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ABSTRACT

An experiment was conducted to determine if the decision-making process for choosing between alternative job offers by Stanford MBA's is affected by a task requiring an individual to evaluate hypothetical combinations of a limited number of job characteristics. Based on a paramorphic representation of the decision-making process, the ability to predict which job is chosen by the individual does not appear to be influenced by exposure to the task. However, the ability to predict the preference order of the job offers differed significantly between the experimental and control groups. This difference is probably due to a phenomenon similar to the testing effect. Models developed at various levels of aggregation are explored and differences in job preferences related to background variables are noted. For example, female students on the average, appear to be less interested in financial remuneration and less career-oriented than male students, even after adjusting for marital status and other background variables.

INTRODUCTION

Over a decade ago, important contributions to the measurement literature were made by Luce and Tukey (1964), Krantz (1964) and Tversky (1967). After the development of several algorithms (e.g., Kruskal, 1965), the methodology known as conjoint analysis received increasing attention for the development of preference models (Green and Srinivasan, 1978). Recently Montgomery, Wittink and Glaze examined the predictive validity obtained with conjoint analysis in the context of job choices made by MBA students at the Graduate School of Business of Stanford University (Montgomery, Wittink and Glaze, 1977). In this study, several data collection and analysis procedures were compared in terms of predictive validity. One procedure consisted of preference judgments about all possible combinations of the levels of two attributes, holding all other attributes constant (Johnston, 1974). Using an additive model to obtain a paramorphic representation, for each student separately, of the decision making process for jobs, it was possible to predict the job chosen by the individual 57 percent of the time. This was significantly better than the expected hit rate of 28 percent for a random choice model ($p < .01$). Application of an alternative data collection procedure consisting of preference judgments about hypothetical jobs defined on all attributes (Green and Rao, 1971) resulted in a predictive validity of 43 percent. The preference judgments for fully specified objects were analyzed by MONANOVA (Kruskal and Carmone, 1969). This result was also significantly better than the 26 percent expected from randomly choosing between job offers ($p < .01$).

Predictive validity was also measured by the Spearman rank order correlation between the reported preference order for the job offers and the predicted (based on the individualized preference model) order.

When it was determined that some of the students had chosen a job before providing the preference judgments about hypothetical jobs offers, the individuals were classified into two groups. One group consisted of "late" deciders, students who had not accepted a job offer at the time the data had been collected. The "early" deciders had already decided on a position by the time they received the instrument. The invidiualized preference models for the late deciders provided better predictive validity with a hit rate of 55 percent than the early deciders for whom the percentage of job choices predicted successfully was only 37 percent ($p < .10$). The average Spearman rank order for the late deciders was 0.388 compared with 0.021 for the early deciders ($p < .05$).

Several possible reasons for the considerable difference between late and early deciders were advanced. One plausible explanation appeared to be that there was a difference in motivation between the two groups of students. The students who had not yet decided on a job, might have expected to gain insight into how they should choose between job offers. The data collection instrument provided a convenient vehicle for them to think about the relevance of various job characteristics, and the tradeoffs involved. The other students could not benefit in this manner because they had completed the job selection process already, resulting in a lower degree of motivation to provide quality judgments. This is called the motivational effect hypothesis. An alternative explanation for the observed difference consisted of a training effect. In other words, the exercise of providing preference judgments about hypothetical jobs might have influenced how a student would choose between job offers. For example, for the late deciders, the specific eight attributes used in the data collection instrument might have increased in importance. The exercise might have provided training for the students for evaluating actual job offers. This is termed the training effect hypothesis.

An experiment was set up to investigate whether a training effect might have operated. Thus, the null hypothesis is that there is no training effect. If there is insufficient evidence for the training effect hypothesis, then the motivational effect hypothesis is maintained. The possible existence of a training effect was investigated by averaging the parameter estimates for the individualized additive models across the respondents. The results are mixed. If the predictive validity measure used consists of the percentage of job choices predicted accurately then there appears to be no training effect. However, using the correlation between the predicted rank order of preference

for the job offers and the actual rank order as the measure, a training effect appears to exist. Why the existence of a training effect may depend on the validation measure is explored in the "Results" section. We also show how an index of importance for the characteristics derived from the model parameter estimates compares with the importance students claim to attach to these characteristics. Furthermore, we report how selected parameter estimates of the model depend on background variables, such as marital status, geographical background and functional area in which the student may have concentrated while studying at the Stanford Business School. We also report how female and male students differed in their job preferences, and the possible implications of these differences for career patterns.

Experimental Design

In February 1978 half of the second-year MBA students at Stanford University received a questionnaire describing eight job attributes and a number of matrices consisting of all possible attribute combinations for two attributes at a time. The randomly selected students were asked to provide preference judgments about these "jobs" and to answer a few standard questions. For a definition of the eight attributes and an example of a matrix showing some possible attribute combinations, see Exhibit 1. According to the "training-effect" hypothesis, students who received the data collection instrument would be influenced in the decision making process by the attributes used in the instrument and/or the tradeoffs between attributes to be considered in making preference judgments. If this hypothesis is true, then the students receiving the instrument should be more predictable in job choice than their counterparts who formed the control group. In June 1978, all second-year MBA students received a long questionnaire, entitled

EXHIBIT 1

DEFINITION OF ATTRIBUTES AND THEIR LEVELS

A. Business Travel (in nights per month)

1) 1 night or less
2) 2-5 nights
3) 6 nights or more

Explanation: You should assume the job requires you to be away from your home for an average of the specified number of nights per month.

B. Geographical Area in the United States

1) East
2) Midwest
3) South
4) West

C. Company Growth in Constant Dollars (Strategic Business Unit)

1) GNP + 10%
2) GNP
3) GNP - 5%

Explanation: GNP + 10% means that the real current growth for the business unit is 15% if the GNP grows at an annual rate of 5% in constant dollars. GNP -5% means that if GNP grows 5%, the business doesn't grow in terms of constant dollars.

D. Opportunity for Advancement

1) Rapid advancement
2) Moderate advancement

E. Functional Activity

1) Accounting/Auditing
2) Consulting
3) Finance
4) Marketing
5) Other line
6) Other staff

Explanation: "Other line" could include Production. "Other staff" could refer to Corporate Planning or Systems Analysis,

Exhibit 1 (continued)

F. Location of Job

1) Desirable
2) Reasonable
3) Unattractive

Explanation: This characteristic refers to the environment of the place where you work. The combination of work area, living arrangements and commuting are considered in specifying a particular job as either desirable, reasonable or unattractive.

G. Salary (including bonus) in first year of employment

1) Expected salary plus 20%
2) Expected salary plus 10%
3) Expected salary minus 10%
4) Expected salary minus 20%

Explanation: Supposing, given your experience and abilities, you expect to make about $20,000 per year including bonus. "Expected salary plus 10%" would then imply an offer of $22,000.

Please specify your expected salary: $_____

H. People (Colleague, Boss, etc.) in the Company

1) Flexible, Easy to work with
2) Competitive, Cut throat

EXAMPLE

There are sixteen tables which you are asked to complete in this questionnaire. Each table consists of various combinations of only two characteristics. We are interested in knowing how you tradeoff one characteristic against another. In the following example we consider the possible combinations of "Geographical Area" and "Opportunity for Advancement." In evaluating these combinations, we do not make any assumptions about other characteristics.

	Geographical Area			
	East	Midwest	South	West
Rapid	2	4	7	1
Moderate	5	6	8	3

Considering only these two characteristics, suppose you prefer a job in the west with rapid career advancement over all other combinations shown in this table. In that case, you would place a "1" in the cell corresponding to west and rapid, as shown in the table above. If the next best combination is a job in the east with rapid career advancement you place a "2" in the appropriate cell as shown. The third best combination in this example is a job with moderate career advancement in the west, etc. Continuing in this manner, all cells are to be filled in as shown in this example.

In the following tables please indicate which combination of two job characteristics appeals to you the most, which combination is second best, etc. Indicate the rank order to these combinations by using:

1 = most preferred
2 = second most preferred
3 = etc.

Even though you may not feel strongly about some of the combinations presented, please rank order all the cells for all the tables. We need to have your preference for all combinations shown. Obviously, there is no right way to describe your preferences, and it is not necessary to be "rational", consistent or transitive. Keep in mind that the combinations in any particular table do not imply anything about the other characteristics.

Employment Survey, from the Placement Office of the Business School. Three of the f sections of this questionnaire contained questions addressing research issues of interest to members of the faculty. One of these sections was relevant to this study, although the study or the researchers' names were not identified. In this section, students were shown the list and definition of attributes (see Exhibit 1), and they were asked to rate each of the job offers on these attributes, to indicate which offer they had accepted and to rank order the remaining offers according to overall preference.

Because the individuals in the control group did not evaluate hypothetical jobs, no decision model could be obtained for them. To compare the experimental and groups in terms of predictive ability, decision models were developed for each respondent separately in the experimental group. The parameter estimates were then averaged across the respondents. The resulting " "average" decision model or utility function was applied to the job offers for all students in the experimental and control groups to determine the predicted attractiveness for each of the job offers based on this "average" model. Of course, this model would tend to favor the experimental group because the parameter estimates are obtained from the responses they provided. Thus, the sampling error associated with this "average" model may bias the results on predictive validity in favor of the experimental group. For this reason, we also obtained an "average" utility function based on responses provided to the same data collection instrument by students who graduated in 1977.

Results

A total of 155 second-year MBA students reported receiving at least two job offers in the United States. Those who had not received the first

questionnaire consisting of tradeoff matrices (see Exhibit 1), were included in the control group. The experimental group was further subdivided into respondents - students who had returned the first questionnaire - and non-respondents. Separate analysis of these two subgroups showed that the predictive validity was somewhat higher for the nonrespondents in the sample, but the difference was not significant statistically. Of course, the non-respondents may have used the questionnaire for their own benefit, and hence they may have been influenced by the instrument. The results for the experimental and control group are summarized in Table 1. For both models A and B, there is statistically no significant difference in the percentage of hits between the experimental and control groups. Note that the expected percentage of hits for a random choice model is slightly higher for the control group, reflecting the fact that, on the average, individuals in the control group reported a slightly smaller number of job offers. However, if the correlation between the reported rank order of preference for the job offers and the predicted rank order is taken as the measure of predictive validity, a significant difference in favor of the experimental group is obtained for both models A and B ($p < .05$). As expected, the difference is somewhat smaller when model B is used, because this model is derived from the tradeoff data supplied by the individuals in the experimental group.

At first glance, it seems contradictory that the experimental and control groups differ in predictive validity as measured by Spearman rho, but not in the percentage of first choices predicted accurately. Taken literally, the results suggest that there is an instrument effect on the preference ordering of the job offers but not on the actual job choice. The explanation can perhaps be found when we consider the task of providing information about job choice and job offers. As we indicated in the experimental design section of this paper, all students were asked to respond to a

TABLE 1

Predictive Validity for the Experimental and Control Groups

	Experimental Group	Control Group	t-ratio
Model A[1] Percentage of Hits	0.496[2]	0.506[2]	-
Model B[1] Percentage of Hits	0.468[2]	0.469[2]	-
Expected from Random Choice	0.266	0.293	-
Model A Average Spearman rho	0.517[2] (0.462)[3]	0.318[2] (0.643)[3]	2.23 ($p < .05$)
Model B Average Spearman rho	0.484[2] (0.485)[3]	0.335[2] (0.633)[3]	1.66 ($p < .05$)
Sample size	74	81	

[1]Model A is an average utility function computed by averaging the individual utility functions across all respondents to the tradeoff questionnaire in 1978; Model B represents the average utility function for all respondents to the tradeoff questionnaire in 1977.

[2]These percentages and averages are significantly different from what is expected for the random choice model ($p < .01$).

[3]Standard deviations are shown in parentheses.

long questionnaire about employment. Section four of this questionnaire was directly relevant to this study. It is quite likely that the individuals in the experimental group recognized this section as being related to the instrument about hypothetical combinations of job attributes. The control group, on the other hand, could not have known for whom the information provided in section four were intended.

The task of indicating which job was chosen should not have presented a problem to the students in either group. However, rank ordering the remaining job offers may have been an artificial exercise. We hypothesize that the experimental group was more involved in providing the rank orders because they knew for whom and for which study the data were collected. Although we did not measure involvement differences between the two groups, we can examine some possible implications. For example, the control group provided information on 3.68 offers, on the average, compared to 4.00 offers for the experimental group. It is possible therefore, that some individuals in the control group neglected to report all job offers received. If they tended to leave out the least desirable job offers, and if these job offers would have been easy to predict, then the Spearman rho would be "depressed" for the control group. Alternatively, individuals in the experimental group may have relied more heavily on the eight job attributes used in the instrument to be as consistent as possible in the rank ordering whereas the control group would have lacked the interest to do so.

To examine whether the average Spearman rho for the control group could be "biased" downward because students in that group tended not to mention some of the least desirable offers, we computed the Spearman rho for a subset of the offers reported by students in the experimental group. Specifically, to get insight into this effect, the least desirable job offer was eliminated

for all individuals in the experimental group with more than two job offers. The result was a very dramatic drop from 0.484 based on all reported offers (see Table 1) to 0.262 when the offer with the lowest rank was ignored. Thus, the difference in average Spearman rho obtained between experimental and control group could easily be due to a tendency on the part of at least some individuals in the control group not to list all job offers. However, we cannot rule out the possibility that the individuals in the experimental group relied more heavily on the eight job attributes when providing the preference rank ordering of the job offers. It is conceivable therefore, that there is an instrument or training effect associated with artificial tasks unrelated to actual behavior. This suggests rather strongly that the choice of a validation measure can influence the conclusions about experimental effects in a critical manner. The need for behavior-based measures is established quite clearly in this example.

In terms of decisions made, there appears to be no training effect due to the task of evaluating hypothetical combinations of job attributes. Thus, the hypothesis that motivation accounted for the difference in predictive validity between late and early deciders (Montgomery, Wittink and Glaze, 1977) is sustained. The implication is that in research studies where data are collected to model the decision making process of individuals, the quality of the data can be enhanced considerably by choosing individuals who are likely to be interested in the task required by the data collection instrument.

Parameter Estimates for Model A. Although there are differences between individuals in terms of the preferences they have for job attributes, it is instructive to examine the values for the utility function computed across all individuals in the experimental group. For each attribute level,

both the average and the standard deviation are shown in Table 2. These parameter estimates have interval scale properties; the origin is arbitrary. The solution provided by the algorithm applied to the tradeoff data uses zero as the origin (Johnson, 1974; Nehls, Seaman and Montgomery, 1976) so that the parameter estimates sum to zero. The parameter estimates indicate how important it is for the MBA student, on the average, to obtain a job with the particular characteristic. For example, the highest average value is associated with the geographic area "West", while the lowest value is obtained for salary equal to "Expected -20%." The standard deviations provide an index of the variability among the students in the desirability of the characteristics. Thus, students vary particularly in their preference assessment for geographic area and functional activity. This suggests that it is particularly important to allow for differences in the parameter estimates for those attributes.

To summarize the relative importance of each of the attributes used to model job choice, we compute the difference between the largest and the smallest parameter estimate for each attribute. This summary measure of importance is, of course, relevant only for the specific amount of variation associated with the attribute. The rank order of attributes in terms of this index of derived importance weights is shown in Table 3. From this table we can see that salary, varying from 20 percent more than expected to 20 percent less than expected, is more important than the other attributes, on the average. However, the attributes geographic area and work environment follow very closely in importance. Least important, on the average are the attributes business travel and opportunity for advancement. It is interesting that if students are asked to rank these eight attributes directly in order of importance, the results are quite different. The last column of Table 3 shows the

TABLE 2

Average Utility Function Based on Respondents in the Experimental Group

ATTRIBUTE	Average	Standard Deviation
- Business Travel Per Month		
< 1 nights	0.163	0.188
2-5 nights	0.109	0.103
≥ 6 nights	-0.273	0.188
- Geographic Area		
East	0.070	0.336
Midwest	-0.198	0.270
South	-0.321	0.302
West	0.449	0.320
- Company Growth		
GNP + 10%	0.258	0.157
GNP	0.064	0.079
GNP - 5%	-0.322	0.191
- Opportunity for Advancement		
Rapid	0.216	0.113
Moderate	-0.216	0.113
- Functional Activity		
Accounting	-0.460	0.347
Consulting	0.161	0.314
Finance	0.095	0.293
Marketing	0.150	0.353
Other Line	0.019	0.311
Other Staff	0.035	0.262
- Work Environment		
Desirable	0.362	0.131
Reasonable	0.115	0.075
Unattractive	-0.477	0.145
- Salary		
Expected + 20%	0.407	0.167
Expected + 10%	0.233	0.095
Expected - 10%	-0.151	0.109
Expected - 20%	-0.489	0.180
- People		
Flexible	0.335	0.139
Competitive	-0.335	0.139
Sample Size	74	

Table 3

Rank Order of Job Attributes

Attribute	Range	Derived Importance Weights[1]	Stated Importance Weights[2]
1. Salary	± 20% from expected value	1.00	5.26
2. Geographic Area	east, midwest south, west	0.96	2.94
3. Work Environment	desirable to unattractive	0.94	5.00
4. People	flexible to competitive	0.75	2.77
5. Functional Activity	accounting, consulting, etc.	0.69	3.27
6. Company Growth	GNP -5% to GNP +10%	0.65	6.41
7. Business Travel	≤ 1 night to ≥ 6 nights per month	0.49	6.61
8. Opportunity for Advancement	rapid to moderate	0.48	3.67

[1] The derived importance weights have been standardized so that the most important attribute has an index of one, and the weights for the other attributes can then be interpreted as a proportion of the importance for salary.

[2] The lower the average stated importance weight, the more important the attribute.

arthmetic average of the rank orders across all respondents in the experimental group. Using the stated importance weights, geographic area is the most important attribute and salary is only the sixth most important job characteristic. Thus, there appears to be considerable difference between how individuals use the attributes to choose between hypothetical jobs and how much they say they will rely on the attributes for evaluating alternative job offers. If the two indices of importance weights match perfectly, the Pearson product-moment correlation coefficient would be -1.00. The large discrepancy between the two indices of attribute importances is indicated by a correlation coefficient of only -0.219, which is not significantly different from zero.

Monetary Value of Attribute Levels. From the results shown in Table 2, we can also determine the marginal utility obtained by varying the level of any attribute. For example, for salary, the marginal utility associated with increasing the salary from 20 percent below expected to 10 percent below expected is 0.338. However, comparing 10 percent above to 20 percent above yields a marginal utility of only 0.174. Thus, the marginal utility of salary appears to depend on the levels that are being compared. As expected, the marginal utility of a constant amount of money decreases as the amount to which it is added increases. This underscores the necessity for specifying the range of variation as well as absolute levels for an attribute in order to get reasonable answers about the importance of the attributes to decisions.

The utility associated with any attribute level, as shown in Table 2, can be transformed to a monetary value by using the utility for the starting salary attribute. To do this the median starting salary for Stanford MBA's in 1978 of $24,000 is substituted for expected salary. Monetary values

have been computed separately for three salary ranges because the marginal utility of money decreases as the salary increases. This means that the absolute amount of money (in terms of starting salary) needed to make a given job offer more attractive to the MBA student increases as the reference value for salary goes up. Marginal monetary values for the attribute levels are shown in Table 4. For each attribute the least desirable level is taken as a base (i.e., zero value) and the values for the other levels show how much money will make the student indifferent, on the average, between that level and the least desirable level. For example, for the $19,200 to $21,599 salary range, a student is expected to be indifferent between a job in the west and a similar job in the south that pays $6,240 more. If the base salary is in the higher range ($26,400 - $28,799), the job in the south would have to pay $12,096 more than the job in the west, for an MBA student to be indifferent between the two otherwise indistinguishable jobs. Thus, as the base salary goes up, it becomes increasingly difficult to use money to attract the "average" Stanford MBA student to a job in the south. However, it may be possible to increase the attractiveness of the job by using attributes other than salary. These results are, of course, based on the students' perception of the job attributes as they existed in March 1978 when the preferences were elicited. It is quite conceivable, for example, that a job interview in the south after the tradeoff questionnaire was filled out would change the perception of this region, especially for those students who have never visited the south. Furthermore, the desirability of a job in the south may depend also on the more specific area. Students' preferences for a job in Houston, Texas may differ considerably from the preferences for a job in Tuscaloosa, Alabama. Differences between these cities may be reflected partly by the attribute "work environment" but the point is that it is not clear whether a person thinks of Houston or Tuscaloosa when evaluating a job in the south.

Table D

Marginal Monetary Value (in Terms of Annual Starting Salary) for Each Attribute Level

ATTRIBUTE	SALARY		
	$19,200-$21,599	$21,600-$26,399	$26,400-$28,7
- Business Travel Per Month			
≤ 1 night	$3,185	$5,341	$6,174
2-5 nights	$2,795	$4,687	$5,418
≥ 6 nights	0	0	0
- Geographic Area			
East	$2,860	$4,796	$5,544
Midwest	$ 910	$1,526	$1,764
South	0	0	0
West	$6,240	$10,464	$12,096
- Company Growth			
GNP + 10%	$4,225	$7,085	$8,190
GNP	$2,795	$4,687	$5,418
GNP -5%	0	0	0
- Opportunity for Advancement			
Rapid	$3,120	$5,232	$6,048
Moderate	0	0	0
- Functional Activity			
Accounting	0	0	0
Consulting	$4,485	$7,521	$8,694
Marketing	$4,420	$7,412	$8,568
Finance	$4,030	$6,758	$7,812
Other Staff	$3,575	$5,995	$6,930
Other Line	$3,445	$5,777	$6,678
- Work Environment			
Desirable	$6,110	$10,246	$11,844
Reasonable	$4,615	$7,739	$8,946
Unattractive	0	0	0
- Salary			
$28,800	--	--	$2,400
$26,400	--	$4,800	0
$21,600	$2,400	0	--
$19,200	0	--	--
- People			
Flexible	$4,875	$8,175	$9,450
Competitive	0	0	0

Average Utilities by Segments for Selected Attributes

On a priori grounds it was decided that the utility associated with specific attributes might depend on certain background characteristics. Limited information was collected on the individuals included in the experimental group. These students were asked to give their age, sex, and marital status, and to indicate the number of children, if any, they had, what functional area they concentrated in at Stanford, and in what country or state they had lived the longest. By examining the variability (standard deviation) across individuals in the utility associated with the levels of each job attribute (see Table 2), we decided that it would be appropriate, in particular, to allow for segment differences in the utilities for business travel, geographical preference and functional activity. Specifically, marital status (single or married) was used as a segmentation variable on the attribute business travel. It was hypothesized that married students would be less interested in jobs that require a considerable amount of travel, compared with their unmarried counterparts. Geographical preferences were assumed to be a function of the area of the country in which a person had lived the longest. It seemed to us that at least the extent of exposure to a geographical area would influence the desirability of living in various areas. With respect to functional activity, it is obvious that the subjects a student has concentrated on at Stanford should relate to the revealed preference for jobs in different functional areas. For example, students taking a large number of marketing and marketing-related courses* would be expected to have a higher preference for a job in marketing than, say, in accounting. Similar arguments can be applied to students who concentrate in accounting, finance, etc.

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*MBA students at the Stanford Graduate School of Business do not have to declare a major.

Segmentation Results

The partial utility functions for the selected segments are shown in Tables 5, 6 and 7. Table 5 shows that married students have a higher positive preference for business travel of less than or equal to one night per month and a higher negative preference for business travel of more than or equal to six nights per month. This difference is in the hypothesized direction. For each attribute level, the derived utilities were analyzed separately by Analysis of Variance**. The strength of the relationship between the segmentation variable and the level of the job attribute is indicated by the statistic eta squared. For example, for infrequent ($\leq$ 1 night per month) travel, 6.3 percent of the variation in utilities among MBA's has been explained by marital status ($p < .05$).

The results are somewhat stronger for geographical background. As shown in Table 6, students who lived the longest in the east still prefer jobs located in the west. On the other hand, students from the mid west have a slight preference for the east, on the average, compared with the west. Students from the south have a very strong preference for the west, while south is a distant second. Notice, however, that students from the south comprise the only segment for whom south is the second preferred area. Otherwise, except for students from the east (for whom the preference for the south is just slightly less negative than for the midwest) the south

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** It would have been more appropriate, theoretically, to analyze the results by Multivariate Analysis of Variance. However, since the value in the last row is linearly dependent on the values in the first two rows, one row would have to be eliminated from the analysis. Multivariate Analysis of Variance would not have indicated separately by attribute level the percentage of variation explained by the background variable.

Table 5

Utilities by Segment

Segmentation Variable: Marital Status[a]
Job Attribute: Business Travel

	Marital Status				
Travel	Married	Single	η^2	F	p
$\leq$ 1	0.214[b] (0.184)[c]	0.120 (0.182)	.063	5.40	<.05
2-5	0.127[b] (0.111)	0.095 (0.096)	.024	1.98	
$\geq$ 6	-0.340[b] (0.168)	-0.214 (0.188)	.113	10.15	<.01
n	38	44			

a) The question asked: married, yes _____ no _____

b) This number represents the average utility for married students

c) The number in parentheses represents the standard deviation

Table 6

Utilities by Segment

Segmentation Variable: Geographical Background[a]
Job Attribute: Geographical Area in the U.S.

Geographical Background

Geographical Area	East	Midwest	South	West	Foreign	η^2	F	p
East	0.160[b] (0.345)[c]	0.138 (0.385)	-0.168 (0.385)	0.001 (0.295)	0.260 (0.195)	.122	2.65	<.0
Midwest	-0.306[b] (0.231)	0.034 (0.375)	-0.254 (0.375)	-0.187 (0.164)	-0.240 (0.207)	.157	3.55	<.0
South	-0.299[b] (0.315)	-0.298 (o.323)	-0.099 (0.323)	-0.394 (0.300)	-0.330 (0.269)	.079	1.64	
West	0.444[b] (0.265)	0.127 (0.366)	0.521 (0.293)	0.580 (0.261)	0.310 (0.303)	.244	6.13	<.01
n	20	12	8	33	8			

a) The question asked: In what country or state have you lived the longest?

b) This number represents the average utility for students who said they lived in the east the longest

c) The number in parentheses represents the standard deviation

Table 7

Utilities by Segment

Segmentation Variable: Functional Area of Concentration[a]
Job Attribute: Functional Activity

Functional Area of Concentration

Functional Activity	Accounting	Finance	Marketing	Public Mgt	Gen Mgt	Other	η^2	F	p
Accounting	0.289[b] (0.058)[c]	-0.276 (0.310)	-0.682 (0.246)	-0.640 (0.160)	-0.567 (0.203)	-0.516 (0.329)	.350	8.19	<.01
Consulting	-0.065[b] (0.042)	0.103 (0.305)	0.159 (0.318)	0.168 (0.171)	0.233 (0.288)	0.250 (0.348)	.049	0.79	
Finance	0.284[b] (0.150	0.297 (0.199)	-0.044 (0.259)	-0.350 (0.004)	0.077 (0.195)	-0.022 (0.306)	.344	7.99	<.01
Marketing	-0.143[b] (0.315)	-0.087 (0.219)	0.587 (0.255)	0.053 (0.216)	-0.120 (0.095)	0.144 (0.187)	.644	27.45	<.01
Other Line	-0.099[b] (0.224)	-0.049 (0.316)	0.030 (0.253)	0.254 (0.340)	0.236 (0.228)	0.031 (0.370)	.072	1.18	
Other Staff	-0.265[b] (0.141)	0.012 (0.254)	-0.050 (0.184)	0.515 (0.203)	0.142 (0.219)	0.114 (0.296)	.182	3.37	<.01
n	2	30	22	2	6	20			

a) The question asked: What functional area, if any, are you concentrating in at Stanford?

b) This number represents the average utility for students who concentrated in accounting

c) The number in parentheses represents the standard deviation

always places last. Students from the west also have a strong preference for a job in the west, while foreign students on the average prefer either the west or the east over the midwest and the south. It is quite possible that further distinction between, say, students from Western Europe and students from Mexico and the Far East would show that the European students prefer the east and the other foreigners prefer the west. The explanatory power is highest for the utilities for the west as indicated by the value for eta squared of .244* ($p < .01$).

Finally, the results obtained by using Functional Area of Concentration to explain differences in utilities for Functional Activities are shown in Table 7. The results have considerable face validity. For example, the two accounting "majors" prefer accounting and finance jobs. The finance majors prefer finance jobs, but have a strong negative preference for accounting jobs. The derived utilities for functional areas are especially different for marketing "majors." As expected, marketing jobs are strongly preferred, but it is also interesting to see the extremely strong negative preference for accounting jobs. The results are quite strong for several of the attribute levels. For marketing jobs, the proportion of variation explained by Functional Area of Concentration equals 64.4 percnet ($p < .01$). However, the observed differences in average utilities for Consulting jobs and positions categorized as "Other Line" are not statistically significant*. Significant F-rations are obtained for Accounting, Finance and Other Staff Jobs.

Although most of these segmentation results are statistically significant and demonstrate differences in the expected direction, it has not yet been shown that the predictive validity is improved as a result of allowing for such

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*If an adjustment is made for degrees of freedom, the value becomes .194.

*Adjusting eta squared for degrees of freedom would result in negative values for these two attribute levels.

differences. To examine this, the following procedure was adopted. For each individual, the background variables - marital status, geographical background and functional area of concentration - are used to obtain, respectively, the utility values of job attributes travel, geographic area and functional activity. The utilities for the other attribute levels represent simply the average values across all respondents, as shown in Table 2. The results are shown in Table 8. For comparison purposes, we have included the predictive validities for several alternative models. In terms of predicting the job chosen, we see that we would expect to be successful 26.2 percent of the time if we have no information about the job offers. A naive model based on highest salary predicts only 30.9 percent of the choices correctly. Using the average utility function as our model, we obtain a hit rate of 45.8 percent. Distinguishing between individuals by the three background variables as shown in Tables 5, 6 and 7 did improve the predictive validity further. The segment-based utilities predicted 54.2 percent of the job choices correctly. However, using the individualized utility functions for predicting job choice does still better, as indicated by the 63 percent success rate. Thus, there are other individual differences not accounted for by the three background variables. Because only a few background variables were measured at the time the tradeoff data were collected no attempt was made to develop other segments. There is, however, one other variable that produces differences between groups that are noteworthy.

Differences Between Female and Male Students

It has been of considerable interest to researchers in a variety of fields to determine whether female and male workers receive equal pay (e.g., Seidman, 1978) and whether there are differences in job satisfaction and expectation (e.g., Johnston, 1975). Many companies are involved in costly

Table 8

Predictive Validity for Several Models

Model	Percentage First Choice Hits	Average Spearman Rho
Random Choice Model	0.262[1]	0[1]
Naive Model (Highest Salary)	0.309	0.170
Average Utility Function	0.458[2]	0.500[2]
Segment-Based Utilities	0.542	0.557
Individualized Utility Functions	0.630	0.591
Sample Size	48	

[1] These are expected values.

[2] These numbers differ from the results in Table 1, because they are based on the respondents to the tradeoff questionnaire only (i.e., the sample size is smaller).

litigation involving the possible discrimination against minorities, including women, in financial remuneration and promotion. Recently, in a refutation of previous research, it has been suggested that sex differences in work behavior may be due to differences in opportunity between sexes (Lirtzman, and Wahba, 1972; Kanter, 1977). Thus if women are less motivated to be promoted, this may be due to the fact that the objective prospects for advancements are substantially less for women (Homall, 1974). Although corporations and institutions may indeed influence the motivational level differently for the sexes, it is of interest to see if there are differences in career preferences before individuals enter the organizations on a permanent basis.

In this study, sex of the respondents was measured as one of the background variables, so that female and male students can be compared in their preferences for the eight job attributes. The indirect measurement of the value or importance the students attach to the job attributes is expected to enhance the validity of the measurements. In Table 9 average utilities are shown separately for female and male students. The data were subjected to Analysis of Variance, the criteria variable being the utility for a particular attribute level with sex (0, 1) as a predictor variable. Statistically significant ($p < .05$) were obtained for four of the attributes. Most notable are the differences in preference for salary (male students are more interested in obtaining a high salary), opportunity for advancement (male students are more interested in rapid advancement) and geographic area (female students have a higher preference for the west). The greater importance attached by men to obtaining a high starting salary is consistent with the finding that there is a sex difference in the importance of wealth as measured by expected peak salaries (Gordon and Strober, 1978). However, our findings suggest that the sexes may also differ in preference for "opportunity for advancement,"

TABLE 9

Average Utilities by Sex

ATTRIBUTE	Female	Male	η^2	F	P
- Business Travel Per Month					
< 1 night	0.15	0.17	.001	0.09	
2-5 nights	0.08	0.12	.023	1.91	
≥ 6 nights	-0.24	-0.29	.014	1.09	
- Geographic Area					
East	0.13	0.05	.014	1.09	
Midwest	-0.30	-0.16	.051	4.29	<.05
South	-0.44	-0.28	.055	4.63	<.05
West	0.60	0.39	.084	7.32	<.01
- Company Growth					
GNP + 10%	0.22	0.27	.017	1.42	
GNP	0.06	0.07	.004	0.33	
GNP - 5%	-0.28	-0.32	.018	1.49	
- Opportunity for Advancement					
Rapid	0.16	0.24	.100	8.85	<.01
Moderate	-0.16	-0.24	.100	8.85	<.01
- Functional Activity					
Accounting	-0.48	-0.45	.001	0.07	
Consulting	0.20	0.15	.005	0.42	
Marketing	0.21	0.13	.011	0.88	
Finance	0.05	0.11	.088	0.65	
Other Line	-0.08	0.05	.036	2.98	<.10
Other Staff	0.09	0.01	.019	1.53	
- Work Environment					
Desirable	0.35	0.36	.001	0.10	
Reasonable	0.09	0.13	.051	4.25	<.05
Unattractive	-0.44	-0.49	.022	1.81	
- Salary					
Expected + 20%	0.32	0.44	.111	9.99	<.01
Expected + 10%	0.19	0.25	.073	6.29	<.05
Expected - 10%	-0.10	-0.17	.082	7.17	<.01
Expected - 20%	-0.41	-0.52	.078	6.75	<.05
- People					
Flexible	0.34	0.33	.000	0.00	
Competitive	-0.34	-0.33	.000	0.00	
n	22	60			

Corporations and institutions may therefore be using different strategies for attracting female and male MBA's. This can be seen easily when the utilities in Table 9 are converted into monetary values. The most notable difference emerging, when the marginal monetary values are compared, is associated with the preference for geographic area. For example, in the $19,200 to $21,599 salary range, a male student is expected to be indifferent between a job in the west and a similar job in the south that pays $3,819 more. For a female student the salary increase needed to make her indifferent is $8,000. When the salary base is in the $26,400 to $28,799 range, the male student would tend to need $6,800 to be indifferent, while the female student requires $20,000 extra! Thus, female students are very unlikely to take a job in the south, particularly when they have job offers from companies in the west with a reasonable salary. The greater preference for the west on the part of female Stanford MBA students could, of course, result from being committed to the west coast by marital or other bonds. However, it is also possible that they perceive the work atmosphere at companies in the south to be more hostile to women. Furthermore, the lower preference for salary on the part of female students may be due particularly to married females whose incomes may be taxed heavily on the margin when added to those of their spouses.

To see if marital status would eliminate the observed differences between female and male students, we computed derived importance weights separately for the two sexes by marital status. The results are shown in Table 10. The importance weights are standarized so that for each subgroup the value 1.00 is associated with the most important attribute. It is clear that, even though there are differences between married and unmarried students, geographic area is the most important attribute for females and salary is the dominant attribute for males. Thus, differences between the sexes persist

Table 10

Rank Order of Job Attributes
in Terms of Derived Importance Weights

Attribute	Overall Average	Married Female	Single Female	Married Male	Single Male
1. Salary	1.00	0.55	0.78	1.00	1.00
2. Geographic Area	0.96	1.00	1.00	0.58	0.83
3. Work Environment	0.94	0.82	0.74	0.90	0.88
4. People	0.75	0.53	0.71	0.71	0.68
5. Functional Activity	0.69	0.44	0.80	0.67	0.68
6. Company Growth	0.65	0.28	0.59	0.62	0.65
7. Business Travel	0.49	0.56	0.27	0.55	0.38
8. Opportunity for Advancement	0.48	0.33	0.28	0.47	0.53

even when marital status is controlled for. Of particular note is the very low importance married males attach to geographic area. They consider themselves apparently very mobile. It is also noteworthy that the married female students care particularly about the geographic area and the work environment, two variables that have nothing to do with the job itself. This is a strong indication that on the average, married female students are not as career oriented. However, both married and unmarried female students have a very low preference for opportunity for advancement, compared with the male students. This suggests that even the single female students may not be as career oriented as either the married or the unmarried male students.

The distinctions between the four groups can be explored further by computing Pearson product-moment correlations between the vectors of importance weights. Based on the zero-order correlation matrix, we find that in terms of attribute importance, married females are most similar to unmarried females ($\hat{\rho}$ = 0.597) while unmarried females are most similar to unmarried males ($\hat{\rho}$ = 0.802). For the male students, the results are symmetric in that married males are most similar to unmarried males ($\hat{\rho}$=0.813) and vice versa. Thus, marital status tends to differentiate females more so than males.

It is not our intention to add to the stereotyping of behavior by comparing female and male MBA's on the preferences for job attributes. Rather, we wish to point out that the differences in career opportunities between the sexes may result partly from differences in career interests existing <u>before</u> individuals join organizations. We agree with other researchers (e.g., Lipman-Blumen and Leavitt, 1976) that occupations should not be linked to the sex of an individual. Our results suggest, however, that at least some of the individual differences in career preferences can be explained by sex.

The question remains whether such sex differences existed before the students entered the business school, whether they were shaped by the socialization process at the business school and/or whether they were influenced by the experience of the summer jobs.

CONCLUSIONS

The possibility of a training effect on job choice resulting from exposure to an instrument requiring preference judgments about hypothetical jobs was investigated. The percentage of job choices predicted correctly was found not to be affected by exposure to the data collection instrument. However, a statistically significant difference in the Spearman rho for the actual rank order of job offers and the predicted rank order was obtained. This appeared to be the result of something like a testing effect in that the individuals in the experimental group may have been more careful about providing "quality" judgments about the complete set of job offers.

Although these results were based on a preference model for which the parameter estimates were averaged across the respondents, substantial individual differences in the preference for job attributes were found to exist. Some of the differences were linked to background variables, and the predictive validity of the resulting model exceeded the predictive validity for the model obtained by averaging across the respondents. The predictive validity was highest, however, when the preference model's parameter estimates were obtained separately for each individual. Differences between the sexes in job preferences were also noted. Female students appeared to be less interested in "opportunity for advancement" and "high" salary than their male counterparts. The women tended to have stronger geographic preferences.

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