Thirty-two percent of undergraduates (over 7,000 students) live in university residence halls.

Undergraduates living in the residence halls are similar demographically to the overall university undergraduate population in all important respects except student classification. The residence halls contain a substantially larger proportion of freshmen (66%) compared to overall undergraduate enrollment (28%). The undergraduate population is comprised of 55% men and has ethnic composition of 92.7% Caucasian, 2.6% African-American, 2.6% Asian/Pacific Islander, 1 .8% Hispanic, and 0.3% American Indian or Alaskan Native; 4.8% are international students.

Demographic data for the survey were obtained from the Department of Residence and the Office of the Registrar student information files. Data were coded using a numeric student identifier substituting for individual Social Security numbers. The respondent population was 51 % male. Freshmen comprised 68% of the respondents.

**TABLE 1**

Most respondents (64.4%) reported having had board plans in the residence halls (item Q2 in the questionnaire) for 1 or 2 semesters, 25% for 3 or 4 semesters, 7.3% for 5 or 6 semesters, and 3.3% for more than 6 semesters. Number of semesters with a meal plan does not necessarily correspond with student classification, although generally a student who entered the university during his or her first semester would be classified as a freshman after living in the residence halls for or 2 semesters, a sophomore after having lived there for 3 or 4 semesters, a iunior after 5 or 6 semesters, and a senior after more than 6 semesters.

Organizationally, the residence hall dining service is part of the Department of Residence and includes five separate dining facilities. Serving capacity for each dining center ranges from 700 to 1 ,400 students. Student use of each dining center was captured by card swipe upon their entry into the cafeteria over a period of one year. (The card swipe data were used in place of survey item Q 1 .) Five dining centers were used most, according to the respondents: Dining Center 1 , Dining Center 2, Dining Center 3, Dining Center 4, and Dining Center 5 (see Table 1 ). Weekly meal plan options included 20, 1 5 , 1 4, and 1 0 meal choices; the number of meals reported eaten in residence dining centers by responding students ranged from 1 to 236 meals ,from the beginning of the academic year in August 2001 , through the requested completion date for the survey, prior to the end of Thanksgiving break (see Table 1 ).

The 33-item, multiple-response choice survey included questions about satisfaction with the

## NONDEMOGRAPHIC VARIABLES AND SURVEY ITEMS EXCLUDED FROM THE ANALYSES.

Nondemographic variables Used in the analyses, but not factored:

Dining center most often frequented by students (from actual records rather than QI )?

| | |
|---|---|
| Dining center I | n = 428 |
| Dining center 2 | n = 346 |
| Dining center 3 | 220/0 |
| Dining center 4 | |
| Dining center 5 | |

Meal plan options chosen by respondents (from residence records)

| | |
|---|---|
| 20 meal/week plan | $n = 781$ |
| 1 5 meal/week plan | $n = 84$ |
| 1 4 meal/ week plan270/0 | $n = 383$ |
| 10 meal/week plan1 30/0 | $n = 185$ |
| 1 00 meal plan/ semester | $n = 5$ |

Total number of meals eaten (from residence records)

Ranged from to 236 meals for fall semester through the completion date for the survey.

Variables not used in the analyses:

The following variables were not used in the analyses because of scale differences, or because actual data were obtained and preferred over survey data.

Q 1 . Which dining center do you eat in most often?

02. Including this semester, how many semesters have you had a meal plan at ISU?

03. What are your preferred eating habits?

The following variables were not used in the analyses because the items were considered irrelevant to evaluating students' perceptions of food service, or did not apply to a large number of students:

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variety, amount, and quality of food groups and beverages, serving hours, condition and appearance of the dining center and facilities , and courteousness and helpfulness of staff during service. Additional questions solicited information about the dining center used most frequently, eating habits, and length of time with a meal plan. Most questions used a Likert-type response scale, with I = Very dissatisfied, 2 —— Somewhat dissatisfied, 3 = Neutral, 4 — _ Somewhat satisfied, 5 = Very satisfied, and 6 = Does not apply/ have not used. (Category 6 was treated as missing data). A separate sheet solicited comments on the students' likes and dislikes about dining services.

Residence hall staff distributed the survey to a random sample of 2, 1 29 students living in the residence halls. The survey and optical scan answer sheet were enclosed in an envelope to allow confidentiality of responses. The survey requested the students' university identification number to allow researchers to link student responses to demographic information obtained from student records. A cover letter explained the survey and reasons for requesting the identifier. Returned surveys were usable for purposes of this study if the student supplied the identification number and if responses to the survey items were complete apart from an occasional missing response. Using these criteria, 67% of the 2, 1 29 surveys distributed were usable for subsequent statistical analysis and i nterpretation.

## Hypotheses for the Research

Although information regarding student satisfaction with specific components of residence hall dining services is important, students' overall satisfaction with those dining services is the focus

TABLE

## 2

### ROTATED COMPONENT MATRIX FROM FACTOR ANALYSIS OF m ITEMS MEASURING STUDENT SATISFACTION WITH RESIDENCE HALL DINING SERVICES

|  | Item satisfaction | Factors | | | |
|---|---|---|---|---|---|
|  |  | Beverages and optional food choices | Regular food line choices | Serving environment | hours |
| 025 | Quality of items available on the breakfast bar | 0.724 | | | |
|  | Variety of items available on the breakfast bar | | | 0.009 | 0.234 |
|  | Variety of deli line choices | 0.685 | 0.246 | | |
| 026 | Quality of deli line choices | 0.661 | 0.320 | 0.307 | |
| 027 | Quality of bakery | 0.647 | | 0.299 | 0.149 |
| Q17 | Variety of bakery items | | 0.339 | | |
| Q31 | Quality of beverages | 0.582 | | 0.447 | 0.060 |
| 021 | Variety of beverages | 0.467 | | 0.453 | 0.061 |
| 019 | Variety of vegetables and fruits | 0.229 | 0.727 | 0.046 | |
| 029 | Quality of vegetables and fruits | 0.264 | 0.720 | 0.269 | |
| 030 | Quality of meat items | | 0.720 | 0.222 | 0.082 |
| 020 | Variety of meat items | | 0.704 | | |
|  | Quality of items available on the salad bar | 0.389 | 0.627 | 0.306 | 0.091 |
| 028 | Variety of items available on the salad bar | 0.450 | 0.587 | | |
| 018 | Amount of food that you get for your money | | 0.365 | 0.296 | 0.092 |
|  | Courteousness and helpfulness of dining center student employees | | | 0.808 | |
|  | Courteousness and helpfulness of the dining center staff | | 0.224 | 0.754 | |
|  | Cleanliness of the dining centers and serving areas | 0.228 | 0.295 | 0.504 | 0.230 |
| 07 | Serving hours for dinner | 0.062 | 0.260 | | 0.727 |
| Q6 | Serving hours for lunch | 0.269 | | 0.204 | 0.722 |
| QA | Serving hours for breakfast | | 0.081 | 0.082 | 0.647 |

Extraction Method: Principal Components Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 6 iterations.

of this research. This study attempts to ascertain which student demographic characteristics and perceptions measured by the survey best predict overall satisfaction with the residence dining program. Based on existing literature and available data, it was hypothesized that the best predictors of students' overall satisfaction with dining services would be: (a) gender, ethnicity, classification, and citizenship; (b) satisfaction with specific beverages and optional food choices, regular food line choices, and dining environment and meal hours; and (c) components of students' dining behavior. Factor analysis was employed to help address these questions, and the resulting derived factors were used in developing an ordinary least squares regression model.

## Factor Analysis and the Regression Model

A first major step in statistical analysis of the survey data was to identify the underlying factors, or latent constructs that explained interrelationships among the dining service survey items. Factor analysis (principal components extraction, followed by varimax rotation) was conducted on the survey questions that shared a common measurement scale. Table 1 lists items not included in the analyses. In addition , reliability analysis was undertaken to determine the strength and consistency of the correlations among the items that loaded strongly on each factor.

Table 2 presents the factor loadings resulting from this analysis and other relevant assigned labels, and their reliabilities (Cronbach's alpha values) were as follows:

## 3

### COEFFICIENTS FOR THE REGRESSION MODEL
### (DEPENDENT VARIABLE: OVERALL STUDENT SATISFACTION WITH DINING SERVICES)

| Predictors | Unstandardized Coefficients | Std. Error | Standardized Coefficients Beta | | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| (Constant) | | o. 160 | | 19.937 | 0.000 | 0.3071 |
| Factor 1 : Beverages and optional food choices | 0.280 | | 0.345 | | 0.000 | 0.2691 |
| Factor 2: Regular food line choices | 0.476 | 0.015 | 0.583 | 30.824 | 0.000 | 0.5144 |
| Factor 3: Dining environment | 0.356 | 0.015 | 0.436 | 23.291 | 0.000 | 0.3769 |
| Factor 4: Serving hours | | 0.015 | | | 0.000 | O. 060 |
| Ethnicity: Maiority | | 0.056 | 0.052 | 2.649 | 0.008 | 0.0078 |
| Gender: Male | -0.006 | 0.034 | -0.003 | | 0.867 | 0.0000 |
| Citizenship: U.S citizen | 0.060 | | 0.009 | 0.450 | 0.653 | 0.0002 |
| Classification: Freshman | | 0.081 | 0.059 | | 0.206 | 0.0018 |
| Classification: Sophomore | 0.069 | 0.085 | 0.035 | 0.809 | . | 0.0007 |
| Classification: Junior | -0.059 | 0.096 | -0.019 | | 0.540 | 0.0004 |
| Total number of meals eaten | -0.001 | 0.000 | -0.037 | -l .664 | 0.097 | 0.0031 |
| Meal plan | 0.025 | 0.016 | 0.034 | . | 0.130 | 0.0026 |
| Dining center used most often: Dining center 2 | 0.041 | 0.047 | 0.021 | 0.877 | 0.381 | 0.0009 |
| Dining center Used most often: Dining center 4 | -0.004 | 0.053 | -0.002 | -0.068 | . | 0.0000 |
| Dining center Used most often: Dining center 5 | o. 100 | 0.060 | 0.037 | | 0.095 | 0.0031 |
| Dining center used most often: Diiiiig cerriei 1 | v.viv | v.v iv | .vvv | v.l .vv | v.i v. | v.vvv. |

*Note.* $R^2 = .694$, adjusted $R^2 = .688$; $F = 126.912$ (16, 897), $p < .001$.

| Dining center | 0.045 | 0.006 | | | 0.827 | 0.0001 |

information about the variables. The factor loadings have been sorted so that variables with high loadings on the same factor appear together. Four factors were obtained from these 2 1 survey questions. The factors, their

Factor 1 . Beverages and optional food choices had high loadings on: (a) Quality of items available on the breakfast bar (025); (b) Variety of items available on the breakfast bar (QI 5); (c) Variety of deli line choices (QI 6); (d) Quality of deli line choices

(026); (e) Quality of bakery (027); (f) Variety of bakery items (QI 7); (g) Quality of beverages (03 1 ); and (h) Variety of beverages (021). (Reliability = .88).

Factor 2. Regular food line choices had high loadings on: (a) Variety of vegetables and fruits (QI 9); (b) Quality of vegetables and fruits (029); (c) Quality of meat items (030); (d) Variety of meat items (020); (e) Quality of salad bar items (028); (f) Variety of items available on the salad bar (QI 8); and (g) Amount of food that you get for your money (QI 4). (Reliability = .86). Factor 3. Dining environment had high loadings on: (a) Courteousness and helpfulness of dining center student employees (QI 2); (b) Courteousness and helpfulness of the dining center staff (QI l ); and (c) Cleanliness of the dining centers and serving areas (Q8). (Reliability = .73).

Factor 4. Serving hours had high loadings on: (a) Serving hours for dinner (G7); (b) Serving hours for lunch (Q6); and (c) Serving hours for breakfast (04). (Reliability = .59).

The reliabilities for each factor were fairly high, particularly for the first two factors. This indicates a strongly consistent pattern of correlations among the variables that appear within each factor. The mean of four survey questions (Q9—overall appearance and decor of the dining centers; QI O—overall condition of the dishes, glasses, and tableware; Q23—overall variety of the food; and Q33—overall quality of food) was used as the dependent variable, which was named overall satisfaction with dining services (Reliability = .76). Together with the four factors underlying perceptions of dining services, the predictors of overall satisfaction with dir-ung services also included student demographic variables (i.e., ethnicity, gender, citizenship, and classification) and student dining variables (i.e. ,total number of meals, meal plan selected, and dining center used most often). The method of ordinary least squares was used to estimate the regression model.

RESULTS

Results of the regression equation for the model are summarized in Table 3. All four of the satisfaction factors were significant predictors of overall satisfaction with dining service when controlling for the other predictor variables in the model: (a) the four factors underlying perceptions of dining services; (b) student demographic variables (ethnicity, gender, citizenship, and classification); and (c) student dining variables (total number of meals, meal plan selected, and dining center Used most often). The magnitudes of their partial eta squared values, shown in Table 3, indicate the relative contribution of each predictor to explaining patterns of variation in the dependent variable. Regular food line choices were the best predictor (Partial Eta Squared = .5 1 44), followed by dining environment, beverages and optional food choices, and serving hours. One demographic variable , ethnicity, was a statistically significant predictor of overall dining satisfaction, indicating that maiority students were more satisfied with dining service than were minority students.

Two other significant predictors were found, although their relationships with overall student satisfaction were not as strong as the above five. Total number of meals eaten was a significant negafive predictor; that is, students who ate more meals reported less overall satisfaction with dining services. However, most frequent eating in Dining Center 5 was a positive predictor of overall dining services satisfaction, perhaps because of the vegetarian options it provided.

The combined effect of all the predictor variables in the regression model was significant (F = 1 26.91 , 1 6, 897, .001 ). The $R^2$ value of .694 shows that the combined predictors in this model explained 69.4% of the variance in overall satisfaction with dining services. The fact that the adjusted $R^2$ value of .688 is very close to the unadjusted $R^2$ value (.694) 'indicates that valid interpretations of the model results may be undertaken with very little reason for concern that such interpretations potentially , be confounded by high intercorrelations among the predictor

variables (multicollinearity) or by misspecification of the model.

Written comments included a variety of both positive and negative responses. Written comments received from respondents were recorded on a separate page from the optical scan sheets on which the student identifier number was recorded, because room for comments was not provided, and therefore could be summarized only by residence hall house and by the mostfrequented dining center. There were no discernable differences from one dining center to another, and each dining center received about the same number of positive and negative comments. Positive comments reflected most students' awareness and appreciation of the difficulties that arise in serving many customers. Other comments showed appreciation for the convenience of being served and the accompanying freedom from cooking and cleaning UP. Desserts received very favorable ratings as well.

Negative comments included the cost of meals and meal plans offered; however, no questions addressed their satisfaction with meal cost. A high level of student concern likely is due to the closely similar pricing of all meal plan options. Other comments focused on variety and a more definitive meat item. It was clear that respondents often preferred a piece of meat rather than casseroles containing meat.

## DISCUSSION

The relative predictive strength of each of the predictor variables may be determined from Table 3 most directly by examining the effect size (Partial Eta Squared) values, which translate to the percentage of total variation in the dependent variable attributable to that part of the model. Although it was expected that satisfaction with some components of residence hall dining services would predict overall dining satisfaction ,it was somewhat surprising that all four factors derived from analysis of the survey data contributed strongly to explaining variation in student satisfaction. The factor of regular food line choices was the single strongest predictor of overall satisfaction, so attending to the quality and variety of those items at meals will influence students' satisfaction the most, taking into account the additional considerations represented by the other predictor variables. However, the influence of beverages and optional food choices, the dining environment, and even serving hours

cannot be ignored.

Students who eat most often at Dining Center 5 are significantly more satisfied with dining services. The fact that this is the sole designated vegetarian/ vegan dining center may reflect students' preferences for a wider array of food choices. In addition, the high level of satisfaction with Dining Center 5 may be because this dining center is more intimate, serving the smallest number of students.

It is rather surprising that a larger number of demographic variables were not significant predictors of dining satisfaction. There were no significant differences in gender, citizenship, or even classification. It might be that students who did not like residence hall dining services food often move into Greek or off-campus housing.

Majority students were more satisfied than nonmaiority students with residence hall dining service. This is not surprising, because majority students would be more accustomed to the foods commonly served locally, and hence most likely to be served in residence hall dining facilities than WOUld most minority or international students. Although the menu cycle is constructed to offer a variety of foods, the types of food served generally reflect the preferences of late adolescents and young adults within the geographical community of the state. Accordingly, there is less availability of food choices that may be more attractive to students who identify their heritage as African, Hispanic, Asian, or American Indian, for example.

There is a slight but statistically significant negative relationship between the number of meals eaten and students' overall satisfaction with dining services. One would surmise that this is due to students tiring of the routine associated with residence hall dining as much as to the nature and quality of the food served. Although there is an 8-week menu cycle, the nature and types of food begin to seem the same.

## CONCLUSIONS

The regression model indicates that independent variables are successful in predicting student satisfaction with dining services. The significant predictors provide a focus for dining managers to use in fostering changes and improvements. These results indicate that for this student population, the student classification, gender, or citizenship characteristics that normally might be thought of as contributing to overall satisfaction do not significantly influence student satisfaction with residence hall dining services. This information may affect how administrators search for answers to improving their dining operations.

Policy decisions regarding food choice should be proactive, involving students in focus groups and menu planning; such decisions also should consider recipe taste testing as a way to determine what food items students prefer. Management staff working in these facilities should focus their attention on food preferences related to differences in race and ethnicity. Extensive focus group study of, or systematic interviews with, minority students may assist in understanding how to make minority students more satisfied with dining services. Food service and student affairs administrators also should educate students regarding the right decisions to make in selecting among food choices and the role that choosing a variety of foods plays in their satisfaction.

Environment in most cases is a key element in dining satisfaction, and new venues may increase student satisfaction. One new dining concept, termed Marché, allows students to have their choice of food prepared in front of them while they wait and gives them several types of food options. This new concept also could help resolve current issues associated with the perceived low value of dining center food relative to its cost.

This survey has attempted to assess students' satisfaction with dining services at a large Midwestern university. Further research might address whether

these influences are consistent across various institutional types. If influences are not consistent for different kinds of institutions, determining the sources of any inconsistency would be extremely informative. Other future research could focus on ascertaining additional variables that might better explain students ,overall satisfaction with dining services.

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