



## Improving Academic Conferences – Criticism and Suggestions Utilizing Natural Language Processing

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**Abstract:** This study focuses on the evaluation of academic conferences and ways of improving them. The study includes a case study of one university in Israel. Sixty two academic faculty members from varied departments completed a questionnaire, including 61.7% women and 38.3% men. The research participants were asked a single open question: "What do you think could be improved at conferences?" In addition, age, seniority, and the number of times the respondents had initiated or served as a partner in initiating a conference were also examined. The main findings are as follows: Age predicts seniority. Seniority has a positive effect on the number of times the respondent organized or was a partner in organizing a conference. Seniority has a negative effect on time, i.e., the more senior the faculty member the more he or she would like conferences to be short and to the point. Moreover, the amount of initiatives to organize a conference or to be a partner in establishing a conference has a negative effect on interaction, i.e., the more initiating the faculty member the less he or she is interested in interpersonal interactions at conferences. The wish to space out sessions and lectures has a positive effect on the need to improve the quality of the lectures.

**Keywords:** *Academic conferences, natural language, ready teacher, university.*

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### Introduction

Academic conferences are a very common affair around the world and each year there are many events that address a variety of topics in many areas. These conferences are an excellent opportunity to enrich professional knowledge and at the same time to form connections with people from the same field and to promote academic collaboration.

Several previous studies, in which we examined the associations between factors that affect the academic-research achievements of faculty members (Yair, Gueta, & Davidovitch, 2017; Davidovitch, Soen, & Sinuani-Stern, 2011; Davidovitch, Sinuani-Stern & Soen, 2014), found that the higher the age of the faculty member and his or her seniority, the higher their academic output.

In this study focusing on improving conferences we hypothesized, in light of the research literature, that:

H1. *AGE* has a positive effect on *SENIORITY*.

H2. *SENIORITY* has a positive effect on *INITIATIVE*.

In addition, in psychology, perception of time is a concept intended to explain the differences between people, with regard to how they relate to the time, they have at their disposal to perform different tasks. Perception of time is affected both by personality-intrinsic characteristics and by environmental-extrinsic factors (Waller, Conte, Gibson, & Carpenter, 2001; Sanna, Parks, Chang & Carter, 2005; Teigen & Karevold, 2005).

Moreover, the research literature on work values relates to values of initiative, interpersonal relations, time, and quality (Harabi & Harpaz, 2007; Tzafirir, Baruch, & Meshoulam, 2007). Furthermore, the research literature indicates that experience leads to focusing and impatience ([http://www.leadergroup.co.il/c\\_articles/interpersonal-communication-2/](http://www.leadergroup.co.il/c_articles/interpersonal-communication-2/)).

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In light of the research findings in these fields we hypothesized that:

H3. *SENIORITY* has a negative effect on *TIME*.

H4. *INITIATIVE* has a negative effect on *INTERACTION*.

H5. *TIME* has a positive effect on *QUALITY*.

## Methodology

### *Initial Sample*

A questionnaire was used for the purpose of data collection, with one open question: "What do you think could be improved at conferences?" Another question concerned the number of times the respondent had initiated a conference or had been a partner in an initiative to organize a conference, as well as age and seniority (in years). Sixty two completed questionnaires were collected. The questionnaires were distributed online using Google Docs, to the senior faculty members of Ariel University. Ariel is the newest university in Israel with a growing number of staff faculty. The purpose of this pioneering study is to offer insights to improve conferences. Since new organizations have greater flexibility and a wider range of options (Braganza, Awazu, & Desouza, 2009), this university is most suited for this study since the faculty members may see a wider range of options, which may provide better insight for improving conferences. Respondents were from 17 different departments. Each department had several respondents, with the departments having a minimum of one respondent and a maximum of 17. Response rate was 73%. Regarding gender, 61.7% (37) of the respondents were females and 38.3% (23) males. Respondents' age ranged from 37-49 (23.1%), 50-81 (76.9%). Regarding marital status, 3.3% of the respondents were single, 88.3% married, 6.7% divorced, and 1.7% widowed. Note, these are valid percent, i.e., reducing cases where respondent did not answer the marital status question.

### *Analysis*

We used R v.3.3.3 For Structural Equation Modeling (SEM) (Eckhaus & Sheaffer, 2018a), to test the model's goodness-of-fit, and SPSS v.23 for other statistical procedures, such as correlations. Model fit was estimated using comparative fit index (CFI), Tucker-Lewis Index (TLI), and root mean square error of approximation (RMSEA), (McCoach, Gable, & Madura, 2013).  $\chi^2/df$  ratio (Hoe, 2008) was included.  $>0.9$  Cutoff values indicate acceptable fit for CFI and TLI, values  $<.06$  for RMSEA, and values  $<0.8$  for SRMR (Hu & Bentler, 1999).  $\chi^2/df$  ratio should be  $< 3$  (Akbar & Parvez, 2009).

### *Manual classification*

Initially, we manually reviewed all the respondents' answers and identified major themes, as follows. INTERACT – the need to extend and expand the possibilities to interact and communicate with other scholars. QUALITY – the need to improve the quality of the lectures. TIME – the need to provide more time in general, both for the sessions and between sessions.

### *Text analysis*

We used TEXTIMUS, a software designed for text mining and analysis (Eckhaus & Ben-Hador, 2017; Eckhaus & Davidovitch, 2018). First, we generated n-gram frequencies (Davidovitch & Eckhaus, 2018). Statistical language models are probability distributions of word sequence, where any sequence of n items (words) is called an n-gram (Rahnama, Toloo, & Zaidenberg, 2018). N-gram language models are widely used in Natural Language Processing (NLP), such as information retrieval and speech recognition (Dang et al., 2016).

The three primary branches of traditional text classification are: feature engineering, feature selection, and using machine learning algorithms (Xiao et al., 2017). For feature engineering, the Bag-of-Words (BoW) is the most popular feature used (ibid), also known as the most common method for text analysis based on NLP (Razavi, Matwin, De Koninck, & Amini, 2014). According to this technique, a vector of keywords is explored in all documents, where each keyword is assigned a value, according to whether the word appears in a document or the number of times it appears (Tian, 2017). Therefore, we analyzed the frequency of the words in the set of texts, and compiled into groups the words with the highest frequency employed for the research variables. Similar to studies that employed BoW (e.g. Eckhaus (2016, 2017, 2018)), we then summed the frequencies of the groups of words to create the variables (Ben-Hador & Eckhaus, 2018; Eckhaus & Sheaffer, 2018b; Klein & Eckhaus, 2017). Stemming was also employed for the words analyzed. Every word or phrase from the following groups were added after careful examination that the word correspond to the group from the context. Table 1 displays the list of words for each of the variables, translated from the original words in Hebrew.

Table 1. Word groups

Quality	Time	Interaction	
lecture	time	interaction	researchers' email developing connections
research quality	spaced sessions	joint leisure time	
materials quality new things More professional discussion	there is a multiplicity more depth	get together Communication add events Meet between contact list work meetings	colleagues networking outside the conference dialogues discussion acquaintance

## Results

The correlations, means, and standard deviation values of the research variables are presented in Table 2.

Table 2. Correlation matrix, means, and SD

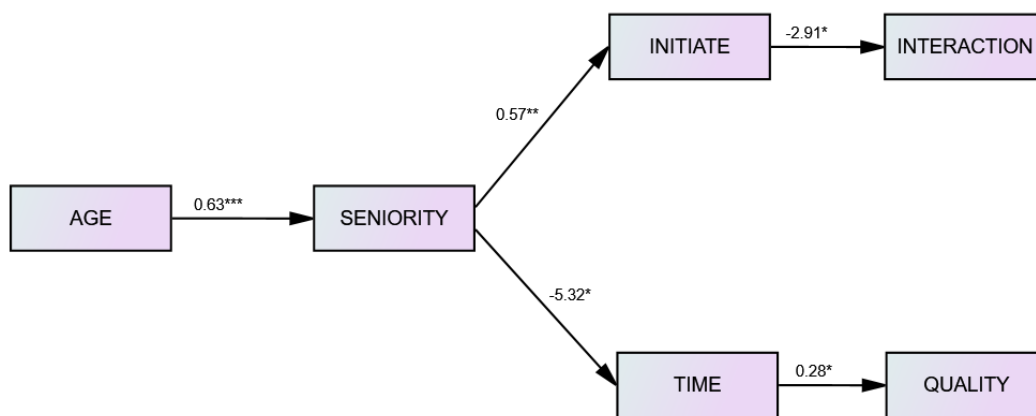
	AGE	SENIORITY	INITIATE	INTERACT	TIME	QUALITY
AGE	-					
SENIORITY	.54***	-				
INITIATE	-.02	.30*	-			
INTERACT	-.15	-.13	-.30*	-		
TIME	.09	-.26*	-.002	-.05	-	
QUALITY	-.01	-.16	-.13	-.15	.29*	-
Mean	56.98	17.86	3.44	.31	.19	.21
SD	10.76	9.15	4.82	.50	.44	.45

\* $p < .05$  \*\*\* $p < .001$

Before constructing the model, we first examined whether the departments had an effect on each of the three formulated variables, *INTERACT*, *TIME*, and *QUALITY*. Three one-way ANOVA tests were constructed, where *INTERACT*, *TIME*, and *QUALITY* were the dependent variables in each of the tests respectively, and *DEPARTMENT* was the independent variable. Results of the three tests showed no statistical significance ( $p > .05$ ). Next, we examined whether *AGE* and *SENIORITY* varies among departments. Results showed no statistical significance ( $p > .05$ ), which shows that there is balance on these key variables across departments.

Figure 1 illustrates the model and the results. The hypothesized model showed a very good fit:  $\chi^2/df = 0.04$ ,  $p > .05$ , CFI = 0.99, TLI=0.98, RMSEA = 0.03. All hypotheses were supported. *AGE* has a positive effect on *SENIORITY* (H1), which is quite intuitive. *SENIORITY* has a positive effect on *INITIATE* (H2) and a negative effect on *TIME* (H3). *INITIATE* has a negative effect on *INTERACTION* (H4), and *TIME* has a positive effect on *QUALITY* (H5).

SEM models typically require a larger N. in order to validate the findings, we have analysed the model additionally using Path Analysis, employing the same fit measures. Path Analysis have been often used with small samples to advance knowledge (Tessier, 2009). Path Analysis results showed good fit:  $\chi^2/df = 1.09$ ,  $p > .05$ , CFI = 0.97, TLI=0.93, RMSEA = 0.04.



\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Figure 1. SEM and coefficients

### Summary and Discussion

This study, focusing on the evaluation of academic conferences and ways of improving them, shows that the age of the faculty member predicts his or her seniority (H1). The model also confirms that seniority has a positive effect on the number of times the respondent organized or was a partner in the organization of conferences (H2). These two findings, although intuitive, are not obvious due to the culture involved, as in Israel many people begin an academic career at an older age (Katz, 2016). Therefore age may often have a lower role in academic seniority and conference initiation experience compared to other nations or cultures.

In addition, seniority has a negative effect on time, i.e., the more senior the faculty member the more he or she would like the conference to be short and to the point. Moreover, the amount of initiatives to organize a conference or to be a partner in establishing one has a negative effect on interactions, i.e., the more initiating the faculty member the less he or she is interested in interpersonal interactions at conferences. From this respect, these findings support the research literature on the effect of personality-intrinsic characteristics and environmental-extrinsic factors on one's perception of time.

Another interesting finding is that the wish to space out sessions and lectures has a negative effect on the need to improve the quality of the lectures. These findings suggest the need for further investigation of the relationship between time and quality of conferences lectures.

This research offers a case study, investigating the effect seniority, and expectations regarding interaction, time and quality of the conferences, as well as the effect of conference initiation experience. This pioneering research provides the grounds for many extensions, studies that will investigate the impact of these parameters in other universities, as well as the effect that different faculties and departments may have on the faculty staff, regarding the decision and selection process of conferences.

Several implications arise from the empirical model. Findings suggest that as senior faculty members invest great efforts in initiating conferences, they consider other success factors related to the conference, than the level of interaction among participants. For instance, as the model suggests, senior faculty members prefer shorter sessions, probably because of the vast experience, they do not need or have the patience for long sessions. This assumption is supported from the positive impact of age on seniority. On the other hand, faculty members that prefer larger sessions, also tend to appreciate the quality level of the lectures. That is, acquiring knowledge by the introduction of original ideas and new findings.

These findings provide valuable insights that may assist in the organization of conferences and support their success. Typical conferences are organized with a pre-determined time frame for the lectures. This study's findings suggest that providing several tracks, with a different time frame for the lectures and in-depth discussion may attract different researchers and therefore a larger audience.

This pioneering research provided empirical evidence based on a small sample. Although we have provided support for the analysis using different statistical techniques, however, the small sample may be the reason for no statistical significance between departments. Future studies that will provide support for the findings by investigating a larger N, would be valuable for the examination of the selection process of conferences and the insights that derive from it. Specifically, future studies should investigate if views on conferences vary across disciplines, as conferences differ across disciplines. The impact of academic faculties on seeking cooperation or the need for publication, may also contribute further to the understanding of the academic conferences selection process.

Furthermore, this study handed out the survey across several disciplines within one university. A valuable extension of this study would be to examine the findings based on multiple universities but within a specific discipline, which will provide in-depth insights for academic disciplines.

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