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A REDEFINED APPROACH TO STUDENT ASSESSMENT BASED ON ESSAY WRITING IN ESP

ABSTRACT. Fierce competitiveness of admission to highly respected universities and companies has created the need to evaluate and profile successful candidates. Traditional evaluation of candidates involving their grades is no longer satisfactory and does not provide a clear image of a candidate. There should be a way to profile a candidate and predict one's success ranging from a success in a course to a working position. Our research aimed to study potential correlations of students' writings and their revision exam grades acquired in English for Specific Purposes courses. 203 university engineering students submitted their introductory essays for the computational (LIWC) and statistical (SPSS) analysis. The results showed that the higher achievers used more scholarly vocabulary and verbose sentences. They were task-oriented thinking in a categorical way. On the other hand, the lower achievers used less complex sentences and were other-oriented, demonstrating a verbal dynamic style. However, stereotypical behaviour was only exhibited by the male students, i.e. due to societal pressure, the female students put more effort into their task completion, compensated

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for the lack of knowledge attempting to establish themselves in the male-dominated field.

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INTRODUCTION

Regardless of a field or branch of study, every university student, at some point of their studying, has to deal with producing different length and variety compositions ranging from short essays and term papers to bachelor and/or master theses. During all levels of education, students are introduced to writing techniques and styles, and instructed on how to structure their compositions. In addition to formal education, there is an abundance of online materials and advice for writing different essay types so students are provided with professional guidance on dealing with this, for numerous students, daunting task of essay writing. But what if our essays reveal more than is written in them?

THEORETICAL BACKGROUND

The ways one uses words reflect the ways of one's thinking and personal concerns. There is a growing tendency of undergraduate and professional study programmes requiring admission essays irrespective of a candidate's future field of study (Ferguson, Sanders, O'Hehir and James, 2000; GlenMaye and Oakes, 2002; Walfish and Moreira, 2005; Rabow, Wrubel and Rachel, 2009; Turner and Nicholson, 2011). Similarly, in addition to CVs, which are only informative of a prospective employee's education and work background but not of his personality, numerous employers require job applicants to submit short written statements on their background and future aspirations and use them to evaluate candidates (Hamel, 2011). The reason for the above mentioned is that management and admission boards as well as employers want to get a brief glimpse into their potential students and employees (Atkinson, 2001). The underlying idea of admission essays and personal statements is that by writing about their background, interests, experiences, and future plans, candidates demonstrate their writing abilities but also reveal their emotional states and personal concerns which are more thought-provoking and informative for admission board management and employers. Since interviews are challenging and time-consuming, submission of self-introductory essays is an excel-

lent opportunity for candidates to present their academic training, work experience, skills and ambitions (Brown, 2004; Rabow et al., 2009), i.e. it is also an opportunity for university management and employers to evaluate candidates and make wise decisions.

Traditionally, numerous studies examining the issue of successful essay writing employed top-down approaches, usually a linear modelling approach, focusing on predetermined characteristics to evaluate essays (Attali and Burstein, 2006; McNamara, Crossley and Roscoe, 2013). To put it differently, top-down approaches assume that there is a unique definition of successful writing based on predefined patterns such as a structure, clear line of content development, lexical sophistication and cohesion. However, since, according to Kellogg and Whiteford (2009), writing skills can be trained, traditional evaluation of essays performed by a human evaluator, which is time-consuming and arguably subjective, is not appropriate anymore. Therefore, more recent studies adopt automated essay scoring and evaluation (Elliot, 2003; Burstein, Marcu and Knight 2003; Burstein, Chodorow and Leacock, 2004; Deane, 2013). The purpose of such tools is to ease the instructor's load of essay evaluation, recognise errors, and provide diagnostic feedback. However, in spite of their admirable features and assistance in essay assessment, they still focus on a students' knowledge level and the ways they structure sentences. The current labour market and competitive universities require more than that.

That being said, more recent studies (Nisbett, Peng, Choi and Norenzayan, 2001; Jarvis, Grant, Bikowski and Ferris, 2003; Graesser, McNamara, Louwerse and Cai, 2004; Crossley and McNamara, 2012; Robinson, Navea and Ickes, 2013; Pennebaker, Chung, Frazee, Lavergne, and Beaver, 2014) focus on profiling candidates based on their writings. Concentrating on the syntactical level, Haswell (2000) found that advanced writers constructed more complex clauses and sentences. McNamara, Louwerse, McCarthy and Graesser (2010) and Crossley, Weston, McLain Sullivan and McNamara (2011) reported that more advanced students used syntactically complex sentences, measured by the number of modifiers in a noun phrase, and fewer base verb forms. Furthermore, Robinson et al. (2013) and Pennebaker et al. (2014) revealed that high-achieving students used more scholarly vocabulary, articles and concrete nouns defining them as categorical thinkers who concentrate on objects and things. On the other hand, focusing on actions and changes initiated by themselves or other people, low-achieving stu-

dents used more pronouns and verbs thus getting the label of dynamic thinkers. However, the authors did not claim that categorical thinkers are smarter than dynamic ones; they are just rewarded with higher grades because educational systems are set up to reward students for their understanding of the world in a categorical way. Several research studies found the correlation of positive emotion words and supervisors' ratings of students' performance. Positive emotions are not solely markers of one's satisfaction; they rather prompt the individual to pursue a wider range of aims and activities, which contribute to rating such an ambitious individual higher (Fredrickson, 2001). The other reason why the use of positive emotions is rated high is that positive emotions foster the feelings of empathy and supportive relationships with others employers are looking for in potential employees (Waugh and Fredrickson, 2006). Other indicative categories are insight words (acknowledge, reason, presume, comprehend, etc.) which are proven to be powerful markers of cognitive event processing (Pennebaker and Chung, 2007), the first person plural pronoun *we* and its related forms whose usage indicates feelings of belonging and affiliation (Chung and Pennebaker, 2007), auxiliary verbs associated with a narrative style (Jurafsky, Ranganath and McFarland, 2009; Robinson et al., 2013) and prepositions and conjunctions as indicators of cognitive complexity (Pennebaker and King, 1999). A growing body of recent research points to a new direction of taking a holistic approach which places an emphasis on well-roundness of an applicant or a student and his/her contribution to a community beyond just academic performance.

METHODOLOGY

The participants were undergraduate students studying at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek. As an English for Specific Purposes class assignment, the students were asked to submit a brief written self-introduction essay. Out of 397 students studying at different levels of ESP courses, 206 students (52%) submitted their essays. The measure of two revision exams was available for 203 students, i.e. 169 male (83.3%) and 34 (16.7%) female students participated in the research. The uneven distribution of the male and female students corresponds to the percentage of male and female students enrolled in the Faculty. Breaking down our sample into more spe-

cific groups, as illustrated in Figure 1, it is clear that our sample is diverse and covers all branches offered to be studied at the Faculty. Our final sample consists of 14 male and 6 female power engineering (university study programme) students, 9 male and 7 female communications and informatics students, 99 male and 15 female computer engineering students, 9 male power engineering (professional study programme) students, 8 automation students and 30 male and 6 female informatics students.
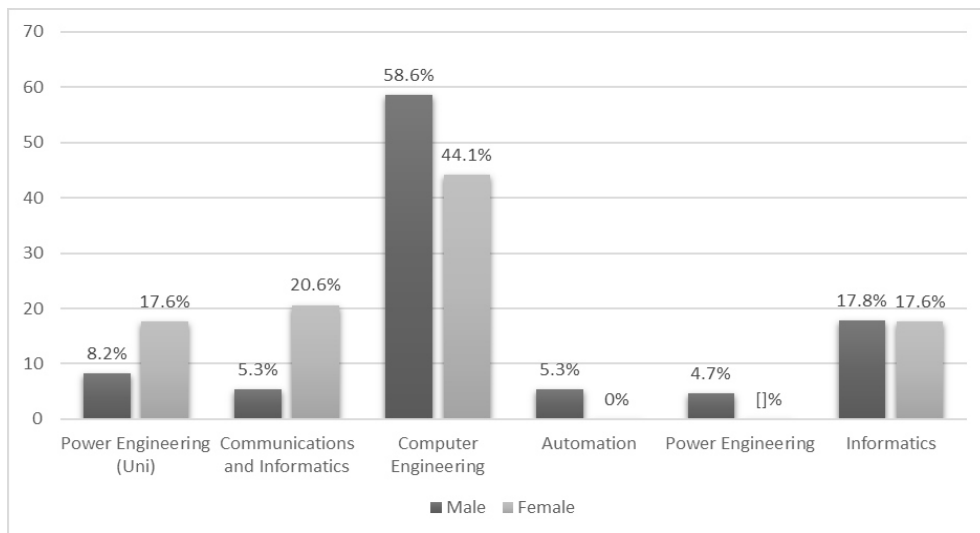

FIGURE 1. DISTRIBUTION OF PARTICIPANTS ACCORDING
TO THE BRANCH THEY STUDY AT AND THEIR GENDER

The distribution of students with respect to the branch they study at is uneven since the majority of our participants were Computer Engineering students. Even though all students were equally extrinsically motivated by earning extra points, it is evident that the Computer Engineering students were also intrinsically motivated to participate in our research and receive a feedback on their/our results.

During the academic years 2015/2016 and 2016/2017, students were asked to write a 200–250 word self-introduction essay. The data were collected from the students attending ESP (English Language I, II and III) courses in consecutive semesters to obtain a large enough representative sample. Once collected, each essay was scanned for spelling errors, corrected and technically prepared for the analysis done by the *Linguistic Inquiry and Word Count* software

(hereinafter LIWC). The essays were not graded because that was not their purpose, i.e. the essays were used as a corpus for the computational analysis with LIWC. The software has an internal dictionary of 4,500 words and word stems which were (re)categorized by a panel of expert judges in four rating stages. When one uploads a document, the software analyzes one word at a time, compares it to the internal dictionary and categorizes the word in preset categories, i.e. a word can be placed in several categories (e.g. *sad* would be put in the category of negative emotions and adjective). The categories range from linguistic (different pronoun types, verbs, articles, adverbs, etc.) and psychological (words elated to emotions) to punctuation marks and current concerns (words related to work, money, leisure, etc.). For more detailed explanation, check Pennebaker, Chung, Ireland, Gonzales and Booth (2007). Upon computational analysis, the raw data, provided as decimal numbers which are useless unless they are further processed, were uploaded in the software for statistical analysis SPSS where the variables of the students' gender, branch of studying and revision exam results were added. Revision exams were conducted twice during a semester. Students' knowledge on different grammatical units and vocabulary studied during a semester was tested in revision exams whose exercises ranged from gap filling and correcting mistakes to paraphrasing sentences and vocabulary contextual usage.

Given the nature of the LIWC variables, an uneven number of the male and female students as well as an uneven number of the branch representatives, we opted for nonparametric tests. In addition to a descriptive statistics test, we performed the Mann-Whitney, Kruskal-Wallis and Spearman correlation tests.

The following research questions were addressed:

1) Which LIWC variables correlate with the students' revision exam results?

2) Are there any branch differences?

3) Are there any gender differences?

In the following sections, a comparison of our research results and similar research was provided. We believe that this way of structuring the paper, rather than providing previous research results in the *Theoretical background* chapter, is more efficient and easier to follow. Carrying out the research and addressing the research questions, we aim to examine the potential correlations of

students' writing expression and grades/knowledge which might eventually have a recruitment potential, i.e. based on a candidate's writing and our research results, higher education institution and employing management might predict the success of their future students and/or employees.

RESULTS AND DISCUSSION

The results will be categorised into several LIWC categories (descriptor categories, linguistic dimensions, personal concerns and punctuation categories). Each selected subcategory will be elaborated on using students as a homogenous group after which it will be broken down to branch and gender because we find this way of structuring more efficient for readers.

DESCRIPTOR CATEGORIES

The selected LIWC descriptor subcategories include words per sentence and six-letter words which will be elaborated on in their respective subchapters.

WORDS PER SENTENCE

In order to examine if there are any differences in using long sentences, we performed the Kruskal-Wallis test whose results, reported in Table 1, point to a statistically significant difference (p = .003).

	REVISION EXAM GRADE	N	MEAN RANK
WORDS PER SENTENCE	Sufficient	38	80.24
	Good	63	99.02
	Very good	75	102.77
	Excellent	27	137.46
	Total	203	

TABLE 1: RELATIONSHIP OF WORDS PER SENTENCE AND REVISION EXAM GRADES

As is clear from the mean ranks, the length of the students' sentences corresponds to their revision exam grades. The best students who received excellent grades in the revision exams used the longest while the poorest students who received sufficient grades

used the shortest sentences to introduce themselves. This result is rather expected because students who have sound knowledge of English can compose more complex sentences. Also, more complex sentences can be indicative of the detailed elaboration of arguments and providing examples as well as the usage of transitional phrases which contribute to the cohesion of the text. This finding corroborates similar research results (Crossley and McNamara, 2010; Crossley and McNamara, 2011; Crossley & McNamara, 2012; Varner, Roscoe and McNamara, 2013; Crossley, Roscoe and McNamara, 2014) using expert judges whose ratings on high-achieving students were based on essay elaboration, organisation and skilful usage of cohesive features. Additionally, one unexpected finding was recorded with the Spearman correlation test. Those students, graded with sufficient grades, who used longer sentences also used more complex vocabulary [r_s (38) = .336, p = .039] and depersonalised their essays by using the pronoun *I* and the related forms at a very low rate [r_s (38) = -.327, p = .045]. They might have perceived the self-introductory essays as a formal type of writing which is characterised by longer sentences, more complex vocabulary and a general way of expressing ideas.

Furthermore, when breaking the sample down into the branches, we recorded a statistically significant difference among the Computer Engineering students. While the mean ranks of the students who received good (M = 57.30) and very good (M = 57.74) grades were almost identical, the difference was recorded for the students who received sufficient (M = 37.24) and excellent (M = 73.67) grades. The higher achievers used a higher proportion of more complex sentences (p = .010) compared to the lower achievers, which is rather expected.

Additionally, we searched for potential gender differences in the correlation to the revision exam grades and sentence complexity. The female students (M = 116.12) used longer sentences than their male colleagues (M = 99.16); however, the difference was not statistically significant (p = .125). Similarly to the Computer Engineering student results, while there were no differences between the male students who achieved good (M = 84.27) and very good (M = 86.62) grades, the male students who achieved sufficient (M = 70.47) grades used simpler and shorter sentences significantly more (p = .035) than the students who achieved excellent (M = 113.50) grades. An interesting finding from our study was that the previously reported result was not recorded for the female students. The

mean ranks of good (M = 16.50), very good (M = 16.38) and excellent (M = 22.09) grades the female students achieved point to a lack of statistically significant difference (p = .150). To paraphrase, there is no significant difference in the use of complex sentences between the female students who achieved good, very good and excellent grades. A possible explanation for this might be found in societal pressure women are exposed to. Pressurised by the society, women use more prestigious standardised linguistic forms. Regardless of their actual knowledge level and English language skills, it seems possible that the female students put more effort into writing the self-introduction essay; made a first draft, used various resources (e.g. online dictionaries), self-reviewed essays and submitted the final improved version. Our hypothesis corresponds to the one reported in a recent similar study done by Božić Lenard, Ferčec and Liermann-Zeljak (2018). They discovered that, due to societal pressure and the need to prove their expertise in the male-dominated field of technical sciences, female students did not make choices but studied both grammar and technical vocabulary while male students opted for vocabulary at the expense of mastering their grammatical skills. Female students felt that they had to strive to become proficient in both categories whereas male students did not feel that pressure.

SIX-LETTER WORDS

Like the category of words per sentence, six-letter words point to the complexity of one's linguistic expression. Carrying out the Kruskal-Wallis test, we recorded a statistically significant difference (p = .012) between the students' revision exam grades and the use of six or more letter words. While there were no significant differences between the students who received good (M = 105.98) and very good (M = 97.01) grades, the students who received sufficient (M = 84.45) grades used shorter and thus less complex words (p = .023) compared to the students who received excellent (M = 131.28) grades, which was expected. Higher achievers have a richer vocabulary which is usually composed of more complex and scholarly words. Such lexical items are frequently less common, abstract and more sophisticated thus pointing to wider lexical and consequently broader language knowledge. This result is in accord with previous research done by McNamara et al. (2010), Crossley & McNamara (2011) and Varner et al. (2013) whose research showed

that teachers rate those students who use complex words higher than students who use common and short words. Carrying out the Spearman correlation test, we noticed that when using more complex and scholarly vocabulary, the students wrote about work-related topics [r_s (203) = .499, p = .000], i.e. complex vocabulary was not used when the students described their leisure activities [r_s (203) = -.189, p = .007].

Our further analysis on potential differences regarding the branch of studying confirmed the previously mentioned result. A statistically significant difference was recorded only for the Computer Engineering students, i.e. the Computer Engineering students who achieved excellent (M = 74.98) grades used complex words significantly more (p = .032) than their colleagues who achieved sufficient (M = 42.82) grades. The fact that there were no intragroup differences for other branches might point to similarities in the knowledge levels. Also, there were no significant intergroup differences.

As was the case with our words per sentence results, we were able to record gender differences. Even though there were no significant differences (p = .614) between the male and female students' usage of long words and revision exam results, we did find intragroup differences as presented in Table 2.

Gender	Category	Revision exam grades	N	Mean rank
Male	Six-letter words	Sufficient	35	70.04
		Good	59	88.57
		Very good	59	82.64
		Excellent	16	113.28
		Total	169	
Female	Six-letter words	Sufficient	3	16.00
		Good	4	18.00
		Very good	16	15.38
		Excellent	11	20.82
		Total	34	

Table 2: Six-letter words with respect to grades and gender

Dragana Božić Lenard, Yvonne Liermann-Zeljak, Ivanka Ferčec

The mean ranks from Table 2 illustrate that the male students who received sufficient grades used significantly less (p = .043) complex words than their colleagues graded with excellent grades. On the other hand, no such differences were found for the female students (p = .567). Moreover, the female students who obtained sufficient and good grades used more complex words than their colleagues with very good grades; however, the difference was not statistically significant. This finding further supports our hypothesis that female students devote more time and effort to their assignments and achieve good results irrespective of their grades.

LINGUISTIC DIMENSIONS

The LIWC linguistic dimensions consist of all personal pronouns individually, verbs, auxiliary verbs, tenses, adverbs, conjunctions, etc. However, we will only elaborate on those categories whose results happened to be significantly different for our participants.

PERSONAL PRONOUNS

In spite of being short and usually imperceptible words, pronouns can reveal a lot about the way people perceive and approach things. In an extensive computerised text analysis, Pennebaker et al. (2014) analysed over 50,000 college admission essays submitted by more than 25,000 students. They found that the use of personal pronouns negatively correlates with students' GPA, i.e. the more students use personal pronouns, the lower their GPA is, which confirmed Robinson et al.'s (2013) study.

The Kruskal-Wallis results from our research confirmed Robinson et al.'s (2013) and Pennebaker et al.'s (2014) results. The students who obtained sufficient (M = 123.28) grades used personal pronouns more frequently than the students who obtained very good (M = 97.14, p = .041) and excellent (M = 84.33, p = .012) grades. Pronouns are, by definition, very social words. The use of personal pronouns indicates that a writer/speaker is aware of and thinks about other human beings. As noted by Pennebaker (2013), people whose count of pronouns is high have a dynamic thinking style which is associated with describing actions and changes. That being said, the low-achieving students from our study, who used personal pronouns significantly more than the high-achieving students, are probably dynamic thinkers. Furthermore, if we adopt the

hypothesis that the use of pronouns indicates that one thinks about other human beings, it seems reasonable to search for potential correlations. The Spearman correlation test results showed that when using pronouns and being other-oriented, the students were more tentative [r_s (203) = .185, p = .008] and used significantly less complex words [r_s (203) = -.516, p = .000]. It is possible that when writing about other people (probably their friends and family), students become more emotional thus becoming less certain and eloquent.

While there were no significant differences for the university Power Engineering (p = .136), Communications and Informatics (p = .307), professional Power Engineering (p = .212), Automation (p = .499) and Informatics (p = .447) students, we did record a significant difference for the Computer Engineering students (p = .001). More specifically, the students who obtained sufficient (M = 81.09) grades used personal pronouns significantly more than the students who obtained very good (M = 51.14, p = .005) and excellent (M = 42.83, p = .001) grades.

Consistent with our previous results are the ones presented in Table 3.

Gender	Category	Revision exam grades	N	Mean rank
Male	Personal pronouns	Sufficient	35	107.33
		Good	59	86.40
		Very good	59	75.54
		Excellent	16	65.88
		Total	169	
Female	Personal pronouns	Sufficient	3	13.00
		Good	4	18.25
		Very good	16	20.34
		Excellent	11	14.32
		Total	34	

TABLE 3: PERSONAL PRONOUNS WITH RESPECT TO GRADES AND GENDER

The male students who received sufficient grades used significantly more personal pronouns than the students who received very good and excellent grades (p = .003 and p = .011, respectively).

On the other hand, the female students' usage of personal pronouns did not correlate with their revision exam results (p = .385). Moreover, the students who were awarded sufficient grades used personal pronouns the least, while the students who received very good grades used them the most. So, if we adopt the hypothesis that the usage of personal pronouns is associated with referring to other people, we can conclude that this does not apply to the female students from our study, i.e. they might have focused on presenting themselves in their self-introductory essays without paying too much attention to other people.

PRONOUN HE/SHE

The social nature of personal pronouns is especially related to the pronoun *he/she* whose usage indeed indicates that one thinks and talks about other human beings (Pennebaker, 2013). It can be expected that the correlation of personal pronouns and lower grades will be extended to the correlation of the pronoun *he/she* and lower grades. The Kruskal-Wallis exam results confirmed our expectations. The students who obtained sufficient (M = 123.46) grades used the pronoun *he/she* significantly more than the students who obtained very good (M = 99.93, p = .041) and excellent (M = 91.46, p = .012) grades. To paraphrase, the low-achieving students talked about other people more frequently than high-achieving students which is in agreement with recent Robinson et al.'s (2013) and Pennebaker et al.'s (2014) studies.

Consistent with our results on personal pronouns, the Computer Engineering students who received sufficient (M = 78.29) grades used the pronoun *he/she* significantly more than the students who received very good (M = 56.83, p = .005) and excellent (M = 50.29, p = .001) grades. Surprisingly, the university undergraduate Power Engineering students who received sufficient (M = 9.50) grades used the pronoun *he/she* less frequently than the students who received excellent (M = 19.00, p = .039) grades. However, there is a great possibility that the latter result was skewed because of the small sample size (N = 2, N = 1, respectively).

Even though we were unable to demonstrate intergroup differences (p = .637), given the previously reported results, we expect to find intragroup gender differences. The male high-achieving students who obtained very good (M = 81.59, p = .011) and excellent (M = 76.09, p = .003) grades used the pronoun *he/she* less frequently

than the students who received sufficient (M = 103.34) grades. However, no such differences were found for the female students (p = .603). The significant negative correlations revealed that when the male students wrote about other people, they used fewer complex words [r_s (169) = -.158, p = .040]. Similarly, the female students composed shorter sentences [r_s (34) = -.409, p = .016]. These findings suggest that both the male and female students became less formal when mentioning their, presumably, loved ones in their essays.

One unanticipated finding was the number of mentioned male (he) and female (she) persons. We recorded 42 occurrences of the pronoun *he* and only 6 occurrences of the pronoun *she* so we can conclude that men are given more attention, which supports Božić Lenard's (2016) research on political speeches. Another interesting finding is that all 6 mentions of female persons were found in the male students' essays, i.e. the female students did not think or write about other female persons.

ARTICLES

One might perceive the study of articles pointless since they are governed by rules, which makes their usage mandatory. Articles are parts of speech whose function is to identify a noun. Their association with nouns is the reason for studying article distribution because nouns and, consequently, articles display one's ability to categorise things.

According to the Kruskal-Wallis test results, the students who were awarded sufficient (M = 83.53), good (M = 93.67), very good (M = 111.39) and excellent (M = 117.31) grades differed in their article usage, i.e. the low-achieving students used fewer articles (p = .028) than the high-achieving students, which corroborates Robinson et al.'s (2013) and Pennebaker et al.'s (2014) results. As opposed to the high use of pronouns and a dynamic thinking style, the high use of nouns and articles are indications of a categorical style. To paraphrase, the low-achieving students from our study have a dynamic thinking style, which is more involved, while the high-achieving students have a categorical informational thinking style, which is consistent with the data obtained by Nisbett et al. (2001) and Heylighen and Dewaele (2002). Not surprisingly, by using the Spearman correlation test, we recorded a negative correlation of the articles and pronouns usage. However, the correlation was not recorded for all students. Namely, the students who received

sufficient [r_s (38) = -.229, p = .001] and excellent [r_s (27) = -.340, p = .038] grades can be categorised as dynamic (low-achieving) and categorical (high-achieving) thinkers whereas the difference between the students who obtained good [r_s (63) = -.119, p = .357] and very good [r_s (75) = -.158, p = .177] grades is not that clear-cut, which is in line with our previous results.

Furthermore, comparable to our previous results, the Computer Engineering students who got sufficient (M = 33.71) grades used significantly less articles than the students graded with very good (M = 65.05, p = .007) and excellent (M = 67.50, p = .002) grades. As expected, intragroup gender differences were recorded with the Kruskal-Wallis test. The male students graded with very good (M = 99.33) and excellent (M = 97.16) grades used a higher proportion of articles than the students graded with sufficient (M = 66.39, p = .020, p = .045, respectively) grades. On the other hand, even though the difference was not statistically significant (p = .195), the female students who obtained good (M = 17.88) grades used more articles than the students who obtained very good (M = 13.78) grades, which supports our hypothesis that female students put more effort into their tasks, in this case, writing self-introductory essays.

PERSONAL CONCERNS

The personal concerns category is composed of words related to the subcategories of work, achievement, leisure, home, money, religion and death. In the following subchapters, we will elaborate on the subcategories whose results happened to be significantly different for our participants, i.e. we will examine what concerns our participants and how it is related to their revision exam grades.

ACHIEVEMENT

The subcategory of achievement includes lexical words related to the notion of achievement (e.g. acquir*, challeng*, master*, organis*, practice*, proficien*, skill*, etc.). Conducting the Kruskal-Wallis test, we recorded an interesting finding presented in Table 4.

	REVISION EXAM GRADE	N	MEAN RANK
ACHIEVEMENT	Sufficient	38	101.32
	Good	63	114.29
	Very good	75	102.83
	Excellent	27	72.00
	Total	203	

TABLE 4: RELATIONSHIP OF ACHIEVEMENT-RELATED VOCABULARY AND REVISION EXAM GRADES

As is clear from the mean ranks, the students who obtained good grades wrote about achievement the most. Moreover, they wrote about achievement significantly more (p = .039) than the students who obtained excellent grades. It seems possible that the high achievers are aware of their success and do not feel the need to emphasise it. On the other hand, the students who obtained good grades are considered as neither low nor high achievers so by striving to become better, they emphasise the obvious importance achievement has for them. A strong positive correlation, calculated by the Spearman correlation test, revealed that the students associated achievement with work [r_s (203) = .191, p = .006]. To put it differently, a strong negative correlation pointed out that the students did not associate or write about their leisure time (hobby) activities in terms of achievement [r_s (203) = -.205, p = .003]. The above applies to the entire group of our participants since we were unable to find significant inter- or intrabranch differences.

Further, Table 5 presents the Kruskal-Wallis test results on the use of achievement-related vocabulary with regard to gender and revision exam grades.

GENDER	CATEGORY	REVISION EXAM GRADES	N	MEAN RANK
MALE	ACHIEVEMENT	Sufficient	35	81.47
		Good	59	94.01
		Very good	59	85.47
		Excellent	16	57.78
		Total	169	

TABLE 5: ACHIEVEMENT-RELATED VOCABULARY WITH RESPECT TO GRADES AND GENDER

DRAGANA BOŽIĆ LENARD, YVONNE LIERMANN-ZELJAK, IVANKA FERČEC

		Sufficient	3	22.67
Female	Achievement	Good	4	22.25
		Very good	16	17.72
		Excellent	11	14.05
		Total	34	

TABLE 5: ACHIEVEMENT-RELATED VOCABULARY WITH RESPECT TO GRADES AND GENDER

Even though there were neither statistically significant (p = .705) differences between the male and female students nor intragroup differences (p = .778 for the males and p = .101 for the females), the mean ranks for the female students corroborate our hypothesis that the lower-achieving female students are more concerned about achievement and ensuring success.

LEISURE

The internal LIWC leisure dictionary includes words related to different activities done in spare time (Nintendo*, football*, party*, ski*) or things one does to enjoy oneself (tequila, tv*, mall*, karaoke*). Given the nature of self-introductory essays, we did expect that the students will present themselves through their leisure activities. The Kruskal-Wallis test results are presented in Table 6.

	REVISION EXAM GRADE	N	MEAN RANK
	Sufficient	38	122.18
	Good	63	114.78
LEISURE	Very good	75	88.61
	Excellent	27	80.96
	Total	203	

TABLE 6: RELATIONSHIP OF LEISURE-RELATED VOCABULARY AND REVISION EXAM GRADES

The mean ranks suggest that the lower achievers wrote about leisure more than the higher achievers. More precisely, the students who received sufficient and good grades thought and wrote about leisure activities significantly more often than the students who received excellent grades (p = .047 and p = .020, respectively). It is possible that, unlike the lower-achieving students, the high-achieving students perceived their task of writing a self-introductory

essay as a formal type of writing which consequently resulted in not presenting themselves through leisure activities.

Furthermore, carrying out the Spearman correlation test, we recorded a statistically significant correlation for the pronouns *I* and *we* and the leisure-related vocabulary. Namely, when describing leisure activities, the students who obtained good grades wrote about their personal leisure activities [r_s (63) = .446, p = .000], i.e. they did not describe any collective sports or group leisure activities [r_s (63) = -.319, p = .011] thus individualising themselves. However, when we broke the population down into the branches, we realised that the said correlation applies to the Computer Engineering [r_s (114) = .277, p = .033; r_s (114) = -.185, p = .049] and Informatics [r_s (36) = .379, p = .023; r_s (36) = -.337, p = .045] students. To put it in another way, the students studying at other branches either did not write so much about leisure activities or they used general and impersonal examples.

We were further interested in potential gender differences in the use of leisure-related vocabulary and revision exam grades whose Kruskal-Wallis test results are listed in Table 7.

GENDER	CATEGORY	REVISION EXAM GRADES	N	MEAN RANK
MALE	LEISURE	Sufficient	35	99.67
		Good	59	93.81
		Very good	59	71.37
		Excellent	16	70.66
		Total	169	
FEMALE	LEISURE	Sufficient	3	18.00
		Good	4	12.88
		Very good	16	19.03
		Excellent	11	16.82
		Total	34	

TABLE 7: LEISURE-RELATED VOCABULARY WITH RESPECT TO GRADES AND GENDER

As can be seen from the table, the male students who obtained sufficient grades wrote about leisure activities significantly more than the students who obtained excellent grades (p = .035). It might be possible that the lower achieving students play different sports

or deal with other leisure activities, which results in their lower grades. On the other hand, even though the difference was not statistically significant (p = .725), the female students who received good grades focused on spare-time activities the least, which supports out hypothesis and previous findings that the lower-achieving female students are overtrying to present themselves. In addition to intragroup differences, we recorded intergroup differences by performing the Mann-Whitney test. The male students (M = 180.662), in general, wrote about their leisure activities more frequently (p = .000) than the female students (M = 69.09). A lack of the correlation of the leisure-related vocabulary and the pronoun *I* in the sample of the female students' essays [r_s (34) = .048, p = .786] points to the female students who, when writing about leisure activities, spoke generally while the male students described what they do in their spare time [r_s (169) = .348, p = .000].

PUNCTUATION CATEGORIES

LIWC provides the analysis of all punctuation categories ranging from period and comma to dashes and parenthesis. However, we will only elaborate on the ones which were used differently by our participants or in previous similar research.

PERIOD

A period is a punctuation mark used to end thoughts and sentences. It is the punctuation mark which is the easiest to master by students regardless of whether they study a native or foreign language. LIWC counts all periods in a text including decimal points and periods used after shortened words (Ltd., Mr., Dr., etc.). However, since we were interested only in periods marking the end of a sentence, we screened the essays and removed all periods which do not mark the end of sentences. The results are presented in Table 8.

	REVISION EXAM GRADE	N	MEAN RANK
	Sufficient	38	129.37
	Good	63	103.75
PERIOD	Very good	75	101.45
	Excellent	27	60.94
	Total	203	

TABLE 8:   THE USE OF PERIODS WITH RESPECT TO REVISION EXAM GRADES

What stands out in the table is that the students who obtained excellent grades used periods the least, which means that their essays had the lowest number of sentences. More specifically, the students who received sufficient grades wrote significantly more sentences than the students who received very good (p = .042) and excellent (p = .000) grades. Also, the students graded with good and very good grades wrote significantly more sentences than the students graded with excellent grades (p = .014 and p = .027, respectively). Another interesting finding was recorded with the Spearman correlation test. The students who obtained excellent grades used fewer but more complex sentences [r_s (27) = -.884, p = .000], which is in agreement with our words per sentence results. Similar significant correlations were not found for other students. So, according to our results, the more English language knowledge students have, the fewer but more complex sentences they use.

Furthermore, the only intragroup difference was found for the Computer Engineering students. The students graded with sufficient grades (M = 83.15) wrote more sentences than the students graded with good (M = 57.13, p = .038), very good (M = 58.01, p = .019) or excellent (M = 36.14, p = .000) grades. However, like the previously reported results, the students who obtained excellent grades wrote more complex sentences [r_s (21) = -.950, p = .000].

While there were no significant intergroup gender differences (p = .145), the male students who received excellent grades (M = 45.94) composed significantly fewer sentences than the students who received sufficient (M = 105.29, p = .001) or good (M = 85.19, p = .041) grades. On the other hand, no significant differences were found for the female students (p = .305). However, for both groups of students, we found significant negative correla-

tions; the more sentences the male [r_s (169) = -.959, p = .000] and female [r_s (34) = -.929, p = .000] students composed, the shorter their sentences became.

COMMA

In addition to a period, a comma is the most frequently used punctuation mark whose function is to separate words and word groups into series and indicate a brief pause in speaking. The number of rules for using a comma and the incompatibility with the native language rules makes mastering the comma usage very difficult for students. Nevertheless, students usually do acquire the most basic rules of separating items when listing them.

As is clear from the Kruskal-Wallis test results presented in Table 9, the students who acquired excellent grades used commas the most whereas the students who acquired sufficient grades used them the least; however, the difference was not statistically significant (p = .112).

	REVISION EXAM GRADE	N	MEAN RANK
	Sufficient	38	89.62
	Good	63	95.91
COMMA	Very good	75	106.01
	Excellent	27	122.50
	Total	203	

TABLE 9: THE USE OF COMMAS WITH RESPECT TO REVISION EXAM GRADES

Even though the difference was not statistically significant, the result points to high performing students as more punctilious, which is to be expected. Upon acquiring knowledge on a phonological, morphological, syntactical and lexical level, higher-performing students acquire stylolinguistic rules more efficiently. They usually read and listen to more materials in a foreign language which makes them exposed to suprasegmental features such as stress, intonation and tempo, which eventually results in their more frequent and confident usage of punctuation marks.

That being said, we expected that the higher performing students would use commas in complex sentences so we performed the Spearman correlation test to examine that. To our surprise,

there was no statistically significant correlation between the use of commas and words per sentence [r_s (27) = -.008, p = .920], which might imply that even the higher-performing students did not master the use of commas and omitted them where they should have used them (e.g. in subordinate clauses, in cases of inversion, etc.). They have probably used commas just for listing items, i.e. they might have used them incorrectly in relative clauses and in front of the conjunctions *and*, *but* and *or*.

Furthermore, we were unable to record intergroup and intra-group differences with respect to the branches the students study at. More precisely, the results, shown in Table 10, indicate that the higher-performing students studying at almost all branches used more commas than the lower performing students. However, none of the differences were statistically significant (p = .110, p = .466, p = .281, p = .447, p = .683 and p = .385).

TYPE	BRANCH	VARIABLE	REVISION EXAM GRADE	N	MEAN RANK
UNIVERSITY STUDY PROGRAMME	POWER ENGINEERING	COMMA	Sufficient	2	2.50
			Good	5	12.00
			Very good	12	10.50
			Excellent	1	19.00
			Total	20	
	COMMUNICATIONS AND INFORMATICS	COMMA	Sufficient	2	4.50
			Good	4	8.75
			Very good	7	10.14
			Excellent	3	7.00
			Total	16	
	COMPUTER ENGINEERING	COMMA	Sufficient	17	46.71
			Good	30	54.38
			Very good	46	59.36
			Excellent	21	66.62
			Total	114	

TABLE 10: THE USE OF COMMAS WITH RESPECT TO BRANCHES AND REVISION EXAM GRADES

PROFESSIONAL STUDY PROGRAMME	POWER ENGINEERING	COMMA	Sufficient	3	3.67
			Good	4	6.25
			Very good	2	4.50
			Excellent	0	0
			Total	9	
	AUTOMATION	COMMA	Sufficient	4	5.25
			Good	3	3.67
			Very good	1	4.00
			Excellent	0	0
			Total	8	
	INFORMATICS	COMMA	Sufficient	10	20.50
			Good	17	15.91
			Very good	7	19.21
			Excellent	2	28.00
			Total	36	

TABLE 10: THE USE OF COMMAS WITH RESPECT TO BRANCHES AND REVISION EXAM GRADES

Additionally, what stands out is the correlation of commas and complex words and sentences for two branches. Namely, the university study programme Power Engineering students used commas in complex sentences [r_s (20) = .484, p = .030] and the Communication and Informatics students used them in sentences containing more scholarly vocabulary [r_s (16) = .668, p = .005]. This result indicates that the students studying at these two branches acquired and used commas more efficiently and correctly than the students in other branches.

The Mann-Whitney test results suggest that there were no significant (p = .510) gender differences between the male (M = 100.78) and female (M = 108.06) students' usage of commas. Our study was unable to replicate Robinson et al.'s (2013) results on the higher usage of commas by male students. However, we did record intragroup differences presented in Table 11.

GENDER	CATEGORY	REVISION EXAM GRADES	N	MEAN RANK
MALE	COMMA	Sufficient	35	79.81
		Good	59	82.40
		Very good	59	85.76
		Excellent	16	103.13
		Total	169	
FEMALE	COMMA	Sufficient	3	2.67
		Good	4	10.50
		Very good	16	20.22
		Excellent	11	20.14
		Total	34	

TABLE 11: USE OF COMMAS WITH RESPECT TO GRADES AND GENDER

While there were no significant differences within the group of the male students (p = .428), the female students who obtained sufficient grades used significantly fewer commas than the students who obtained very good (p = .018) and excellent (p = .028) grades. The Spearman correlation test suggests that the female students used commas in more complex sentences [r_s (34) = .304, p = .051] in comparison to their male colleagues [r_s (169) = -.068, p = .379]. It seems possible that the female students were more appreciative of the punctuation rules and suprasegmental features of intonation, stress and tempo thus used commas where/when they "heard" them.

CONCLUSIONS

The aim of this research was to examine if the students' revision exam grades, and consequently English language knowledge, correlate with the way they write. For the purpose of the research, 203 undergraduate students studying at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek voluntarily submitted brief written self-introductory essays. Upon correcting spelling mistakes and technical preparation of the essays, they were analysed with the *Linguistic Inquiry and Word Count* software which is a well-accepted tool for a computation analysis of

DRAGANA BOŽIĆ LENARD, YVONNE LIERMANN-ZELJAK, IVANKA FERČEC

texts. Essentially, it calculates the degree to which one uses different categories of words. The computational analysis results were uploaded in the software for statistical analysis SPSS where the variables of the students' gender, branch of study and revision exam results were added. Taking into account the uneven distribution of the participants' gender and branches they study at along with the nature of the LIWC variables, the nonparametric Mann-Whitney, Kruskal-Wallis and Spearman correlation tests were performed.

The results showed that the higher-performing students were the most elaborative in their essays. Probably due to their solid English language knowledge, the higher performers used more examples and clarified their arguments thus using longer sentences. Simultaneously, they used fewer sentences. To put it in another way, the higher achievers used fewer but more complex and elaborative sentences. Even though it was not statistically significant, our results point to the higher achievers as more punctilious; however, since we did not correct the students' mistakes in the use of a comma, the results might have been skewed. Another expected result was that the higher performers used more complex, academic and obscure vocabulary aiming to demonstrate their language knowledge and stand out from the group. Furthermore, adopting Pennebaker's (2013) hypothesis that lower achievers use more pronouns, whose usage implies that people think, talk and/or write about other people, we can draw a conclusion that the lower achievers were more other-oriented. When mentioning others, the students focused on their male friends and family members. Moreover, female friends, family members or otherwise important people were only given attention by the male students. Additionally, when writing about other people, the lower achievers were more emotional, tentative and consequently less eloquent. In comparison to the social category of pronouns used by the lower achievers, the higher achievers use the informational category of articles and nouns thus conforming to the stereotype of higher achievers being categorical thinkers talking/writing about events and things and lower achievers being dynamic thinkers focusing on others. Furthermore, our study demonstrated that the middle achievers (students who obtained good grades) presented themselves by writing about their work-related achievements, which might be perceived as their way of standing out. On the other hand, the lower achievers were focused on more private things and presented themselves

through their leisure activities. Taken together, these results suggest the expected verbal expressions – the more English language knowledge students have, the more complex, obscure and elaborative words and sentences they use. Also, the higher achievers are task-oriented demonstrating an informational style whereas the lower achievers are other-oriented developing a dynamic thinking and verbal style.

Our second research question dealt with potential branch differences in the use of the above mentioned categories. The lower-achieving Computer Engineering students used fewer and less complex and shorter sentences as well as more ordinary and plain words than their higher-achieving colleagues. Furthermore, the use of commas in complex and more advanced vocabulary sentences by the university undergraduate Power Engineering and Communications and Informatics students suggests that those students used commas more efficiently than the other branch students. The hypothesis of lower achievers using more pronouns applied only to the lower-achieving Computer Engineering students who were shown to be more other-oriented than their higher achieving colleagues. Only higher-performing Computer Engineering students were proven to be things- and events-oriented significantly more than their lower-achieving colleagues. To paraphrase, the stereotype of lower achievers using more social words (pronouns) and higher achievers using more informational words (nouns and articles) applied only to the Computer Engineering students. The overall results on branch differences point to the similarity in the knowledge levels of all branches the students study at except for the Computer Engineering students whose usage of the said categories is stereotypical and expected. However, we would like to acknowledge the limitations and possible skewness of the results due to small sample sizes for all branches except for Computer Engineering.

Our final research question considered potential gender differences in the use of the mentioned categories. While the male higher-achieving students stereotypically composed more complex words and sentences than the male lower-achieving students, the female students, regardless of their knowledge level, put more effort into their task of writing the self-introductory essay probably due to societal pressure to use more standardised forms and be at their best. Moreover, the low and middle achieving female students used more scholarly vocabulary than their higher-achieving

colleagues, which further supports our hypothesis of feeling societal pressure and putting more effort into their assignments thus compensating for the lack of knowledge. Furthermore, the male students behaved stereotypically with respect to the lower achievers in terms of using pronouns and being other-oriented whereas the female low-achieving students used pronouns the least. They focused on presenting themselves without acknowledging other people who might have helped in establishing their identities because they possibly perceived that as a sign of weakness. Another expected behaviour was that the high-achieving male students used more articles and nouns thus conforming to the stereotype of higher achievers using an informational categorical style. To compare, the middle achieving female students, who used articles the most, corroborated our hypothesis that the female students worked harder than expected. Even though it was not statistically significant, the results on personal concerns showed that the lower-performing female students are more focused on and write about their achievements than their higher-achieving colleagues. The overall results on the relationship of gender and revision exam grades suggest that while the male students behaved expectedly in the use of the said categories, the female students devoted more time and put more effort into their task completion, fought with societal pressure compensating for the lack of knowledge and trying to establish their identity in the male-dominated field.

Taking everything into consideration, the need to redefine writing skills and ESP teaching per se is mandatory. At the tertiary level of education, students should be competent to express their thoughts in a foreign language in at least an intermediate level. Therefore, ESP teachers should come up with alternative methods of teaching writing skills in a way to teach students to present themselves in an appealing and intriguing way to potential employers because how they write might be more revealing than what they write about.

LIMITATIONS OF THE RESEARCH

There are several weak points of our research. Since we did not want to interfere with the students' stylistic expression, we did not correct their essays regarding commas so that results might have been skewed due to the students' incorrect usage of the punctuation mark. Also, our research results are limited in a way that they

do not allow us to make generalisations about prototypical linguistic behaviour related to knowledge level given the fact that the research was done on a small sample of students. However, we got some useful insights that will shed some light on possible prediction of students' performance, which might be used by faculty management or potential employers looking for higher achievers.

RECOMMENDATIONS FOR FURTHER RESEARCH

The present study suggests a new perspective of education assessment. A more immediate way to proceed to complement our results is to conduct a study on a larger scale, i.e. include more students studying at different branches and faculties. Researchers could take a prescriptive approach; use our research results to test their participants' expression, test, accept or reject our hypotheses as well as examine other variables which prove to be used significantly differently by their participants. All these studies might set a new directive in education assessment especially beneficial to management of competitive higher education institutions and employers looking for strong and skilful candidates.

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DRAGANA BOŽIĆ LENARD, YVONNE LIERMANN-ZELJAK, IVANKA FERČEC

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Резиме

РЕДЕФИНИСАНИ ПРИСТУП ОЦЕЊИВАЊУ СТУДЕНАТА ЗАСНОВАН НА ПИСАЊУ ЕСЕЈА У НАСТАВИ ЕНГЛЕСКОГ ЗА ПОСЕБНЕ НАМЕНЕ

Због оштре конкуренције приликом пријављивања и запошљавања на реномиране универзитете, процењивање и профилисање кандидата постало је неопходност. Традиционалне методе процене кандидата на основу оцена више не дају задовољавајуће резултате и не обезбеђују јасну слику о кандидату. Потребно је проценити кандидата и предвидети његов успех од успешности у настави до радног места. Наше истраживање има за циљ да испита потенцијалне корелације између студентских есеја и испитних оцена на курсевима енглеског за посебне намене. Укупно 203 студента доставило је своје есеје за аутоматску (LIWC) и статистичку (SPSS) анализу. Резултати су показали да су студенти са бољим успехом имали сложеније реченице и стручнији вокабулар, који су директно везани за тему задатка. За разлику од њих, студенти са слабијим успехом користили су једноставније реченице у ширем контексту и имали су вербално

динамичнији стил. Међутим, стереотипно понашање показали су само испитаници мушког пола због очекивања околине, док су испитанице посвећивале више пажње успешном испуњавању задатка, који имају за циљ компензацију за недовољно знање у настојању да се искажу у области у којој доминирају мушкарци.

КЉУЧНЕ РЕЧИ: есеји; оцењивање; корелација; испитне оцене; LIWC; SPSS; енглески за посебне намене.

DRAGANA BOŽIĆ LENARD, YVONNE LIERMANN-ZELJAK, IVANKA FERČEC