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What Is Measured with Student Selection Interview: A Conjoint Analysis Study

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Abstract: The aim of this study is to determine which variables are prior characteristics in student selection interview. The sample was consisted of 154 academicians. A pilot study was conducted to determine variables which may be important for selection of students and seven variables were found. These variables were LES (Graduate Education Test like GRE) score, Proficiency of Foreign Language (POFL), the purpose of student (POS), whether there is any Reference (R), Communication Skill (CS), GPA (grade point average), whether s/he was a student of interviewer in undergraduate education (WIS). Data were collected through 154 academicians. Data were analyzed using conjoint analysis. Results indicated that while "purpose of student" was the most, "whether s/he was a student of interviewer in undergraduate education" was the least important variable for selecting students.

Key words: Selection interview · conjoint analysis · trade off analysis · graduate education

INTRODUCTION

Interview is one of the most frequently used selection methods [1-3] and can be classified as panel interview and individual interview, according to the number of interviewers and their contribution to evaluation. If the interview is carried out with only one interviewer, then this is called individual interview. Panel interview, also known as a board interview, is defined as an interview conducted by a team of interviewers (usually two to three), who interview the candidate simultaneously, then combine their ratings into a final panel score [4].

There are numerous studies about reliability and validity of interview. While findings from studies which were made until 1980s were quite pessimistic about psychometric properties of interview [5], after 1980s by contribution of meta-analytic methods better results were attained. However validity scores of interview weren't adequately high. To improve low coefficients, panel interview was used instead of individual interview and structured interview was used instead of unstructured interview, so little progress was achieved. All meta-analytic studies showed that structured interview gave better results (0.44) than unstructured interview (0.33) [6]. In the studies on validity of interview, coefficients of prediction validity changing from 0.14 to 0.62 were obtained. In their studies, coefficients of prediction validity had been obtained as 0.19 by Rely and Chao [7] 0.14 by Hunter and Hunter [8], 0.62 by Weisner and Cronshaw [9] in structured interview, 0.31 by Marchese and Muchinski [10] and 0.32 by Salgado and Moscoso [5] in unstructured interview.

Also in studies about construct validity of interview, the question of what is measured with interview is considered and its components were tried to be determined. By making literature review Harris [11] concluded that factors which were measured with interview could be tacit knowledge, job knowledge, skills and abilities or person-organization fit. Further, Huffcutt, Roth and Conway [12] defined different dimensions which were commonly seen in job interview. These dimensions were mental capability (general intelligence and applied mental skills), personality tendencies (basically big five factors), social skills (communication skills, interpersonal skills), interests and preferences (company, type of work); organizational fit (values), background credentials (education, experiment, job knowledge) and the other characteristics (creativity, physical attributes). Some of these dimensions were found higher correlated with job performance than others. For example, the relationship between person-organization fit and job performance was 0.53.

Roth and Campion [13] had examined the prediction power of panel interview and pre-employment test and found that interview correlated with knowledge 0.21, general ability 0.15, education 0.09, job performance 0.34

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and promotion 0.16. Ramsay and Gallois [14] had applied principal components analysis to interview question scores and determined two factors which were named as special presentation skills and interpersonal competence. These two factors had explained 49 percent of total variance.

Although the validity of selection interview is controversial, it is possible to obtain important information which can not be gained by other ways about candidates' success [15]. This characteristic of interview had oriented studies which aimed at improving characteristics of interview instead of giving up the interview. In certain studies, some precautions on improving the reliability and the validity of interview could be suggested. Cliffordson [6] determined that using a panel interview or more than one independent interviewer could improve the reliability of interview. Also, it was determined that making structured interview could improve the validity of interview [16]. Even if form of interview is improved, the studies show that ability tests and the other variables determined before is not sufficient to explain the interview.

Conjoint analysis: While survey research is limited in its capability to manipulate or control for interactions between variables which are effective for preference of product, service and other things, conjoint analysis attempts to address this problem [17]. Conjoint analysis models the tendency of client' trade-offs among multi-characteristic products or services. The model supposes that alternative product concepts can be defined as a series of specific levels of a broad set of properties [18]. It also assumes that the total utility which the consumer provides from a product is determined by the utilities or part-worth contributed by each characteristic level. Conjoint analysis begins with the consumer's overall judgments about a set of complicated alternatives [19]. It then executes a decomposition of the initial judgments of the consumer into separate and proper utility scales, by which the original overall evaluations can be reconstituted. Being able to dissociate overall judgments into components, hereby, can be provided useful information about the relative importance of several characteristics of a product. It can also provide information on the value of various levels of a single characteristic. Therefore the aim of conjoint analysis is to determine the attribute combination which confers the highest utility to the consumer and the relative importance of attributes in terms of their contribution to total utility.

Conjoint analysis basically contains six steps:

(1) Selection of the relevant attributes;
(2) Determination of the attribute levels of intensity;
(3) Configure attributes and levels into the individual concepts and design the data collection instruments;
(4) The estimation method;
(5) The analysis of the data and interpretation of their results [20].

Conjoint analysis is especially used for marketing research [21]. In this study, although there isn't any customer and product, goods or service to be offered to customers, when the faculty members are accepted as customers and candidate students as product in education system, it can be seen that conjoint analysis can be applied to this study. In acceptance of students for graduate education in Turkish universities interview is used. Because some variables may be more effective during the interview than others for probability of acceptance, it is particularly critical to clarify which variables are important for interviewers. Although there are some researches which examine construct validity of interview, no of them use conjoint analysis as a statistical method. This study can be accepted as construct validity, since it aimed to determine the importance of the variables effecting the acceptance decision on panel interview for selection of graduate students. The purpose of this study is to determine which variables are prior characteristics in student selection interview for graduate education.

MATERIALS AND METHODS

Participants: Data were collected from totally 154 faculty members, 35 of which were from Hacettepe University's College of Education, 18 of which from Faculty of Literature, 12 of which from Faculty of Science of Economic and Administrative, 18 of which from Faculty of Arts, 46 of which from Faculty of Science, 25 of which from Faculty of Engineering. Distribution of these 154 faculty members according to institutes are as 83 of Social Science and 71 of Pure and Applied Science. These faculty members took part in the student selecting jury.

Procedure: There are a number of steps in the procedure of this study. Firstly some academicians were interviewed to determine the required variables and to gather information about what kind of variables were effective on selection of students for graduate education. And

Table 1: Variables, level of the variables and their categorical values

Attributes	Levels	Categories
LES score (LES)	Between 45-54	1
	Between 55-64	2
	65 and above	3
Foreign language		
Proficiency (POFL)	Proficient	1
	Not proficient	2
Purpose of Student (POS)	Uncertain	1
	To develop own quality	2
	To build academic career	3
Reference (R)	Exist	1
	Not Exist	2
Communication Skill (CS)	Low 1	
	Medium	2
	High 3	
Academic grade (GPA)	Between 2.50-3.00	1
	Between 3.01-3.50	2
	Between 3.51-4.00	3
Whether he/she is		
interviewers' student (WIS)	Yes 1	
	No 2	

Table 2: Two examples of profile cards

Card I	Candidate I
LES	65 and above
Foreign language proficiency	Not proficient
Purpose of the student	Uncertain
Reference	Non-exist
Communication skill	Medium
Academic grade	Between 3.01- 3.50
Interviewers' student or not	Yes
Card II	Candidate II
LES	Between 55-64
Foreign language proficiency	Not proficient
Purpose of the student	Develop own qualty
Reference	Exist
Communication skill	Low
Academic grade	Between 3.51- 4.00
Interviewers' student or not	Yes

according to collected information, seven variables which may be important to selection of graduate students were defined. These seven variables were LES (Graduate Education Test like GRE) score, Proficiency of Foreign Language (POFL), the Purpose of Student (POS), whether there is any Reference (R), Communication Skill (CS), GPA (grade point average), whether s/he was a student of interviewer in undergraduate education (WIS). Then LES (65 and above, 55-64 and 45-54), CS (low, medium, high), GPA (2.50-3.00, 3.01-3.50 and 3.51-4.00), POS (uncertain, to develop own quality and, to built academic career) were categorized to three and POFL (proficient and not proficient), R (exist, non-exist), WIS (yes, no) were classified into two levels (see Table 1 for a review). Although LES, POFL, CS and GPA in fact were continuous, these variables were categorized for conjoint analysis.

In this study there are 7 factors and when their categories are considered, a wide combination (3x2x3x2x3x3x2=628) is emerged. This study utilized a fractional factorial design, under SPSS Conjoint, to reduce the number of profiles to a manageable size, while at the same time maintaining orthogonality. Since ranking such a big combination is boring for participants and hindering to get beneficial results, only 18 profiles were produced through SPSS 11.5 syntax, via collecting different levels of variables in a random way. In other words, real individuals weren't used as interviewee. After that these 18 profiles were written on 18 cards, each of which represents an interviewee and two examples of them can be seen in Table 2. Finally these cards were given to participants to rank them in pursuance of their preference and after 24 hours, cards were taken back. The preference ranks of participants were used as data of this study.

Conjoint analysis was used as a statistical method. In this analysis LES, POFL, CS, GPA were modeled linear more (namely, when their levels increased, the acceptance possibility of students would increase too) and POS, R, WIS were taken as discrete. Data were analyzed through SPSS syntax.

RESULTS

Pure and applied science: As a measure of model-data fit, the Pearson's *r* was found 0.97 ($p<0.001$) and Kendall's Tau was found 0.89 ($p<.001$). These statistics show that model-data fit were good. The results of conjoint analysis for pure and applied science were given in Table 3.

As shown in Table 3, the most important variable which affects selecting students for graduate education was POS with 24.2%. It can be seen that the maximum utility, with regard to *POS*, was provided as 2.10 in level of "to build academic career" and the minimum utility as -2.11 in level of "uncertain" for acceptance. POFL was found second important variable with 20.29%. Namely students who are proficient in foreign language are preferred to those who are not proficient. GPA was third important variable for selecting student with a percentage of 15.41%. This variable gave the utility values increasing linearly, depending on level of GPA. The maximum utility

Table 3: Importance (percentage) of the attributes and levels' utility values for selecting students to the pure and applied science

Attributes	Importance (%)	Levels	Utility
LES	15.32	Between 45-54	1.39
		Between 55-64	2.79
		65 and above	4.18
POFL	20.29	Proficient	6.48
		Not proficient	3.24
POS	24.22	Uncertain	-2.11
		To develop own quality	0.01
		To build academic career	2.1
R	7.84	Exist	-0.21
		Not exist	0.21
CS	10.84	Low	0.95
		Medium	1.91
		High	2.86
GPA	15.41	Between 2.50- 3.00	1.22
		Between 3.01- 3.50	2.45
		Between 3.51- 4.00	3.67
WIS	6.07	Yes	0.29
		No	-0.29

Table 4: Importance (percentage) of the attributes and levels' utility values for selecting students to the social science

Attributes	Importance (%)	Levels	Utility
LES	17.87	Between 45-54	1.34
		Between 55-64	2.68
		65 and above	4.02
POFL	14.37	Proficient	4.56
		Not proficient	2.28
POS	24.94	Uncertain	-2.34
		To develop own quality	0.94
		To build academic career	1.4
R	7.41	Exist	-0.24
		Nonexist	0.24
CS	13.64	Low	0.79
		Medium	1.59
		High	2.38
GPA	15.33	Between 2.50- 3.00	1.35
		Between 3.01- 3.50	2.7
		Between 3.51- 4.00	4.05
WIS	6.43	Yes	0.17
		No	-0.17

value was provided as 3.67 where the GPA was in the highest level. LES was found as fourth important variable with a percentage of 15.32%. The maximum utility value was provided as 4.18 in LES where it is "65 and above". CS was fifth with 10.84%. Also in this variable, the maximum utility value was found as 2.38 where it is in the highest level. Sixth important variable was R (with 7.84%). Although this variable was not much important it was found that students who have reference were preferred to those who have not any reference. The least important for selecting student was WIS with 6% approximately. Candidates who are interviewers' students are preferred to those who are not.

Social science: As measure of model-data fit, the Pearson's *r* coefficient was found 0.97 ($p<.01$) and the Kendall's Tau coefficient was found 0.89 ($p<.01$). This shows that model-data fit is good. The results of conjoint analysis for social science were given in Table 4.

Table 4 shows that the most important variable which affects accepting student for graduate education was determined as *POS* with 24.94%, similarly pure and applied science. The maximum utility, in POS, was provided as 1.40 in "to build academic career". LES was found as second important variable with 17.87% for accepting student. The maximum utility value was provided in the highest level of LES and the minimum utility value was provided in the lowest level. GPA can be seen as third important variable for selecting student with a percentage of 15.33%. The maximum utility value was provided in academic grade where its highest level is "3.51-4.00" and the minimum utility value was provided in academic grade where its lowest level is "2.50-3.00". POFL was found as fourth important variable, with 14.37%. The maximum utility value was provided as 4.56 where the students are proficient in foreign language. CS was the fifth with a percentage of 13.64%. The maximum utility value was determined as 2.38 where it is in the highest level and the minimum utility value was determined as 0.79 where it is in the lowest level. R was sixth important with 7.41%. From levels of this variable, the maximum utility was provided as 0.24 where students have reference. Finally, the least important for selecting student was determined as WIS. This variable was important as 5.24%. The maximum utility value was provided as 0.17% where the candidate was interviewers' student.

Overall results of pure and applied science and social science: The relative importance of each of the seven attributes is represented in Fig. 1. The percentages in Fig. 1 reflect the contribution each attribute makes to the student accaptance decision. Figure 2 shows the part-worth utility scores for each level of each attribute. Respondents overall felt that POS was the most important factor (25 percent) followed by POFL (17 percent), LES (17 percent), GPA (15 percent), CS (12 percent), R (8 percent) and finally WIS (6 percent). POS was

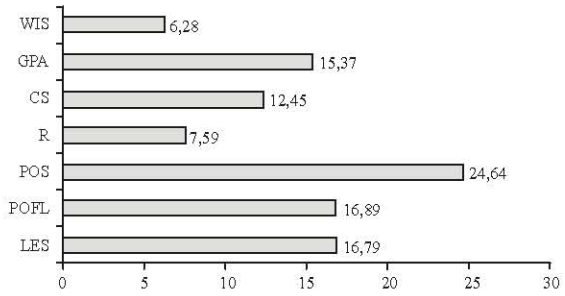

Fig. 1: Importance of attributes for total sample (%)

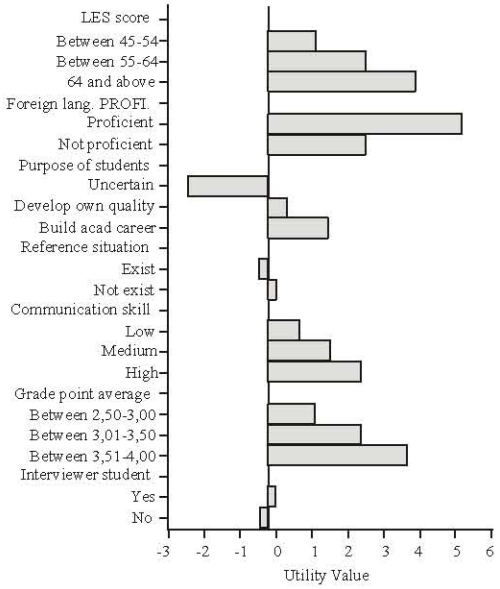

Fig. 2: Degree of influence of each attributes levels (of the seven attributes studied) on the participants' choices. High values indicate desired levels and negative values reflect undesired levels

therefore twice as important for respondents as the CS. POS, POFL and LES accounted for nearly 60% of the importance all respondents attached to the attributes of candidates. The WIS was the least-valued attribute.

Within the qualifications, the utilities of each level were also investigated. With regard to the POS, "uncertain" had a negative utility (U = -2.24), while "to develop own quality" had a higher utility (U = 0.54) and "to build academic career" had the highest utility (U = 1.7). A candidate who was proficient to foreign language had more utility (U = 5.38) than one that was not proficient to foreign language (U = 2.69). With regard to the LES, between 45-54 score had a minimum utility (U = 1.36), while between 45-54 score had a higher utility (U = 2.73) and 65 or above score had the highest utility (U = 4.1). The remaining utilities can be read from Fig. 2.

As measure of model-data fit, the Pearson's *r* coefficient and the Kendall's Tau coefficient were estimated as.98 and 0.92 ($p<0.01$), respectively. These statistics show that model-data fit were good.

DISCUSSION

The main focus of this study was to determine which variables are prior characteristics in student selection interview. Results of this study indicated that, for pure and applied science, POS was the most important variable followed by POFL, GPA, LES, CS, R and WIS. Also, POS determined the most important variable for social science followed by LES, GPA, POFL, CS, R and WIS for social science.

There was considerable variation in utility between the levels of POS. Level of to build academic career had the highest utility followed by to develop own quality and uncertain. Level of uncertain had the negative highest utility. Arvey and Faley [22] found that when interviewers got any negative impression from interviewee during interview, they perceived this more negative than what it was in real. When purpose of the student is perceived uncertain by interviewers, this can cause negative impression on them.

LES which was observed as the second most important variable for selecting student in social science decreased fourth place in pure and applied science. LES score could correspond to the variable which was named as "cognitive ability and mental ability" variable in the previous studies [13, 14]. LES score was observed more important variable in social science than it was in pure and applied science. The GPA was determined as important in the same order both social science and pure and applied science. The GPA was defined third effective for selecting student. This variable which was one of the important parts in the study was conspicuous as past experiments in the previous studies.

The POFL also defined an important variable in both institutes. This variable was second effective in pure and applied science and fourth in social science. In Turkish universities, to utilize resource written in foreign language is accepted an important issue for academicians. The CS also was observed as the fifth most important variable for selecting student in pure and applied science while it was observed as the fifth most important in social science. In the previous studies examined by Harris [12], Huffcutt, Roth and Conway [13] and Ramsay and Gallois [15] this variable was determined as an important variable. Although it was thought that the CS was more important

in social science than it was in pure and applied science, the contradiction of this condition occurred.

According to results of analysis for selecting student for graduate education in both institutes, degrees of efficiency of variables, from the most important to the least important, are POS, POFL, LES, GPA, CS, R and WIS. From the overall results, a perfect candidate for graduate education must aim academic career, be proficient at foreign language, have 65 or above LES score, have between 3.51- 4.00 GPA, have high communication skills, have reference and must be interviewer student in prior education.

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