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ABSTRACT

Three statistical techniques--conjoint analysis, a multiple linear regression model, and a multiple linear regression model with a surrogate person variable--were used to estimate the relative importance of five university attributes for students in the process of selecting a college. The five attributes include: availability and variety of financial aid, dorm life (living conditions and food quality), quality of education (quality of teaching, career relevance of the curriculum, and overall institutional reputation), student-faculty relationships and interaction (availability of faculty to students, faculty promotion of student development, and degree of faculty advice given to students on personal as well as academic matters), and campus social life. Comparison of the results of the three techniques showed that all three produced identical estimates of the relative importance of the five attributes, but the multiple linear regression model with a surrogate person variable produced the highest correlation between observed and predicted ratings for the hypothetical universities not included in the estimating procedures. The questionnaire is appended. Contains 16 references. (MSE)

CONJOINT ANALYSIS:
A STUDY OF THE EFFECTS OF USING PERSON VARIABLES

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Abstract

Three statistical techniques--conjoint analysis. a multiple linear regression model, and a multiple linear regression model with a surrogate person variable--were used to estimate the relative importance of five university attributes for students in the process of selecting an institution of higher education. The results of the techniques were compared. The use of the three procedures produced identical estimates of the relative importance of the five attributes. The multiple linear regression model with a surrogate person variable, however, produced the highest correlation between the observed and predicted ratings for the hypothetical universities not included in the estimating procedures.

Introduction

It is a common task for marketing researchers to attempt to measure the relative importance of various attributes of a product as viewed by consumers. Such information can provide the producer of the product with valuable information on how to market or change the product. During the decade. pressure on university budgets has sent administrators of institutions of higher education searching to find ways to better market their institutions.

Some university administrators are currently searching for research methods that will allow them to better gage what institutional characteristics influence their prospective students. A number of reasearch methods and statistical procedures could be used to assess the relative importance of various attributes of a university as viewed by its prospective students. One such technique is conjoint analysis (Green & Srinivasan, 1978; Green, Goldberg, & Montemayor, 1981; Green,

Carroll, & Goldberg, 1981; Leigh, Mackay, & Summers, 1984;) Another technique that may prove fruitful is the use of multiple linear regression models with person variables (McNeil, Kelly & McNeil, 1975; Pedhazur, 1977; Williams, 1977, 1980; Fraas & McDougall, 1983; Williams, J. D., & Williams J. A. 1985a, 1985b).

This particlular study compares the results of using conjoint analysis, a multiple linear regression model, and multiple linear regression model with a surrogate person variable to analyze the relative importance of university attributes as viewed by students.

Methodology

Research Instrument

The research instrument used to collect the data analyzed in this study focused on five institutional attributes purported to be of significance to students who matriculated to Ashland University. This list of attributes was developed through literature reviews (Tierney, 1980; Traynor, 1981; Kuh, Coomes, & Lindquist, 1984; Conant, Brow & Mokwa, 1985), discussion with program advisors and students, and from the past experiences of admissions recruiters.

The five attributes included in this study were financial aid, social life, quality of dorm life, student-faculty relationships, and quality of education. Brief descriptions of the attributes were provided on the survey instrument to ensure better understanding by the students of what each attribute entailed. Appendix A contains a copy of the survey instrument.

Each of the five attributes had two levels. The two levels that were formed for each attribute were assigned a value of 0 or 1 in order to allow the researchers to quantitatively form hypothetical universities with various combinations of attribute levels. The attributes, levels, and values assigned to each level were as follows:

1. Quality of education
    a) reputation is not well known = 0
    b) reputation is well known = 1
2. Student/Faculty relationships
    a) faculty are accessible if sought = 0
    b) faculty are extremely accessible = 1
3. Quality of dorm life
    a) below my expectations = 0
    b) above my expectations = 1
4. Financial aid
    a) little financial need is met = 0
    b) most financial need is met = 1
5. Social life
    a) few social activities are available = 0
    b) many social activities are available = 1

Five attributes with two levels each would allow 32 different university profiles to be formed. With the assumption that interaction effects are negligible, the main effects could be estimated with only eight orthogonal arrays. The eight

orthogonal arrays used in this study, which were formed with the aid of the computer software entiltled Conjoint Designer (Bretton-Clark. 1987), were listed in Table 1.

In addition to the eight orthogonal arrays, two arrays were designed to provide a means of assessing the degrees of predictive validity for the results obtained from the conjoint anaylsis, the multiple linear regression model, and the multiple linear regression model with a surrogate person variable (see Table 1). These two arrays were referred to as the "holdout universities" because they were not included in the three estimation procedures.

The students were asked to rate on a scale ranging from 1 to 10 each of the ten hypothetical universities represented by the arrays. A value of 1 indicated that the university was viewed unfavorably; and a rating of 10 meant that the university was very much preferred.

The questionnaire was administered during the second week of the fall term of 1987 to freshman students enrolled in the freshman seminar course. A total of 100 of the questionnaires was randomly selected for use in this study.

Conjoint Analysis

Analysis Procedure

The conjoint analysis of the data included in this study was done with the aid of the computer software Conjoint Analyzer (Bretton-Clark, 1987). The analysis conducted by this software

Table 1

Orthogonal Arrays
Used for Conjoint Analysis
and Multiple Linear Regression Models

Universities	Quality of Education	Student/Faculty Relationships	Quality of Dorm Life	Financial Aid	Social Life
A	0	0	0	0	0
B	1	0	0	1	1
C	1	1	1	1	0
D	0	1	1	0	1
E	0	1	0	1	0
F	1	1	0	0	1
G	1	0	1	0	0
H	0	0	1	1	1
Holdout Universities					
I	1	1	1	0	1
J	1	1	0	1	0

Each characteristic is composed of two levels. The zero value indicates the presence of the lower of the two levels.

produces a set of five regression coefficients plus a constant term for each student. That is, a separate regression analysis was performed on the data of each of the 100 students. The coefficients and constant term were estimated for each student's ratings by the ordinary least squares regression procedure.

Each of the regression coefficients generated by the conjoint analysis for a given student indicated what would happen to the respondent's ratings of the universities when the attribute changed from the "zero" level to the "one" level. To illustrate the point, consider the regression coefficient value of 2.0 recorded for the financial attribute for respondent 1. If financial aid was to increase from the "little need being met" category to the "most need being met" category, the respondent's ratings of the universities would increase by 2.0 points on the 1 to 10 scale used on the questionnaire.

In order to determine the impact of each of the five attributes on the student ratings for the total sample, an average value of the regression coefficient was calculated. Thus, the average regression coefficient value for each attribute was formed by averaging the 100 regression coefficients.

A relative importance figure was calculated for each attribute by dividing the sum of the five average regression coefficients into each of the average regression values. The five relative importance figures generated by this procedure were expressed as percentages.

Results of the Conjoint Analysis

The five average regression coefficients produced by the conjoint analysis, which were listed in Table 2, ranged from 1.775 for financial aid to 1.015 for social life. The relative importance figures indicated that financial aid was the most important attribute with a value of 26.24%. Financial aid was followed in importance by the quality of dorm life (21.29%), the quality of education (20.84%), the student/faculty relationships (16.63%), and the social life (15.00%).

Predictive Validity

To determine the degree of predictive validity of the conjoint analysis, the information obtained from the two ratings of the holdout universities provided by each respondent was used. A predicted rating for each of the two noldout universities was estimated using the regression weights obtained for each of the 100 respondents and the orthogonal arrays that represented the two hypothetical universities.

The observed and predicted ratings for the holdout universities were used to provide two estimates of the ability of the results of the conjoint analysis to predict student ratings. The first estimate was a correlation coefficient for the predicted and observed ratings. The second estimate was an average absolute difference value for the difference between the predicted and observed ratings. The correlation coefficient value and the average absolute difference for the observed and predicted ratings were .37 and 1.57, respectively.

Table 2

Conjoint Analysis Results

Characteristic	Average Regression Coefficient	% of Relative Importance
Financial Aid	1.775	26.24
Quality of Dorm Life	1.440	21.29
Quality of Education	1.410	20.84
Student/Faculty Relationships	1.125	16.63
Social Life	1.015	15.00

Correlation coefficient between the predicted and observed ratings of the holdout universities = .37

Average absolute difference between the predicted and observed ratings of the holdout universities = 1.87

Multiple Linear Regression Model

Model Structure

The student responses obtained from the survey forms were also analyzed with a multiple linear regression model. The variables included in the model were as follows:

Y = ratings of the eight hypothetical universities (values ranged from 1 to 10)

X1 = quality of education (0 = "low" level; 1 = "high" level)

X2 = student/faculty relationship (0 = "low" level; 1 = "high" level)

X3 = quality of dorm life (0 = "low" level; 1 = "high" level)

X4 = financial aid (0 = "low" level; 1 = "high" level)

X5 = social life (0 = "low" level; 1 = "high" level)

The regression model (Model 1) used to analyze the student ratings was as follows:

$$Y = aU + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + e \quad \text{(Model 1)}$$

The number of observations for Model 2 was 800, which was formed by multiplying the number of ratings supplied by each student (8) by number of students (100). Table 3 contains a partial listing of the data set as structured for analysis by Model 1. The denominator degrees of freedom for this model was 794. This value was calculated by subtracting the number of estimated parameters (6) from the number of observations (800).

Table 3

Data Structure Analyzed by
Multiple Linear Regression Model 1

Respondent	Variable Y	X_1	X_2	X_3	X_4	X_5
	2	0	0	0	0	0
	7	1	0	0	1	1
	10	1	1	1	1	0
Respondent #1	5	0	1	1	0	1
	3	0	1	0	1	0
	7	1	1	0	0	1
	6	1	0	1	0	0
	4	0	0	1	1	1
	4	0	0	0	0	0
	5	1	0	0	1	1
	7	1	1	1	1	0
Respondent #2	9	0	1	1	0	1
	1	0	1	0	1	0
	3	1	1	0	0	1
	3	1	0	1	0	0
	3	0	0	1	1	1
	.	.	.	.	.	.
	.	.	.	.	.	.
	.	.	.	.	.	.
Respondent #100	1	0	0	0	0	0
	5	1	0	0	1	1
	8	1	1	1	1	0
	5	0	1	1	0	1
	5	0	1	0	1	0
	6	1	1	0	0	1
	4	1	0	1	0	0
	7	0	0	1	1	1

It must be noted that Model 1 does not reflect the fact that the 800 observations were not obtained from 800 students, but rather the data consisted of 100 students who rated eight universities each. Thus, the Model 1 ignores important information. Due to this fact, the researchers do not recommend the use of this procedure for analyzing the type of data included in this study. The results of Model 1 were presented to demonstrate the similarities and the differences between the conjoint analysis and Model 1.

The regression coefficients produced by Model 1 were identical to the average regression coefficients generated by the conjoint analysis (see Table 4). Each of the five regression coefficients was statistically significant at the .05 level. The multiple correlation coefficient for Model 1 was .655; and the R^2 value for Model 1 was .43.

Predictive Validity

When reviewing the predictive ability of Model 1, it is very important to note that with the use of this model an individual set of regression coefficients was not generated for each respondent as was the case for the conjoint analysis. The degree of predictive validity of Model 1 was examined through the use of two basic procedures. In the first procedure the regression coefficients calculated for Model 1 were used to predict the ratings of the holdout universities. These predicted ratings were correlated with the actual ratings. The correlation coefficient and the average absolute difference values for the predicted and observed ratings were .13 and 1.60, respectively

Table 4

Multiple Linear Regression Results for Model 1

Variable	Regression Coefficients	T Value
X_1	1.410	11.26
X_2	1.125	8.98
X_3	1.440	11.50
X_4	1.775	14.17
X_5	1.015	8.11
Constant	1.620	

R^2 = .43

df_d = 794

The second procedure used to judge the degree of predictive validity of Model 1 was a double cross-validation procedure. In this procedure the sample of 100 students was divided in half. Each half of the data set was analyzed with Model 1. The regression coefficients produced by Model 1 for the first half of the data set were used to predict the ratings of the students in the second half of the data set. A correlation coefficient value was calculated for the observed and predicted scores. The correlation coefficient produced by this procedure was .68, which was only slightly less than the multiple correlation coefficient value of .70 for Model 1 when applied to the first half of the data set. Thus, the degree of shrinkage was less than 3%.

The same procedure was also followed for the second half of the data set. The correlation coefficient for the predicted and observed ratings was .61, which again was only slightly below the multiple correlation coefficient value of .64 produced by Model 1 when applied to the second half of the survey information. The degree of shrinkage was less than 5%.

Multiple Linear Regression Model With a Surrogate Person Variable

Model Structure

The third approach used to analyze the survey information required the construction of a multiple linear regression model that included a surrogate person variable. Before such a model is presented, however, a discussion of a model that includes the actual person variables may prove helpful. The variables

included in the model that used person variables (Model 2) were as follows:

Y = ratings of the eight hypothetical universities
(values ranged from 1 to 10)

X1 = quality of education
(0 = "low" level; 1 = "high" level)

X2 = student/faculty relationship
(0 = "low" level; 1 = "high" level)

X3 = quality of dorm life
(0 = "low" level; 1 = "high" level)

X4 = financial aid
(0 = "low" level; 1 = "high" level)

X5 = social life
(0 = "low" level; 1 = "high" level)

P1 = respondent 1
(1 if from respondent 1; 0 otherwise)

P2 = respondent 2
(1 if from respondent 2; 0 otherwise)

.
.
.

P99 = respondent 99
(1 if from respondent 99; 0 otherwise)

The structure of the regression model with person variables was:

$$Y = aU + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + b6P1 + b7P2 + \ldots + b104P99 + e \qquad \text{(Model 2)}$$

The use of the person variables required by Model 2 is not practical due to their large number. Thus, a multiple linear

regression model designed to include a surrogate person variable was used. This surrogate person variable measured the impact of the 99 person variables required by Model 1.[1]

The value of the surrogate person variable was composed of an average rating for each person. That is, the average of the eight ratings for each respondent was computed and the average rating was entered eight times for that respondent. To illustrate, consider the average rating of 5.5 given by respondent 1 for the eight hypothetical universities. The average value of 5.5 was recorded in the surrogate person variable eight times for respondent 1. The same procedure was followed for the other 99 respondents to determine the values to be included in the surrogate person variable.

The variables used to construct Model 3 were the same as those used in Model 2 except the person variables were replaced with the surrogate person variable. The surrogate variable was represented in Model 3 by "X6". The values for this variable ranged from 2.625 to 8.5 for the 100 students.

The multiple regression model with the surrogate person variable (Model 3) used to analyze the survey information was as follows:

$$Y = aU + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + b6X6 + e \quad \text{(Model 3)}$$

The number of observation for this model was 800 due to the fact

[1] Refer to Pedhazur (1977), Williams (1977 & 1980), Fraas and McDougall (1983), and Williams and Williams (1985a & 1985b) for discussions of a surrogate variable used to measure the amount of variation in the dependent variable associated with a set of person variables.

that each of the 100 respondents rated the eight hypothetical universities. The denominator degrees of freedom for this model was not, however, equal to 794, as was the case for Model 1. The values for degrees of freedom of the denominators of Models 2 and 3 were the same (df = 695). This number was calculated by subtracting from total number of observations (800) the number of university attributes (5), the number of respondents that the surrogate person variable represented (99), and the number of constant terms (1).

Results of the Multiple Regression Analysis

The results of the multiple linear regression model with the surrogate person variable were listed in Table 5. Once again the regression coefficients for the university attributes that were generated by Model 3 were equal to the regression coefficients for Model 1 and the average regression coefficients for the conjoint analysis. Each of the regression coefficients for the university attributes was statistically significant at the .01 level.[2] The multiple correlation coefficient was .764; and the R^2 value was .58. A comparison of the R^2 values of Models 1 and 3 reveal that the surrogate person variable accounted for 13% of the variation in the ratings over and above the percent of variation accounted for by the university attributes. The 13% variation accounted for by the person variable was statistically significant at the .01 level.

[2] Since the standard errors of the coefficients listed on the computer printout were calculated with the incorrect degrees of freedom, the t values had to be recalculated before they could be listed in Table 5.

Table 5

Multiple Linear Regression Results for Model 3

Variable	Regression Coefficients	T Value
X_1	1.410	12.21
X_2	1.125	9.74
X_3	1.440	12.47
X_4	1.775	15.37
X_5	1.015	8.79
X_6	1.000	
Constant	-3.38	

n_2 = 800
R^2 = .58

df_d = 695

Predictive Validity

The procedures used to establish the predictive validity of the multiple linear regression model without person variables (Model 1) were applied to Model 3. First, the regression coefficients generated by Model 3 were used to predict the ratings of the holdout universities. The correlation coefficient for the predicted and observed ratings was .76. The average absolute difference between the predicted and observed ratings was 1.50.

The double cross-validation procedure used to evaluate Model 1 was also applied to Model 3. That is, the data set was divided in half; and Model 3 was used to analyze the first half of the original 100 observations. The regression weights produced by this analysis were used to predict the ratings for the second half of the data. The predicted and observed ratings for the students in the second half of the data set were correlated. The correlation value was .76, which was only slightly below the multiple correlation coefficient value of .775 for Model 3 when applied to the first half of the data. The degree of shrinkage was less than 2%.

The same procedure applied to the second half of the data set resulted in a correlation coefficient value of .74 between the observed and predicted ratings. Again, this value shows little shrinkage (1.7%) from the multiple correlation coefficient of .753 for Model 3.

Comparison of the Results

The estimated impact of the university attributes on the student ratings by the conjoint analysis, the multiple linear regression model without person variables, and the multiple linear regression model with a surrogate person variable were identical. For all three procedures the order of importance was as follows: 1) financial aid, 2) quality of dorm life, 3) quality of education, 4) student/faculty relationships, and 5) quality of social life.

The multiple linear regression model with the surrogate person variable, however, produced a correlation coefficient value of .76 for the predicted and observed ratings of the holdout universities, as compared to the values of only .37 for the conjoint analysis and .13 for the multiple linear regression model without person variables.

The multiple linear regression model with the surrogate person variable also produced a lower average absolute difference between the predicted and observed ratings for the holdout universities than did the conjoint analysis and the multiple linear regression model without the person variables. The average absolute difference values were 1.50, 1.57, and 1.60, respectively.

Both of the multiple linear regression models produced very little shrinkage in the double cross-validation procedures. The amounts of shrinkage ranged from 1.7% to 5% for Models 1 and 3.

Summary and Implication of Findings

This study compared the results of three approaches used to analyze the rating of universities by students. The conjoint analysis, the multiple linear regression model without person variables, and the multiple linear regression model with person variables produced the same ratings of the five university attributes. The multiple linear regression model with the surrogate person variable, however, was better able to predict the ratings of the two holdout universities than either the conjoint analysis or the multiple linear regression model without person variables.

When considering the implications of this study one must keep in mind two of its facets. First, conjoint analysis may be approached in various ways. In this study only one approach to analyzing the information through conjoint analysis was considered. Second, it should also be noted that in this study the person variables accounted for a statistically and practically significant amount of the variation in the students' ratings. The use of person variables, however, may not improve the researcher's ability to predict consumer ratings of products in all cases. If the variation in ratings between consumers is minimal, the use of person variables may not improve the model's ability to predict.

Thus, the researchers suggest that both conjoint analysis and a multiple linear regression model with person variables be used. Focus should be placed on the results of the procedure that produces the most effective predictions of the holdout values.

Appendix A

Freshman Survey

In this survey we want you to determine which features of a college are important to you. When completing this survey form, consider the five following features:

1) **Financial aid package.** This feature would include the various grants, loans, scholarships, and work-study programs available which can help the student in covering the costs of attending college.

2) **Quality of campus life.** This feature refers to the dormitory living conditions and the quality of food in the cafeteria. The basic areas to consider are clean and spacious living conditions and the quality and variety of food served.

3) **Quality of education.** This feature refers to quality of teaching, career relevance of the curriculum, and general overall reputation of the college.

4) **Social life** on campus. This characteristic refers to the opportunity to meet and interact with other students on campus through various social mixers, dances, and other occasions.

5) **Student/faculty relationships.** This attribute involves the availability of faculty to students, the faculty promoting student development, and giving the students advice on personal as well as professional matters.

WHICH FEATURES ARE MOST IMPORTANT?

We would like to find out, with your help, which features of a college are more important to students. Listed below are descriptions of 10 colleges, each of which provides different amounts and combinations of five college features. Assume that all 10 colleges are equal in all other areas not mentioned.

Please rate these 10 colleges by using a 1 to 10 scale with "1" being not preferred at all and "10" being very much preferred. Try to use a range of numbers like 2, 3, 8, 9, etc. if the particular combination of college features falls somewhere between the two extreme values of 1 and 10.

EXAMPLE:	College	Quality of Education	Student/Faculty Interaction	Social Life	Financial Aid Package	Quality of Campus Life	Rating (1-10 scale)
	"X"	well-known reputation	extremely accessible	few social activities	all financial need is met	above expectations	____

COLLEGE	SOCIAL LIFE	QUALITY OF EDUCATION	STUDENT/FACULTY INTERACTION	QUALITY OF CAMPUS LIFE	FINANCIAL AID PACKAGE	RATING (1-10 SCALE)
"A"	few social activities	reputation not well known	faculty are accessible if sought	below my expectations	little financial need is met	____
"B"	QUALITY OF CAMPUS LIFE: below my expectations	FINANCIAL AID PACKAGE: most financial need is met	SOCIAL LIFE: many social activities	QUALITY OF EDUCATION: reputation well known	STUDENT/FACULTY INTERACTION: faculty are accessible if sought	____
"C"	SOCIAL LIFE: few social activities	QUALITY OF CAMPUS LIFE: above my expectations	FINANCIAL AID PACKAGE: most financial need is met	STUDENT/FACULTY INTERACTION: faculty are extremely accessible	QUALITY OF EDUCATION: reputation well known	____
"D"	QUALITY OF EDUCATION: reputation not well known	STUDENT/FACULTY INTERACTION: faculty are extremely accessible	SOCIAL LIFE: many social activities	FINANCIAL AID PACKAGE: little financial need is met	QUALITY OF CAMPUS LIFE: above my expectations	____

	SOCIAL LIFE	QUALITY OF EDUCATION	QUALITY OF CAMPUS LIFE	STUDENT/FACULTY INTERACTION	FINANCIAL AID PACKAGE	RATING (1-10 SCALE)
"E"	few social activities	reputation not well known	below my expectations	faculty are extremely accessible	most financial need is met	____
	QUALITY OF EDUCATION	STUDENT/FACULTY INTERACTION	FINANCIAL AID PACKAGE	QUALITY OF CAMPUS LIFE	SOCIAL LIFE	
"F"	reputation well known	faculty are extremely accessible	little financial need is met	below my expectations	many social activities	____
	FINANCIAL AID PACKAGE	QUALITY OF EDUCATION	QUALITY OF CAMPUS LIFE	SOCIAL LIFE	STUDENT/FACULTY INTERACTION	
"G"	little financial need is met	reputation well known	above my expectations	few social activities	faculty are accessible if sought	____
	STUDENT/FACULTY INTERACTION	FINANCIAL AID PACKAGE	QUALITY OF EDUCATION	QUALITY OF CAMPUS LIFE	SOCIAL LIFE	
"H"	faculty are accessible if sought	most financial need is met	reputation not well known	above my expectations	many social activities	____
	SOCIAL LIFE	FINANCIAL AID PACKAGE	QUALITY OF EDUCATION	STUDENT/FACULTY INTERACTION	QUALITY OF CAMPUS LIFE	
"I"	many social activities	little financial need is met	reputation well known	faculty are extremely accessible	above my expectations	____
	QUALITY OF EDUCATION	STUDENT/FACULTY INTERACTION	QUALITY OF CAMPUS LIFE	FINANCIAL AID PACKAGE	SOCIAL LIFE	
"J"	reputation well known	faculty are extremely accessible	below my expectations	most financial need is met	few social activities	____

What is your intended major field of study? _____

Are you:

_____ White/Caucasian
_____ American Indian
_____ Hispanic
_____ Black
_____ Other (Specify)
_____

Are you: _____ Male
or
_____ Female

Do you actively participate in any sports programs offered at Ashland College?

_____ Yes _____ No

On the scale from 1 to 10, circle the value that indicates the degree of influence your parents had on your decision to attend Ashland College.

Little Influence Much Influence

1 2 3 4 5 6 7 8 9 10

Please use the space below for any comments that you would like to make about campus life and activities that may not have been covered on this survey. We value any information that you can provide. THANKS AGAIN FOR YOUR COOPERATION!

_____

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References

Bretton-Clark. Conjoint Analyzer, New York, New York, 1987.

Bretton-Clark. Conjoint Analyzer, New York, New York, 1987.

Conant, J., Brown, J., & Mokwa, M. Students are important consumers: assessing satisfaction in a higher education context. Journal of Marketing Education, Summer 1985, 13-20.

Fraas, J. W. & McDougall, W. R. The use of one full MLR model to conduct multiple comparisons in a repeated mesures design: an industrial application. Multiple Linear Regression Viewpoints, 1983, 12 (1), 42-55.

Green, P., Goldberg, S., & Montemajor, M. A hybrid utility estimation model for conjoint analysis. Journal of Marketing, Winter 1981, 45, 33-41.

Green, P., Carroll, J. D., & Goldbert, M. A general approach to product design optimization via conjoint analysis. Journal of Marketing, Summer 1981, 45, 17-37.

Green, P., & Srinivasan, V. Conjoint analysis in consumer research: issues and outlook. Journal of Consumer Research, 1978, 5, 103-123.

Kuh, G., Comes, M., & Lundquist, I. What prospective students really need to know about institutional quality. College and University, Winter 1984, 167-175.

Leigh, T., Mackay, D., & Summers, J. Reliability and validity of conjoint analysis and self-explicated weights: a comparison. Journal of Marketing Research, 1981, 21, 456-462.

McNeil, K., Kelly, F., & McNeil, J. Testing Research Hypotheses Using Multiple Linear Regression. Carbondale: Southern Illinois University Press, 1975.

Pedhazur, E. J. Coding subjects in repeated measures designs. Psychological Bulletin, 1977, 84, 298-305.

Tierney, M. L. Ten questions to ask when choosing a college. Money, November 1984, 133-134.

Williams, J. D. A note on coding the subject's effect in treatments x subject designs. Multiple Linear Regression Viewpoints, 1977 8 (1), 32-35.

Williams, J. D. Multiple comparisons in higher dimension designs, Monograph Series #5, Multiple Linear Regression Viewpoints, 1980, 10 (3).

Williams, J. D. & Williams, J. A. Testing hypotheses in a repeated measures design on employee attitudes with large samples. Multiple Linear Regression Viewpoints, 1985a, 13 (2) 1-20.

Williams, J. D. & Williams, J. A. Testing hypotheses in a repeated measures design: an example. Multiple Linear Regression Viewpoints, 1986, 13 (2), 35.46.