How To Enhance The Quality Of Meetings During Conferences? The analysis of syntactic and semantic parameters in direct and written communication types.

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Abstract:

The overall success in cooperative development of science and industry depends on communication quality between professionals. Transformation and innovation require constructive dialogue between people from hermetic professional environments. Professional meetings such conferences and congresses develop to be one of the most important connecting platforms to create new interdisciplinary projects and businesses. Considerable evidence suggests that how people react during first meetings strongly affects their chances for further cooperation. However, very few studies of cognitive reactions have measured syntactic and semantic parameters determining meeting quality. In this study we attempted to dissect the basic parameters of the communication, which should be considered in future standardized evaluations of conferences, workshops and professional trainings. Particularly we wondered, which factors influence plasticity of the overall effect of the meeting. Implications of these findings and avenues for future research are discussed.

Keywords: communication efficiency factor, meetings quality, comprehension, engagement, conferences

1. Introduction

The quality of dialogue between people depends on appropriate location in time and space, on communication language they use and personal communication skills. Conferences are professional meetings, which develop to be one of the most efficient platform in originating interdisciplinary projects combining scientific research with industry. Professionals have been participating in conferences for more than 450 years. They communicated using a single language to gain access to the literature and exchange knowledge and experience with other experts anywhere in the world. The common language in Europe was Latin and since the end of the Second World War, English has become the established international language of scholarly and business communication concerning writing and face to face meetings (Tardy, 2004). Conferences are also important for economy. Invited people travel, visit, sleep and eat, what increases money exchange. According to tourism statistics for 200 countries (World Tourism Organization 2006), most travel occurs between advanced industrial societies and especially within western and southern Europe and within North America.

Compared to their 16th century ancestors, modern conferences are more inclusive than they have ever been, with diverse selections of delegates and speakers from around the world. The basic format of conference meetings remained largely the same, where talks are followed by questions, with regular breaks for informal interactions. Unfortunately, the sessions after talks still offer limited opportunities for meaningful speaker-audience dialogue (Moore, 2010). Recent study revealed that informal parts of professional meetings are considered to be the most productive regarding increase of the tempo of intellectual exchange and development of ideas and collaborations (Obris, 2008; Stobbe et al., 2013). The main attraction for people is the opportunity to meet, network and make businesses, therefore conference organizers and planners facilitate such operations by improving the structure of the event and adding the time for networking and interpersonal communication (Vaggi et al., 2014).

Direct and written communication are basic tools to exchange information. Appropriate choosing of the communication type, communication channel, appropriate encoding and decoding messages and feedback - all these factors determine the quality of the meeting (SkillsYouNeed, 2014). The effectiveness of communication makes or breaks business and scientific relationships. If the key components of effective communication are missing, a meetings' productivity will decrease. According to Marquiz, the critical components for the functionality of a business and the flow of information in direct communication are: active listening, clarification of a message to prevent misunderstandings and wasted time, length of a message (the shorter and more consistent message, the better understanding), constructive criticism and detailed comments (Marquiz, 2014). Communication with erroneous details and long explanations may cause losing the meaning of the conversation by a person to whom a message is spoken.

Similarly to direct communication, there are depicted key components for the functional business writing. Cuppan described markers to measure communication quality in written documents such accuracy, clarity, compliance, consistency, brevity, grammatical correctness (McCulley/Cuppan 2009). Since these attributes of quality do not necessarily determine whether a document meets reader needs, effective set of descriptive markers was developed to help measure how well a document is communicating. These features are: clear purpose of the document, strong logic, sufficient context, adequate content, strong organization, effective presentation and clear language supporting efficient reading and proper understanding.

In both cases described above, the key components determining the quality of the direct and written communication are descriptive parameters set up empirically, which cannot give standardized value of the

meeting. Development of the standardized evaluation method for meetings quality is required to provide economic and social progress in development of new types of conference meetings and so important nowadays interdisciplinary communication between companies, institutions and governments. In this work we developed and tested a conceptual framework that delineates communication quality. The aim of this study was to depict and analyze clear to measure syntactic and semantic parameters determining conversation components.

2. Materials and Methods

84 subjects (age 18-30 years), participated voluntary in the experiment (Scheme 1). We selected students from two occupational areas: business and scientific, with humanistic approach and students of strict subjects. Individuals were divided randomly into two groups for two different types of interviews: in direct and written communication types. Before the experiment, students were informed about the plan of the testing procedure. Each volunteer subscribed the agreement for analysis and publishing data for the purpose of the realization of this project. During the simulated meetings students were video-recorded. After the interview subjects were asked to get feedback about the quality of the communication during the meeting.

2.1. Interview

The first part of the project constituted a simulation of the meeting in direct or written communication types depending on the selected group. We used interview structure to direct the information flow, to standardize tested parameters and to be able to analyze and compare results among tested people. An interviewer didn't have any contact with students before the experiment, so it was a simulation of the meeting, where people meet first time. Questions were designed to induce different activities of the tested person. 3 questions were informational, 3 motivational, 3 problem solving and 3 emotional (Table 1., original version of the interview attached in the Supplementary materials). Questions were asked or written in fixed mixed order. Tested person was video-recorded, sitting in front of the meeting's leader and answering the questions or sitting and writing answers on a paper sheet.

Informational	Motivational	Problem solving	Emotional
What is your job now?	Your actual professional goal?	What are you doing to rich this goal?	Which projects, which you have already realized made

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			you the most happy and why?
What is your last read book?	Do you realize some optional projects for pleasure?	Do you prefer to work in hierarchic or equal structure?	What are you doing in your free time?
Are you a member of some associations, sport groups, professional groups, etc?	What are your professional successes?	Do you prefer team or individual work?	Do you have any passion/hobby?

Table 1. The design of the questions for the interview.

2.2. Questionnaire

Following the simulated meeting, next task for volunteers was to make a subjective judgment concerning the quality of given answers and levels of engagement and comprehension of asked questions (the questionnaire attached in the Supplementary Materials). The quality of answers was measured in scaled values from 0 to 6.

2.3. Analysis

Video recordings were made on MacBook Pro OS X Lion v. 10.7.5. using Photo Booth software. Movies were recorded with video resolution 720x480 , 16 frames per sec, 44kHz, and analyzed in Quick Time Player. Data were analyzed in Microsoft Excel.

3. Results

3.1. Communication quality

To analyze the quality of obtained answers from tested students we first looked at the time duration of the meeting in direct and written communication types. Then we counted the number of sentences per each answer. Knowing the number of sentences and the total number of words used by a tested subject we computed a

communication efficiency factor (CEF), which we define as the number of sentences divided by total number of words multiplied by 100. Finally we looked at the sentences classification. We divided sentences regarding the number and kind of clauses in their syntactic structure. To make the analysis more clear, we only focused on three kinds of sentences: incomplete, simple, and compound.

3.1.1. The interview takes longer time for the written communication

Time duration of the meeting was computed based on the video-recordings of 26 students participated in the direct type of communication and 22 students who were asked to write the answers on the paper. Only time from the first question until the last answer was taken into account. In case of writing, we started to count time from reading the first question until end of writing the last answer. We obtained the distribution of the interview length presented below (Figure 1. up). The time duration of the direct communication was relatively shorter than in case of writing type. The average time to answer 12 questions was 5.8 min, median 5.78, while writing the answers took longer (average time 6.5 min., median 6.24 min.). Another basic parameter we tested, was a number of words used by students during the interview (Figure 1. bottom). During the face to face meetings subjects used 6.7 times more words comparing to people who answered by writing. The mean for written type of the meeting was 67 words per 12 questions and for spoken type 398 words per 12 questions. Differences in the number of words were statistically significant in T-test analysis ($p<0.01$). We also attempted to divide students for humanists and strict minded based on their educational background. Students of tourism and recreation direction were classified as humanists and wrote slightly less words in average (61), while students of physics and computer science depicted as strict minded wrote 76 in average. Based on this analysis, we did not observe differences in communication.
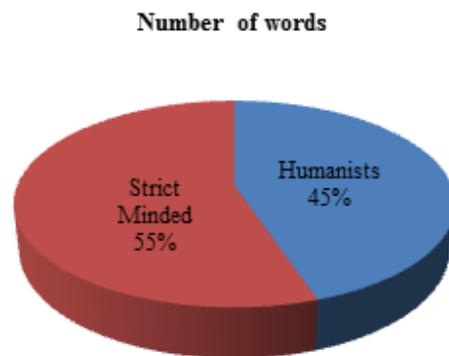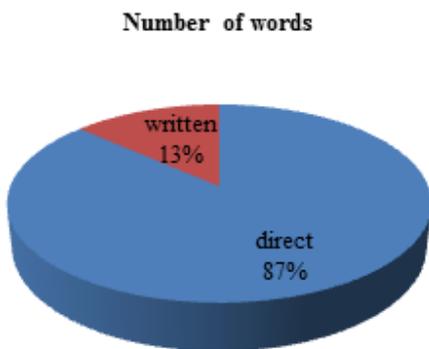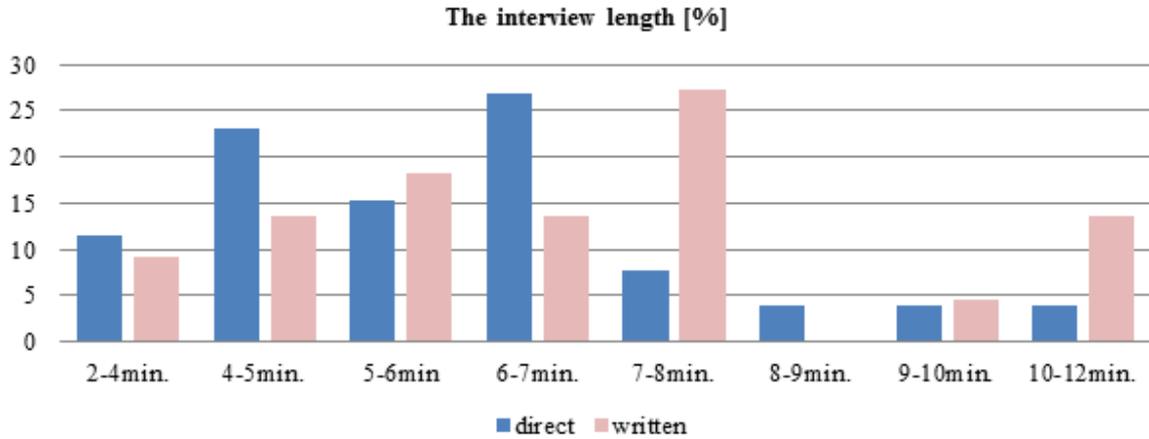
Figure 1. The interview length in relation to the number of words. Fig.1.up. The comparative distribution of the time duration during the meeting in direct and written communication types. N_d=26 - students of direct communication and N_w=22 – students of written communication. Vertical axis designates percentage ratio of tested subjects. Fig.1.bottom,left. The percentage difference between numbers of words used in verbal and written type of communication. N_d= 19, N_w=40. Statistical significance between written and direct groups: $p<0.01$ (two-tailed T-test distribution). Fig.1.bottom,right. The percentage distribution of average numbers of words written by 23 humanists with business educational background and 16 strict minded students with scientific approach.

3.1.2. Communication efficiency factor is higher in writing than in speaking.

The efficiency of communication reflects in the amount of information sent in time. In case of writing, this process takes longer time than speaking, so writing person has to think more about the quality of information to be sent. In most cases it results in higher communication efficiency. When we talk, we usually don't care about the amount of words we say, therefore the information transfer is lower. Since there is no standardized

method to compute the communication efficiency, we introduced a parameter, which we think, might be a good indicator for the quality of the conversation:

$$CEF = S_n / W_n \times 100$$

were CEF is a communication efficiency factor [%], S_n is a number of sentences and W_n is a total number of words. Assuming that each sentence carries information, the amount of information should be proportional to the number of sentences. On the other hand, too complicated sentences with multiple digressions introduce noise to the information transfer. More words in sentences disturb communication and decrease comprehension and engagement. We computed CEFs for 40 students in written type of communication and 19 students in direct meeting (Figure 2). The average CEF for written answers was 22.8% and only 5% for the direct responses. Using this method we observed 4.5 times more efficient written communication.
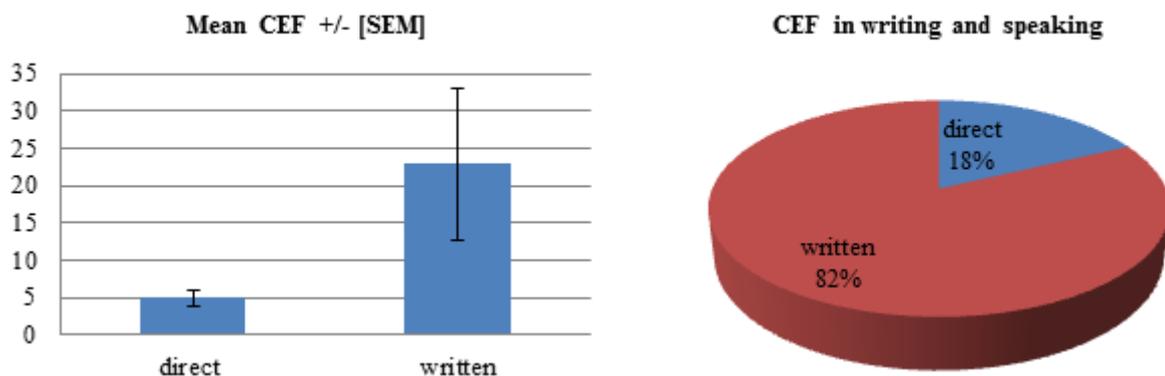

Figure 2. Communication efficiency factor in writing and speaking. Histogram presents the average CEFs in compared experimental groups with labeled standard errors of means. Plot visualizes differences between communication efficiency in two types of interviews. CEF in writing is 4.5 times higher than in direct communication. $N_d = 19$, $N_w = 40$.

3.1.3. Syntactic structure as a basic difference between written and direct communication

Counting the number of three types of sentences (incomplete, simple and compound), revealed significant structural differences in two types of communication (Figure 3.). In writing there was 67%

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predominance of incomplete sentences, while in verbal communication incomplete sentences constituted only 14%. On the other way, compound sentences were used in 59% in direct meetings while only 13% in writing. Average number of verbalized compound sentences was 12 and only 1.5 in written answers. Proportion of simple sentences was similar in two compared communication types. Reversed proportions of sentences highlighted the difference between direct and writing communication: difference in the syntactic structure of the communication types.
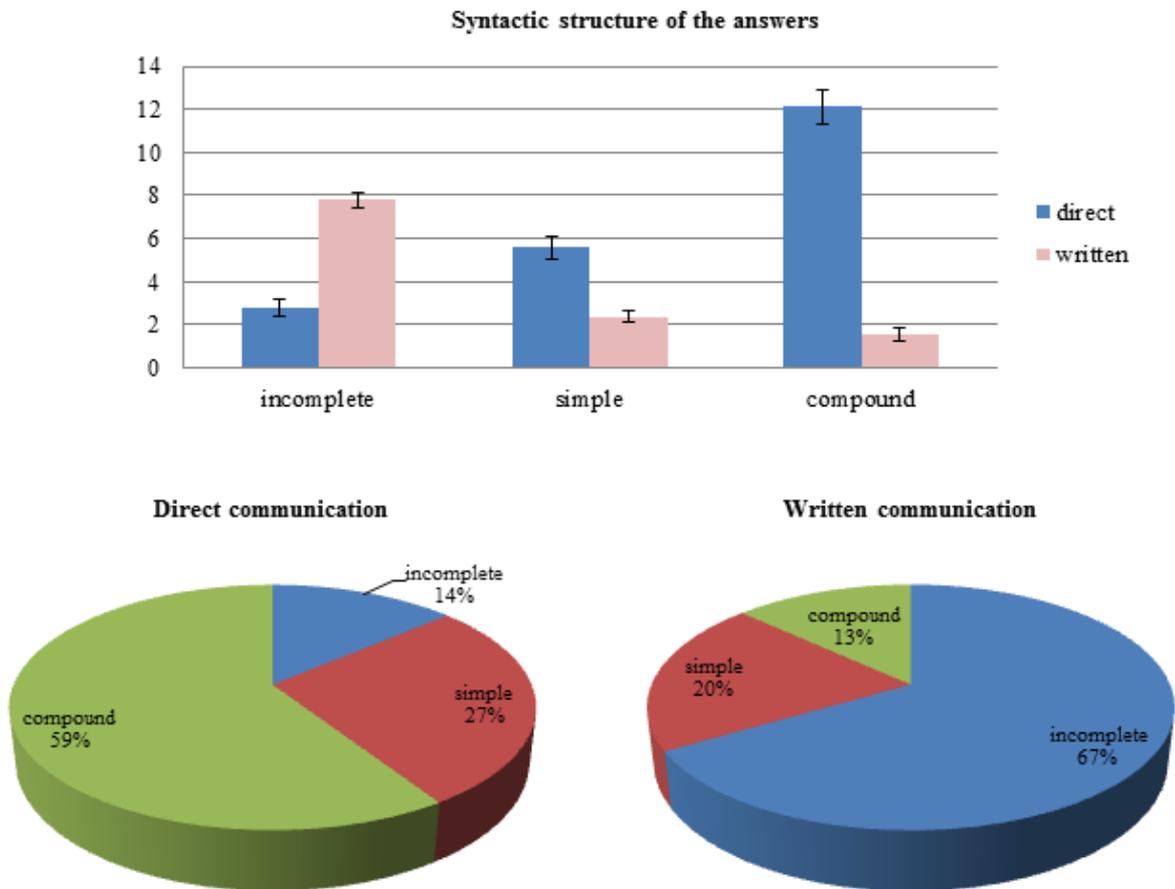

Figure 3. Syntactic structure of the answers given during the verbal and written interview. Histogram shows mean values with standard errors (SEM) for the numbers of incomplete, simple and compound sentences in direct and written communication types. $N_d = 19$, $N_w = 40$. For all cases statistical significance of T test was computed ($p < 0.01$). Differences in proportions of different classes of sentences in two types of communication are shown on the plots.

3.2.Engagement during meetings

To measure the engagement levels we tested student responses for the four different semantic groups of questions (Scheme 1., Table 1.): informative, motivational, problem solving and emotional. Informative questions were easy in structure, requiring short simple answers. Other three classes of questions required more complex operations of thinking.

3.2.1.Informative questions decrease while motivational and problem solving questions increase engagement levels during the meeting

We analyzed levels of engagement indirectly by counting the words number for different semantic groups of questions. We were particularly interested, which thematic panels of questions engage people mostly. We observed, that informative questions induced short answers formed mostly from incomplete sentences, carrying nearly pure information without additional digressions and implications (Table 2., Figure 4.).

	Informative	Motivational	Problem solving	Emotional
Direct Mean/[%]	56,1/14,5	128,6/30,9	118,1/29,9	95,6/24,6
Direct SM [%]	4,2	10,5	6,14	6,8
Written Mean/[%]	11,8/19,3	17,8/26,3	17,1/ 23,4	20,2/30,9
Written SM [%]	5,14	7,73	8,23	7,38

Table 2. Descriptive statistics of the number and percentage standarization of words in four semantic types of asked questions, in two types of communication. N_d= 10, N_w=40. SM-standard deviations of percentage values of means.

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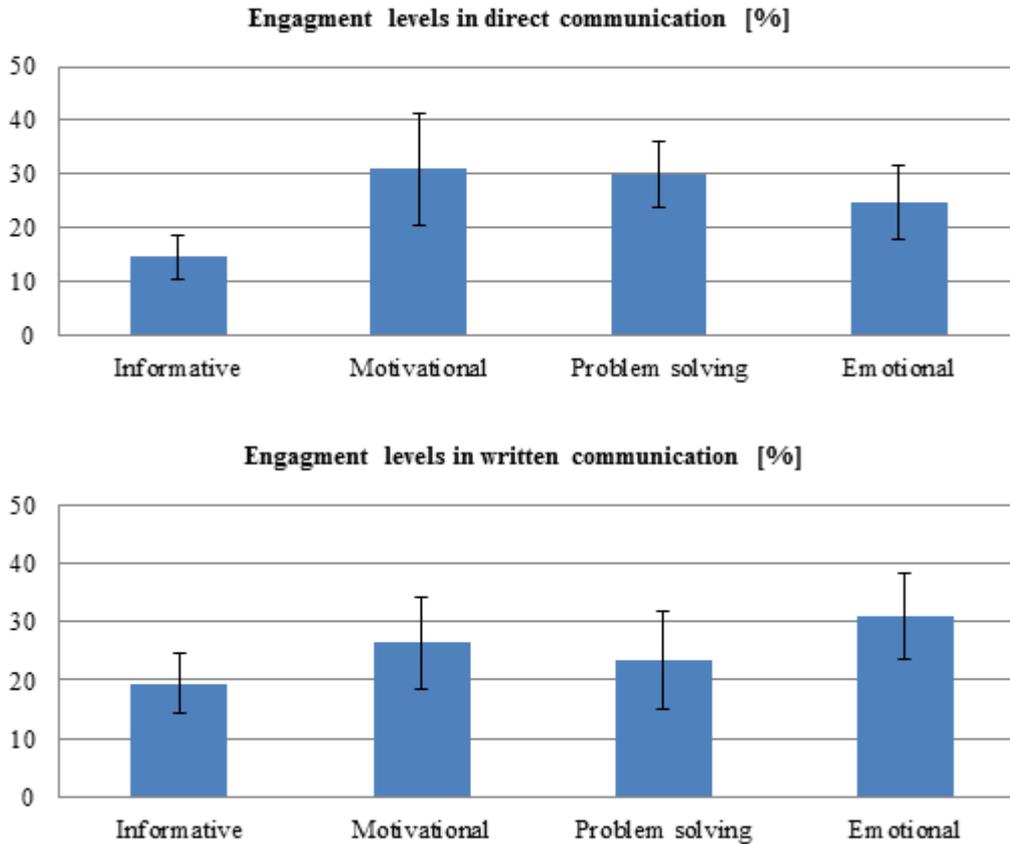
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Figure 4. Engagement levels in written communication. Percentage distribution of words number written by 39 students and spoken by 10 students to four semantic types of questions. Bars designate mean deviations.

3.2.2. Engagement levels between women and men differ more in verbal communication.

22 women and 27 men were analyzed regarding engagement levels in four semantic classes of questions (Figure 5.). Comparison of averaged word numbers in written communication between women and men did not show huge differences, when students had no direct interaction with the interviewer. The highest engagement level was observed first in emotional and secondly in motivational panel of questions. When the interaction with interviewer (a woman), was present, motivational panel induced the highest engagement levels during the meeting. Additionally, men were 7% more open than women when they were talking about their private life.

Females in direct communication

Males in direct communication

Females in writen communication

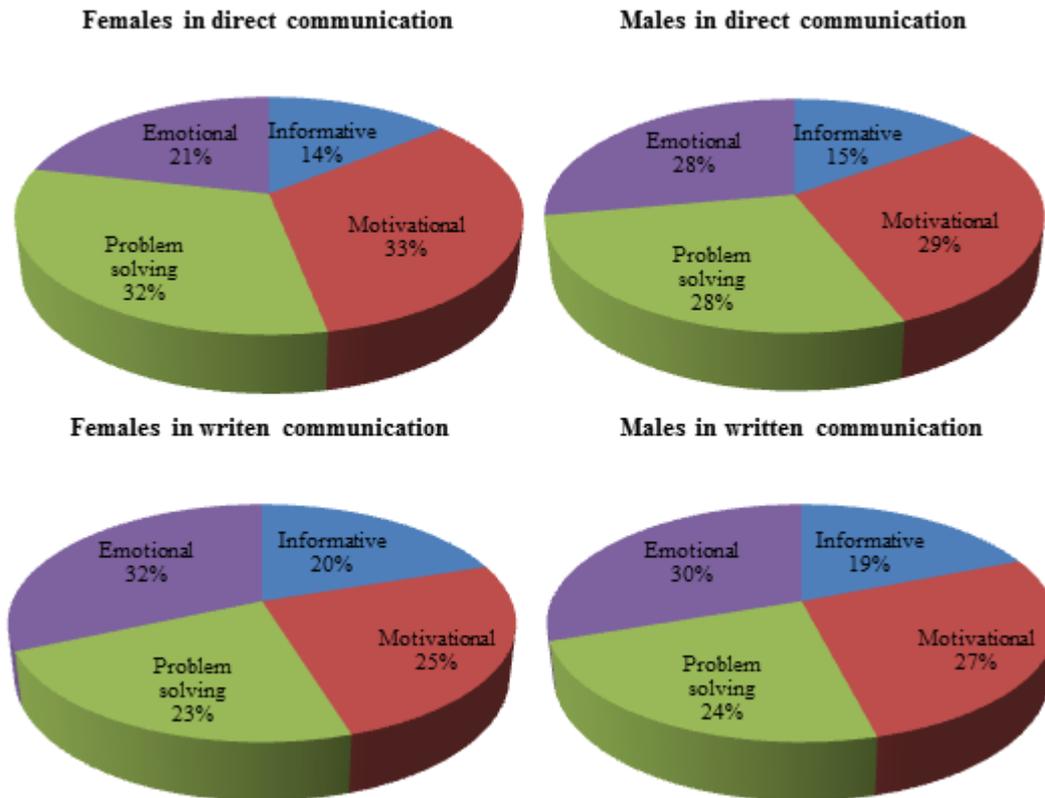**Males in written communication**

Figure 5. Percentage distribution of numbers of words in direct communication of 5 women and 5 men and in written communication of 17 women and 22 men.

3.3. Students opinions

Volunteers were asked to score the quality of given answers, personal engagement, comprehension and stress levels from the lowest value 1 up till the highest 6. Writing form of the interview was less stressful. Engagement and quality levels were scored slightly higher in the writing group than in the group participating in direct meeting (Figure 6). While women were more engaged in writing, men were more engaged in speaking. Quality of the meeting was scored higher by men than women. At the end of the experiment we asked students to tell about what kind of communication type they prefer and why. 29% women and 19.5% men prefer written type of communication because it is less stressful, there is a time to think about how to answer, and because it is documented. 71% women and 75% men prefer direct type of the meeting, because they are able to control the meeting, to observe the people participating in the communication, to clarify the message if there are misunderstandings and finally they prefer verbal communication because it gets more information.
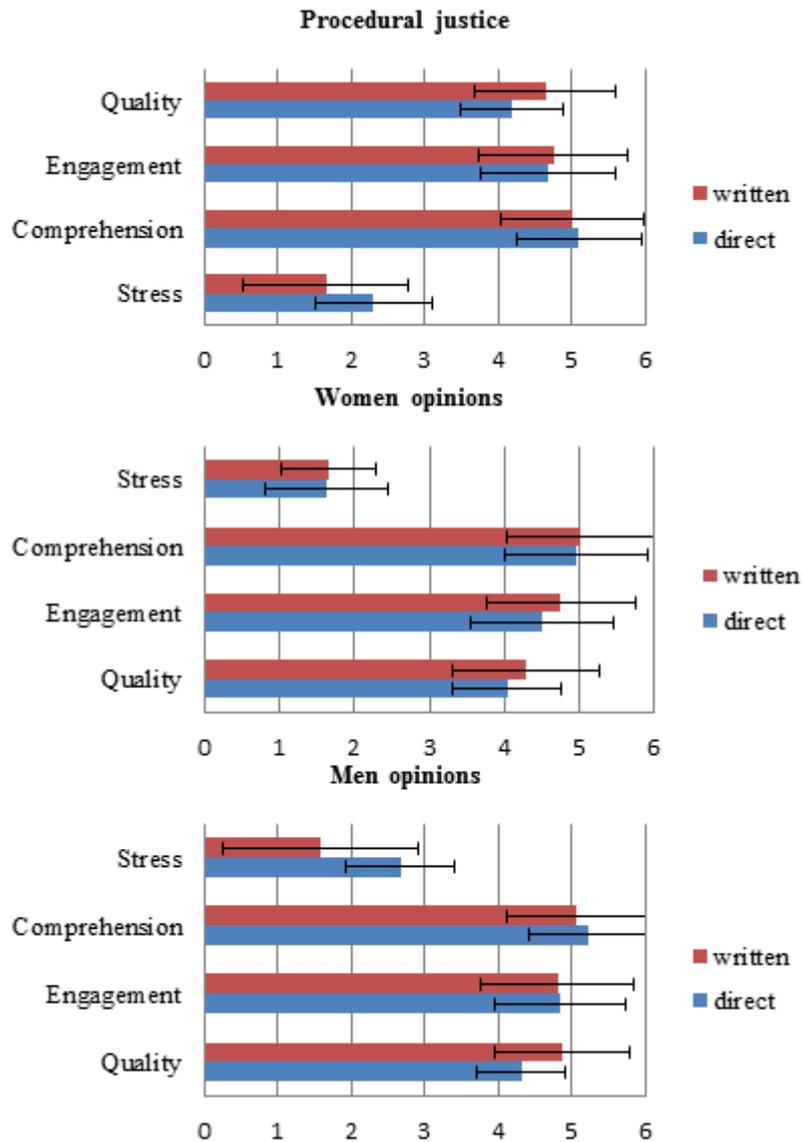
Figure 6. Opinions of students concerning selected parameters of the interview. Scoring the quality of given answers, engagement, comprehension and stress levels, is shown. Mean values of scoring and mean deviations are labelled as Y bars. $N_d = 35$, $N_w = 47$. Mean values of women scoring for $N_d = 16$, $N_w = 17$. Mean values of men scoring for $N_d = 18$, $N_w = 29$.

4. Discussion and conclusions

In this study we attempted to dissect the basic parameters of the communication, which should be considered in future standardized evaluations of conferences, workshops and professional trainings. Communication quality, engagement and comprehension seem to be crucial in building productive interpersonal interactions. We aimed to obtain numerical measurements of the meeting's determinants, because the designed meeting was an interview, based on directional asking with one side fixed, and second randomized. Using such "laboratory model" of the meeting we could focus on the analysis of single information streaming. Volunteers participating in the experiment were young students (average age 23), who behaved naturally in response to the experimental tests. This selection of young generation was important to understand natural behavioral tendencies and reactions, not masked by learned principles of diplomacy. Additionally we wanted to analyze students, how they deal with the first professional meeting, since first interactions between young and senior delegates are crucial in making business, and become predominant during the conference networking sessions. We screened all stages of the communication process: decoding the questions, encoding the answers and information flow. The quality of the meeting in written communication is higher, but time-consuming. To optimize the quality to time ratio, the best option would be to combine two methods during conversation. We approved empirical studies made by McCulley and Cuppan by showing that short communicates reflected in simple or incomplete sentences increase the information flow during the conversation and therefore rise the overall quality of the meeting.

We did not found differences in communication quality neither between humanists and strict minded people nor between people from business and scientific occupational areas. This promising message suggests, that basic communication is not disturbed by the educational background of the speakers during interdisciplinary conversations. Since we did not have large representation group of strict minded people, additional approaches and methods have to be applied to support this result.

When we consider a meeting as a knowledge exchange, we shouldn't relate this to the high quality meeting. Our results clearly shown, that the process of the knowledge exchange seems to be much less engaging than motivational and problem solving issues shared by speakers. In other words, delegates should focus on exchange opinions and advices rather than naked facts. Another factor increasing engagement and motivational levels seems to be personal attractiveness, since we observed elevated levels of engagement in direct communication between man and woman. Conversation between two women did not show engagement increase.

To conclude, we designed and verified testing procedures, which may be useful in evaluation of ROI (return of investment) in performance improvement programs for business meetings (more information about the ROI method: Phillips, 2003). Measuring the time of the meeting in direct communication is quite easy and low-cost procedure to handle. Since the time of the appointment or time of a networking session during the conference is fixed, one should only measure the time of the end of the meeting. In the summary report not only time duration should be noted. Two additional data concerning number of received information and number of shared information should be included. Such short report should be prepared already during the meeting in a way of making notes. In proposed method, making notes imposes operational thinking, and drawing conclusions already during the meeting, what increases motivation, engagement and comprehension. In written communication the evaluation of the meeting quality can be expressed by counting number of words and sentences instead of measuring time. Two other parameters should be noted similarly to the case of face to face communication.

The Meetings Industry is a sector of economy related to organizing, promoting and managing meetings, including congresses, conferences, trade shows, corporate events and incentive travels. (Celuch, 2010). The method suggested by the authors can be used especially during association meetings to follow attendees emotions and needs or during closed corporate events to check how the program changed the attitude and engagement of the employees. Event planners have not only problems with selecting the venues but also with people's involvement. Suggested method can be a source of data and constructive transformation of the interdisciplinary communication.

Communication as the act of exchanging ideas is aimed at forming a communication community, i.e. social conditions in which people can understand one another and feel needed. The combination of different approaches is crucial these days because both space and time seem to be less important than it was before. In the rapid technological development a new époque of face and cyberspace has emerged. In the cyberspace, people do not dwell within a particular place, although of course there are some markers of where users should gather, such as sites, nodes and home pages. People dwell in the spaces of movement (here today and gone a nanosecond later), and 'belong' in the conduits of travel (Urry, 2000). People have to learn how to properly use technological environment to prevent their humanity and sustain development of innovative collaborations. Communication processes change to be more advanced by using different channels. One of the most important challenge now will be development of novel types of professional meetings facilitating the new incorporation of the dialogue among delegates.

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