

# Assessing the influence of the English language on the professional vocabulary of Croatian dental students by analysing their word choice for the translation of medical/dental terms

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This study was performed to investigate the influence of the English language on the medical/dental terminology of Croatian dental students. It emerged from the terminological projects of the School of Dental Medicine, University of Zagreb that had been conducted as a part of the national programme the *Development of Croatian Special Field Terminology*. Students were asked to translate English sentences allegedly extracted from dental literature into Croatian. The results showed that most students translated the offered English terms using anglicisms rather than choosing Croatian terms. The finding that students distinctively prefer professional literature in Croatian suggests that their professional vocabulary is mostly modelled by the Croatian educational materials and by the discourse of instruction. These results suggest the need for further activities concerning the popularization of Croatian medical/dental terminology for the purpose of preservation and development of a native professional vocabulary and of improving communication with patients and patients' understanding of medical information.

**Keywords:** English to Croatian translation, medical/dental terminology, domain specific vocabulary acquisition, health communication, health literacy

## 1. Introduction

The body of a professional vocabulary of health professionals forms during the time of their official education. According to Amundson Romich (2001, in Sartori 2013, 23), “studying medical terminology is like learning a new language.” In

non-English-speaking countries, such as Croatia, this process is, nevertheless, under a considerable influence of the English language, both at the lexical and syntactical level. The influence of English on the development and standardization of domain specific terminology is not an uncommon phenomenon in most European languages (Kontra 1982; Nagy 2013; Onysko 2007; Kovács 2009; Picone 1996; Carli and Calaresu 2003; Šabec 2005; Ricart Vayá and Candel Mora 2009; Alcaraz Ariza 2012; Gjuran Coha 2011), since English has gained the status of *lingua franca* in academic research and in international professional communication.

The influence of English on the acquisition of Croatian dental students' professional language may be direct, through the use of textbooks and other educational materials in English, but it can also occur through an engagement in scientific work, and/or writing professional papers for students' journals. Moreover, the Dental Students' Association in Croatia is an organizer of two important international events, Virtual World Congress of Dental Students, and EDSA Summer Camp Croatia. Finally, Croatian students can apply for students' exchange programmes of the Erasmus Student Network, where language differences may not be regarded as a problem, but as a way of developing personal and professional competence (Myhre 2011).

One of the reasons why using the English language may directly influence the formation of a professional vocabulary of Croatian dental students is that many medical/dental terms in Croatian share the same word stem with English terms. Many of these terms are in fact internationalisms derived from Greek and Latin forms and not true anglicisms. However, they are frequently loaned from modern languages, nowadays most commonly English (Bratanić and Brač 2013), and thereby not always adjusted to the standard Croatian language. It can be assumed that students, when reading or listening in English, often choose or are subconsciously driven to use a Croatian word that shares the same word stem with the English word, that is, to use an anglicism. This is because (standardized) Croatian terms usually have a distinctive form, so their recollection from memory requires some time and effort. Vice versa, the common use of internationalisms and anglicisms in Croatian dental terminology makes it easier to establish a dialogue in English when necessary, e.g. in communication with foreign fellow students or foreign guest teachers.

Another way in which the English language influences dental students' professional vocabulary is through the Croatian terminology that their teachers use in lectures and in written teaching materials. A continuous exposure of Croatian teachers to English terminology for their personal professional and scientific development may significantly influence the terminology they use when working with Croatian students, especially if they are simultaneously engaged in the teaching of foreign students in the English language. It can be assumed that frequent

“switching” between English and Croatian may gradually lead to favourizing medical and dental terms in Croatian that share the same word stem with English terms, as well as increase the use of untranslated or improperly translated loan-words. Such a process inadvertently and imperceptibly suppresses the usage of standard Croatian words and may lead to a gradual impoverishment of Croatian medical and dental terminology. Vrdelja (2011) states that, unlike many renowned Croatian linguists who oppose the extensive use of anglicisms in the Croatian language and who advocate the need for the creation and use of new Croatian words instead of borrowings, the speakers of the Croatian language, who are in fact the driving force of language change, on average show a high degree of indifference towards the constant penetration of anglicisms into the Croatian language, and they readily and easily accept new terms and expressions from the English language. Several studies assessing the influence of the English language in different domains can support this statement. Josić (2014) describes the increasing uncritical acceptance of the English language influence in the language of Croatian web portals. Her analysis showed that the norms of the Croatian linguistic standard are often so broken down by “ready-made” loaning from the English language that she raised the question whether these disruptions were becoming characteristic of web journalism and a silently accepted way of a part of public communication. Opačić (2006) also criticises the extensive and unjustified use of anglicisms in the language of the media (newspapers, television) and considers this a threat to the Croatian language on the lexical, morphological, syntactical and other levels. Following the analysis of the English borrowings in the Croatian sustainable agriculture terminology, Perković et al. (2014) offered possible Croatian replacements for anglicisms for the purpose of contributing to the Croatian standard language. In the field of electrical engineering new terms appear on a daily basis and, especially those relating to computer terminology, rapidly penetrate into various professions and everyday life, which makes it not only a problem of the specialized language, but one of the general language as well. Besides the difficulties in finding appropriate equivalents in due time, an additional problem in the popularization of (new) Croatian terms in the domain of computing and modern technology could be a highly positive attitude towards the use of anglicisms because of the close relationship between English and computer science. It has been noticed that anglicisms are preferred in Croatian popular magazines and scientific journals of this field even when there are accepted Croatian equivalents (Liermann-Zeljak 2013). Zauberga (2005) suggests that the societies that are forced to continuously import techniques, science and technology, and which are recipients of knowledge created by others in other languages should control the entrance of adapted or direct borrowings if they want to ensure that their own language is not overwhelmed by foreign structures.

The readiness of the medical/dental students to accept and use loanwords in their professional vocabulary could be influenced by the factors which facilitate the influence of the English language on their general lexical inventory. These include learning English from an early age (i.e. growing familiarity with the English language), modern technological advances, and improperly translated or untranslated English words frequently encountered in the media, especially in the domains which are important for young people such as technology, (pop) culture and sports (Josić 2014; Drljača Margić 2011). An increased number of the English-as-a-second-language speakers and their communicative competence are, according to Nikolić-Hoyt (2005), the reasons why many English words are not perceived as a foreign element and unadapted forms are retained as a result, especially in the domains characterized by a fast entry of foreign words such as information and communications technology (ICT). A line of research by Drljača Margić (2010, 2011, 2012) on the Croatian speakers' attitudes toward (the use of) anglicisms and their Croatian equivalents reveals that a majority of the respondents consider today's presence of anglicisms in Croatian as an inevitable and expected phenomenon.

Generally, favourizing medical/dental loanwords should not significantly affect a mutual understanding between teachers and Croatian dental students, but will surely lead to difficulties in the (future) discourse with the patients. Evidence shows that communication between doctors and patients in all medical branches is frequently overburdened by medical jargon and complex medical phrases resulting in confusion and misunderstanding by the patient (Gibbs et al. 1987). Patients often misinterpret or cannot correctly define even certain commonly used medical terms such as *benign* and *malignant* (O'Connell et al. 2013) (in Croatian: *benigni* and *maligni*). The educational materials and written instructions for dental and craniofacial patients are often inappropriately prepared (Alexander 1999, 2000; Patel et al. 2011) and surveys conducted to determine the number and type of the communication techniques that dentists commonly use found a low routine use of all of the communication techniques (using simple language, speaking more slowly, writing out instructions, reading instructions aloud, asking patients to repeat information or instructions, underlining key points in the patient information handout, drawing or using pictures, using models or videos to explain, making follow-up telephone contacts to check understanding and compliance, etc.) including the techniques thought to be most effective with patients with low literacy skills (Rozier et al. 2011; Maybury et al. 2013). Based on their results, Maybury et al. (2013) suggest that professional education is needed both in the dental school curricula and in the continuing education courses to increase the use of the recommended communication techniques.

Because of its global role and status in the academic and research settings, the influence of English on the Croatian medical/dental terminology cannot

be avoided, but should be better controlled. To help overcome these problems, and to contribute to the preservation of the Croatian standard language, the School of Dental Medicine, University of Zagreb joined the programme named the *Development of Croatian Special Field Terminology* (referred to here by its Croatian acronym STRUNA). Its aim is to standardize the Croatian terminology across various professional domains through a cooperation between domain experts and terminologists and language experts (Bratanić and Ostroški Anić 2013). The Struna termbase, officially launched in February 2012, makes standardized Croatian terms with their definitions, Croatian synonyms, equivalents in several European languages and other useful data available to the public. The School of Dental Medicine, University of Zagreb contributed to the development of a standardized Croatian special field terminology in the fields of dental medicine (the project *Croatian Dental Terminology* or HRSTON, 2009–2010), anatomy and physiology (the project *Croatian Anatomical and Physiological Terminology* or HRANAFINA, 2012–2013), and, currently, in the field of pharmacology (the project *Croatian pharmacological terminology* or FARMANA, 2016–2017).

This survey was conducted after the first two terminological projects of our School officially ended. We wanted to gain an insight into the way the Croatian dental students would translate the English sentences that had been presented as extracted from dental literature. The sentences were formulated in a way as to include several terms that could be translated either with a Croatian term or with a loanword that shared the same word stem as the offered English term, that is, with an anglicism. The primary goal of the survey was to assess whether the students would rather choose Croatian terms instead of anglicisms. Additionally, the questionnaire served to collect other data that could be used to gain a better understanding of their choices.

## 2. Method

### 2.1 Ethics approval and participants

The study was approved by the Ethics Committee of the School of Dental Medicine, University of Zagreb, Croatia. The participants were Croatian students of the School of Dental Medicine, University of Zagreb and the students studying dental medicine at the School of Medicine, University of Rijeka. They were in the 9th or 10th semester of their 12 semesters' integrated undergraduate and graduate university study programme. The estimated number of participants needed to arrive at a trustworthy interpretation of the research questions was about 150. The survey was conducted in the academic years 2013/2014, 2014/2015 and 2015/2016.

## 2.2 Study design

The students were invited to take part in this anonymous survey by filling a self-administered questionnaire at the beginning or at the end of one of their regular lectures or practicals. The students were unaware of the primary purpose of the study.

The beginning of the questionnaire requested the following information from the participants: gender, age, type of high school education and a self-assessment of one's knowledge of the English language by choosing a grade on a 5-point scale ranging from 1 (insufficient knowledge) to 5 (excellent knowledge). The students were then offered a total of 13 sentences in English (divided into seven units and allegedly extracted from dental literature) and asked to translate them into Croatian. In the end, the students were asked to give answers to the following questions (translated here from Croatian into English by the authors):

- A. Have you used hardcopies or online editions (pdf or other format) of medical/dental textbooks and handbooks in English during your studies?
- B. Have you used professional/scientific journals in English available in the libraries at the School of Medicine or the School of Dental Medicine and/or on the internet?
- C. Would you like more textbooks and handbooks to be translated into Croatian?
- D. Do you think that certain medical/dental terms are often denoted with different Croatian terms in different professional books and in the discourse of different teachers?
- E. Do you think it is justified to use words of foreign origin (e.g. *spreader*, *diskoloracija*, *pacemaker*) if there are Croatian equivalents (Croatian terms for the above examples were given here: *proširivač*, *obojenje*, *srčani elektrostimulator*)?
- F. Do you think it is important to create and use Croatian terms for English terms that to date have no Croatian equivalents and that refer to newly discovered or newly applied processes, phenomena, methods, surgical procedures, medicines, and the like?
- G. Would you be willing to start using a standardized Croatian term instead of a loanword in spoken and written communication, even if that loanword has been used in everyday communication for quite some time?
- H. Would you use the Croatian terms that you used to translate sentences in this questionnaire in the communication with your patients who have no formal medical education?

The questions were answered using the 5-point Likert's scale: For A and B: 1 very often, 2 often, 3 occasionally, 4 rarely, 5 never. For C–H: 1 yes, 2 mainly yes, 3 neither yes nor no, 4 mainly no, 5 no. These questions will, where appropriate, be shortened and/or referred to as A, B, etc. Since some of these questions could have

implied the true purpose of the survey to the mindful student, they were raised after the students had, expectedly, translated the sentences.

### 2.3 Statistical analysis

A total of 50 terms were analysed. The ways in which the terms were translated were: translation omitted, Croatian term (Cro), anglicism (Eng), Croatian term with an anglicism in parenthesis (or aside) (Cro+Eng), anglicism with a Croatian term in parenthesis (or aside) (Eng+Cro), wrong translation. Table 1 provides a list of the analysed English words and their translations distinguishing between anglicisms and Croatian terms.

**Table 1.** A list of the analysed English terms and their translations

Analysed terms from the sentences in English ( <i>N</i> = 50)	Anglicism (Croatian term resembling the English term)	Croatian term
Residual	Rezidualni	Zaostatni; ostatni
Apex	Apeks	Vršak; vrh
Mandibular	Mandibularni; mandibule	Donjočeljusni; donje čeljusti
Central	Centralni	Središnji; srednji
Incisor	Inciziv	Sjekutić
Extracted	Ekstrahiran	Izvađen
Partial	Parcijalni	Djelomični
Dental	Dentalni	Zubni
Prosthesis	Proteza	Nadomjestak
Ossification	Osifikacija	Okoštavanje
Dental	Dentalni	Zubni
Alveola	Alveola	Čašica
Mandible	Mandibula	Donja čeljust
Mastication	Mastikacija	Žvakanje
Temporomandibular	Temporomandibularni	Čeljusni; žvačni
Mandible	Mandibula	Donja čeljust
Temporal	Temporalni	Sljepoočni
Premolar	Premolar	Pretkutnjak
Extracted	Ekstrahiran	Izvađen
Fracture	Fraktura	Prijelom; lom
Radix	Radiks	Korijen
Dental	Dentalni	Zubni

**Table 1.** *(continued)*

Analysed terms from the sentences in English (N = 50)	Anglicism (Croatian term resembling the English term)	Croatian term
Implant	Implantat	Usadak
Malignant	Maligni	Zloćudni
Ulcer	Ulkus; ulceracija	Vrijed; čir
Sublingual	Sublingvalni	Podjezični
Dental	Dentalni	Zubni
Calculus	Kalkulus	Kamenac
Lingual	Lingvalni	Jezični
Interdental	Interdentalni	Međuzubni; između zubi
Anterior	Anteriorni	Prednji
Secretion	Sekrecija	Lučenje; izlučivanje
Oral	Oralni	Usni; usta; usne šupljine
Pharyngeal	Faringealni	Ždrijelni
Mucosa	Mukoza	Sluznica
Dental	Dentalni	Zubni
Caries	Karijes	Kvar
Cervical	Cervikalni	Vratni
Forming	Formiranje	Oblikovanje
Bolus	Bolus	Zalogaj
Deglutition	Degluticija	Gutanje
Malnutrition	Malnutricija	Pothranjenost
Gastric	Gastrični	Želučani
Dental	Dentalni	Zubni
Pharyngeal	Faringealni	Ždrijelni
Mucosa	Mukoza	Sluznica
Esophageal	Ezofagealni; ezofagusa	Jednjačna; jednjaka
Mucosa	Mukoza	Sluznica
More resistant	Rezistentniji	Otporniji
Parotid	Parotidni	Podušni; doušni; zaušni

Based on the students' choices, several outcome variables were formed in order to determine their preferences in translation, and to assess their choices as a function of different explanatory variables.

To determine the total number and the percentage of the English terms that were preferentially translated with Croatian terms, the categories Cro and

Cro+Eng were coded as 1, the others as 0. The normality of distribution was tested with Kolmogorov-Smirnov test.

To determine the percentage of students who preferred Croatian terms to anglicisms, two outcome variables were formed. To determine the total number of English terms that were preferentially translated with Croatian terms, the categories Cro and Cro+Eng were coded as 1, the others as 0. To determine the total number of English terms that were not translated with Croatian terms, the categories Eng and Eng+Cro were coded as 1, the others as 0. Some of the offered terms were not translated. In these cases, if neither the choice of Croatian terms nor anglicisms reached 50%, the choice that reached a higher percentage was used to denote students' preferences. If the number of Croatian terms and anglicisms was equal (5/159 or 3% of the sample), the students' preference was designated to anglicisms.

Five of the English terms (*extracted*, *dental*, *mandible*, *pharyngeal* and *mucosa*) were offered for translation more than once in order to assess if these terms would (not) be consistently translated with Croatian words. We also wanted to value if the context or the collocation in which the concerned English term occurred would influence the students' choice of translation, particularly the translation of the adjective *dental*, which was offered in conjunction with five different nouns. The consistency in translation was analysed by calculating Cohen's kappa using two outcome variables, translation with a Croatian word (Cro) and with an anglicism (Eng). Cohen's kappa was additionally calculated to assess the agreement in the translation of four pairs of different English terms because of either their resembling form (*sublingual*, *lingual*) or their proximity in the sentences and the use in almost identical context/collocation (e.g., *oral and pharyngeal mucosa*).

In order to assess if gender, age, type of high school education, self-assessment of one's knowledge of the English language, and the answers or attitudes reflected through the answers to the questions A–H were significant predictors of students' preferences in translation, two dichotomous variables were used, 0 = anglicisms preferred and 1 = Croatian translation preferred. For this purpose, logistic regression, linear regression, Pearson's correlation, Chi-Square test and ANOVA were performed.

The frequency of a specific answer offered on the Likert's scale for the questions A–H was calculated in order to gain an insight into the use of foreign literature and the students' attitudes toward the terms used in the Croatian language at the level of the whole sample. The same was done for the self-assessment of knowledge of the English language.

Pearson's correlation was performed to assess if there was an association between the students' preferences in translation and the answers they gave to the questions A–H, as well as to assess the correlation between the answers to questions A–H.

The data were analysed using the statistical software IBM SPSS 22 (IBM Corp., Armonk, NY, USA) with the significance preset at  $\alpha < 0.05$  for a two-sided test.

3. Results

A total of 163 students completed the questionnaire. Four of the questionnaires were excluded from the analysis because they were only partially completed. The students (79% females) were aged 21–28 years (median 23, interquartile range 23–24).

Out of the total number of students who validly completed the questionnaire, 40% preferred the Croatian terms to anglicisms for the translation of the offered English terms.

The total number and the percentage of the English terms that were preferentially translated with Croatian terms in relation to the total number of the English terms offered for translation were  $23.5 \pm 7.2$  and  $46.9 \pm 14.4\%$  (mean  $\pm$  SD), respectively. A more detailed statistics is given in Table 2.

Table 2. Descriptive statistics of the sample,  $N = 159$

	Cro	% Cro	Cro preferred	% Cro preferred	Eng preferred	% Eng preferred	Wrong and missing
Mean	23.5	46.9	22.8	45.5	25.1	50.2	4.3
SD	7.2	14.4	7	14	7	13.9	5.6
Median	23	46	22	44	25	50	2
IQR	19–29	38–58	18–27	36–54	21–30	42–60	2–6
Minimum	7	14	6	12	6	12	0
Maximum	44	88	43	86	42	84	40

Cro = number of Croatian terms; % Cro = percentage of Croatian terms; Cro preferred = Croatian translation preferred (only Croatian term or Croatian term with an anglicism in parenthesis); % Cro preferred = percentage of Croatian translation preferred; Eng preferred = anglicisms preferred (only anglicism or anglicism with a Croatian term in parenthesis); % Eng preferred = percentage of anglicisms preferred; SD = standard deviation; IQR = interquartile range.

For the calculations of Cohen’s kappa, two outcome variables were used: the translation with a Croatian term (Cro) and with an anglicism (Eng), therefore, the sample size was slightly reduced. The results of this analysis are presented in Table 3.

**Table 3.** Cohen's kappa for the English terms offered for translation more than once, for the terms with resembling form, or used in similar context/collocation

Word	N	$\kappa$	$p_o$ (%)	Cro (%)
extracted/extracted	157	0.67	87	68
mandible/mandible	154	0.55	93	5
pharyngeal/pharyngeal	143	0.80	90	41
mucosa/mucosa (1)*	151	0.80	93	75
mucosa/mucosa (2)	155	0.82	94	77
sublingual/lingual	148	0.33	65	28
lingual/interdental	148	0.50	79	20
oral/pharyngeal	153	0.32	70	12
pharyngeal/esophageal	144	0.45	72	44

$N$  = sample size;  $\kappa$  = Cohen's kappa;  $p_o$  = observed proportionate agreement; Cro = choice of the Croatian term.

\* The word *mucosa* occurred three times and Cohen's kappa was first calculated for the two words occurring in different units (1) and then for the two words occurring in the same unit (2);  $P < 0.001$ .

The term *dental* was offered for translation five times. Because of this, and because the translation of the term was frequently omitted, Cohen's kappa was not calculated in this case. Instead, the percentage of omitted translations and Croatian translations of the adjective *dental* is given, respectively, for the following collocations: *dental prosthesis*, 54.1% and 28.9%; *dental alveola*, 26.4% and 46.5%; *dental implant*, 25.2% and 23.3%; *dental calculus*, 1.3% and 82.4%; *dental caries*, 31.4% and 56%; *dental erosion*, 6.9% and 54.7%.

The sample was divided into two groups based on the students' preferences of the Croatian terms or anglicisms. The Student's *t*-test revealed no significant differences between the groups with regard to age, self-assessed knowledge of the English language and the answers given to the questions A–H.

The logistic regression demonstrated that the only variable that was a significant predictor of the students' preference toward the Croatian translation was the answer to question G, producing the odds ratio of 0.66 (95% CI 0.438–0.998,  $P = 0.049$ ). The results of ANOVA indicated that the female gender was a predictor of preference toward anglicisms ( $F = 5.893$ ,  $P = 0.016$ ) and Student-Newman-Keuls following ANOVA revealed that the students who had attended the classical gymnasium and the gymnasium of natural sciences and mathematics more often chose anglicisms ( $F = 4.308$ ,  $P = 0.002$ ).

According to the self-assessed knowledge of the English language, a great majority of students, 91.8% rated their knowledge as good (24.5%), very good (49.7%) or excellent (17.6%).

However, only 19.5% declared often (15.1%) and very often (4.4%) use of medical/dental textbooks and handbooks in English (A). 43.4% of students reported their occasional use, and 6.9% never used foreign literature.

On the other hand, 92.5% of the students answered with *yes* (57.9%) or *mainly yes* (34.6%) when asked if they would like more textbooks and handbooks to be translated into Croatian (C). Only 0.6% of the surveyed students found it unnecessary.

7.5% of students reported often and 3.1% very often use of professional/scientific journals in English (B). 59.1% of students rarely (41.5%) or never (17.6%) used professional/scientific journals in English.

Many students were uncertain what to answer to the question D. 37.7% answered with *neither yes nor no*, 36.5% answered with *yes* (12.6%) or *mainly yes* (23.9%), and 25.8% answered with *no* (1.3%) or *mainly no* (24.5%).

A majority of students think it is justified to use words of foreign origin if there are Croatian equivalents (E). 69.1% of the students answered with *yes* (27%) or *mainly yes* (42.1%). 20.1% answered with *neither yes nor no*. 4.4% answered with *mainly no*, and 6.3% with *no*.

39% of students answered with *yes* (18.9%) or *mainly yes* (20.1%) to the question F (Important to create and use Croatian terms for new methods, surgical procedures or newly discovered or newly applied processes, phenomena etc.), 29.6% answered with *neither yes nor no*, and 31.5% answered with *no* (16.4%) or *mainly no* (15.1%).

53.5% of the students answered with *no* (17%) or *mainly no* (36.5%) to the question G (Willing to use Croatian terms instead of established loanwords). 27.7% answered with *neither yes nor no*, 12.6% answered with *mainly yes*, and only 6.3% with *yes*.

55.3% of students answered *no* (15.7%) or *mainly no* (39.6%) to the question H (Would use the translation of English terms with patients). 20.8% answered with *neither yes nor no*, 15.1% with *mainly yes*, and only 8.8% answered with *yes*.

The results of Pearson's correlation showing the degree of association between the students' answers to the questions A–H are listed in Table 4.

**Table 4.** The results of Pearson's correlation for the whole sample,  $N = 159$ 

		EngK	A	B	C	D	E	F	G	H
EngK	r	1	-0.427	-0.387	0.030	0.042	-0.204	-0.006	0.118	-0.049
A	r	-0.427	1	0.618	0.017	0.014	0.127	-0.086	-0.052	0.073
B	r	-0.387	0.618	1	0.029	-0.013	0.153	-0.029	-0.120	0.204
C	r	0.030	0.017	0.029	1	0.138	-0.135	0.120	0.145	0.078
D	r	0.042	0.014	-0.013	0.138	1	-0.232	-0.031	0.108	0.002
E	r	-0.204	0.127	0.153	-0.135	-0.232	1	-0.297	-0.453	0.106
F	r	-0.006	-0.086	-0.029	0.120	-0.031	-0.297	1	0.557	0.081
G	r	0.118	-0.052	-0.120	0.145	0.108	-0.453	0.557	1	0.133
H	r	-0.049	0.073	0.204	0.078	0.002	0.106	0.081	0.133	1

EngK = Knowledge of English language (self-assessed); A–H = Questions to which the answers were given using Likert's scale.

Correlations in bold type are significant at  $P < 0.05$ .

#### 4. Discussion

The results of this survey show that 60% of the surveyed students preferred using anglicisms for the translation of the offered English terms rather than choosing an appropriate Croatian term, and, on average, 50.2% of the total number of the English terms was translated with an anglicism.

Such an outcome can be related to the design of the study in several ways. Under different circumstances and using a questionnaire formulated in another manner, the results indicating a significant influence of English on dental students' vocabulary could have been different.

First, the English sentences that had been offered for translation were formulated in a way as to include the English terms that could be translated with the Croatian terms that share the same word stem. We deliberately offered such terms in order to assess the students' readiness to use the word form which had been "served" to them instead of taking the time to think of the appropriate Croatian term.

Considering that the students probably assumed that their questionnaires would be read by another professional (e.g. the person who asked them to complete the questionnaire), and considering the circumstances in which the study was conducted (we were taking time from the students' regular lectures), it is likely that the students were translating the sentences more or less "automatically", without thinking too long about which word to use. In other words, the results of the study could suggest that most dental students did not primarily focus on the

choice of proper Croatian terms, but rather on simply offering a correct translation of the English sentences or a translation the primary purpose of which was to be understandable to the reader. Choosing an anglicism used in Croatian for the English term was the easiest way to achieve these purposes. However, the question H, concerning the use of Croatian terms in the communication with patients, which had been deliberately placed at the very end of the questionnaire, brought students in the position to question their choices. The finding that only 23.9% of students gave a positive answer or answered with *mainly yes* suggests that students are aware that a considerable portion of their discourse includes domain-specific terms that could be misinterpreted or incomprehensible to a layperson. Had the question H (in a somewhat different form) been asked prior to the part of the questionnaire that requested the translation of the sentences, it is likely that the students would pay more attention to their choices and would, possibly, choose Croatian terms more often.

These results suggest that students are aware that they have to pay attention to the way they communicate with their patients. On the other hand, the results could suggest that less attention is given to the choice of vocabulary in professional communication since the word choice does not have a negative impact on mutual understanding. A large number of linguists define discourse as a process of social interaction, considering the linguistic act just a part of it (Graddol et al. 1994). In professional communication, priority could thus be given to achieving fast exchange of turns, language efficiency and in-group identification (Matić 2014). Matić (2014) has shown that computer science students perceive English ICT terminology as a more practical tool in oral communication for those who strive for these goals. In addition, her students also declared a high level of agreement with the suggestion that accepting English terms will increase and improve the knowledge of English in users. Thus, the dental students in our study could also have been guided by a wish for a quick and efficient task completion (achieving the maximum effect for the minimum effort). Herein, anglicisms are unlikely to be considered a threat to the national language (*language of identification*) but rather as a complementary possibility of communication (*language of communication*) (House 2005). In addition, dental students are also, to a great extent, exposed to the language of computer sciences which includes many anglicisms. It could be hypothesised that their permanent exposure to anglicisms, which are often not even orthographically adjusted, such as *lajkati*, *inbox*, *downloadati* or *forwardirati* influences their readiness to accept and use medical loanwords instead of Croatian equivalents.

It is also reasonable to assume that dental students get so used to many terms they use on a daily basis that they begin to consider them as common knowledge. This could attenuate their ability to distinguish medical/dental terms that are from

those that are not understandable to a layperson. Alertness about this problem is necessary because many patients are unwilling to admit that they have literacy problems (Safeer and Keenan 2005) and are reluctant to pose questions to their physicians (Katz et al. 2007). If doctors use inappropriate, specialized terminology in the communication with patients, this could draw them even further from seeking clarification.

The fact that the English terms were offered for translation in sentences, and not as noncontextualized selfstanding items probably also affected the way they were translated. Had the English terms been given without the context, it is possible that they would have been translated with appropriate Croatian terms more often (because, perhaps, a term more adapted to the Croatian standard language would be perceived as a “more correct” way to translate the English equivalent). The use of English terms in sentences is probably the main reason why some of the translations, primarily those of adjectives (e.g. *dental*), were often omitted. Their presence was likely considered unnecessary for the understanding of the subject matter.

A finding that a Croatian term in parenthesis was added to 2.4% of the translations with an anglicism as a clarification might indicate the awareness that terms commonly used among dentists belong to a specific register and might not be generally understood. However, it is reasonable to suspect that in a number of these cases the addition of the appropriate Croatian term was related to the probability that the students “sensed” the purpose of the survey as they approached the end of the questionnaire, especially after answering the question H. This suspicion is based on the fact that the Croatian term was often added to the anglicism used aside from the rest of the sentence, above or beneath the concerned term. By adding it, students probably wanted to make sure their translation would be correct and understandable to everybody.

It should also be noted that in a number of cases the students began writing anglicisms, but changed their mind before ending the word, fretted it, and wrote the Croatian term. This confirms that the use of standard Croatian language requires (some) attention and effort, especially in the cases when foreign words can be “translated literally” so the selection of an anglicism is the easiest and quickest way to accept the information (or, in the case of this survey, “complete the task”).

Even though the self-assessed knowledge of the English language was very good, the results of the survey suggest that dental students distinctly prefer professional literature in Croatian. This finding is consistent with what the head of the Central Dental Library answered when asked about the use of foreign literature among undergraduate students. She informed us that students rarely borrow literature in English, i.e. mainly if there is nothing available in Croatian on the subject of interest.

These results suggest that Croatian medical and dental teachers could play a major role in the modelling of the professional language of their students. A study by Bogunović and Čoso (2013) revealed a significant influence of the English language on the Croatian scientific medical discourse. The results of their corpus-based study, which included four Croatian scientific journals (including *Acta Stomatologica Croatica*) indicated that the influence of English is most evident on the lexical level. One third of the sentences from the introductory part of 94 analysed articles contained anglicisms which do have an established Croatian equivalent, and 1.55% of all words were anglicisms. The authors explain this finding with the fact that writing scientific and/or professional articles is tied to a time-consuming process of reading domestic and foreign publications in the field of research, wherein the number of papers in English greatly exceeds the number of papers in Croatian. This assumption is in accordance with the statement by Navarro and Hernández (1994) that a high rate of anglicisms and false friends in Spanish medical texts is to a great extent that high due to the fact that most Spanish publications are based on English bibliography. In this process many terms are adopted into one's vocabulary uncritically (unnecessarily) and with more or less adjustment to the standard Croatian language. Some of them are left untranslated such as *power bleaching*, *in office bleaching*, *crown down* and *step back* technique. Borrowing of English terms as such, without any attempt to create or to use a native equivalent is also present in other languages, such as Hungarian. Németh (2004) mentions several reasons why English terms or combined English-Hungarian terms could be used instead of full Hungarian translations: the willingness to use short terms, the English words being more accurate (less connotative), and professional snobbishness. These reasons play a role in the adoption of anglicisms in other languages as well. The professors of Croatian medical/dental schools should be aware of this when acting as translators of textbooks, authors of textbooks and other educational materials, as well as teachers in the lecture rooms.

The finding that a majority of students (69.1%) think it is justified to use the words of foreign origin even if there are Croatian equivalents (question E) might reflect the attitude that one does not need to worry or trouble oneself with the choice of Croatian terms as long as mutual understanding in the conversation is achieved. However, a general attitude that language is only a tool of communication does not favour the preservation of the native (professional) language. Navarro and Hernández (1994) denounce those who consider language a mere means of communication in the field of science, who do not care about the intrusion of unnecessary anglicisms, and who disregard the cultural value of languages.

This finding might also reflect the students' "feeling" or attitude that many professional terms they use in daily practice are widely known. Studies suggesting that many commonly used medical terms are often misinterpreted by patients,

and which accentuate the necessity of working on the strategies for communicating with patients refute this (Gibbs et al. 1987; Alexander 1999, 2000; Lerner et al. 2000; Safeer and Keenan 2005; Katz et al. 2007; Jackson and Eckert 2008; Patel et al. 2011; Rozier et al. 2011; O'Connell et al. 2013; Maybury et al. 2013; Stein et al. 2014). Still, it can be expected that some loanwords (such as *pacemaker* or *stent*) became ingrained in the Croatian language and could in fact be more familiar to the general population than their Croatian equivalents (Gjuran Cocha 2011). Vrdelja's study (2011) also demonstrates that some anglicisms and constructions that follow the rules of English are often not recognized and are seen as a part of the Croatian standard language. However, it can be questioned why and how the words which can be considered a part of a medical terminology or jargon entered the public discourse and became widely used (or, so to say, popular) instead of their Croatian equivalents (where appropriate Croatian alternatives exist). This process might be similar (but not as intense) to the transition of the usage of ICT terms in closed groups of experts into nearly everyman's vocabulary (Mihaljević 2003). The answer to that question could lie, at least partly, in that the first contact with the family physician as a source of health related information is slowly being replaced, in many cases, by the contact with the internet (Sartori 2013).

This finding might also reflect the attitudes of a part of the general public that describes the influence of English on certain domains of the native language as natural and inevitable, emphasizing the practical advantages of adopting words from English (Hyrkstedt and Kalaja 1998). In other words, dental students might perceive English as a language of science and accept anglicisms as scientific terms (Drljača Margić 2012). The integration of anglicisms into professional vocabulary may thus be considered as a natural part of their professional development and, perhaps, perceived as a sign of a better education and prestige.

The above finding is in accordance with the percentage of only 18.9% of the students who answered *yes* or *mainly yes* to the question G about the use of Croatian terms instead of the established loanwords, and the statistical analysis showed their significant negative correlation. This finding is also congruent with the one of Jakovac et al. (2013) who, within the project Hranafina, investigated the perceptions and attitudes of 249 medical students of the School of Medicine in Rijeka about the Croatian medical terminology. In their survey, 74% of the students declared that the already widely accepted anglicized medical terms should not be replaced by croatized terminology. The principal reason for gaining the described results could be an insufficient use and popularization of the Croatian equivalents of English terms, primarily in medical and dental schools. A majority of their students, 87%, considered that it is necessary to standardize the Croatian medical terminology and only 4.9% of them were, at the time, familiar with Struna. A study by Drljača Margić (2012), which tested the Croatian university students'

attitudes toward the use of anglicisms in different domains also indicated that half of the students who favoured the use of anglicisms in the domain of science had positive attitudes toward the establishment of terminology committees, groups of linguists and scientists responsible for creating and popularizing native tongue replacements for English loanwords.

A significant, but positive correlation was found between the answers to the questions G and F (Important to create and use Croatian professional words) and between the answers to the questions E and F. All of the mentioned significant correlations indicate a consistency in the students' attitudes; a smaller number of them consistently favoured the Croatian terms to loanwords and others did not find it necessary to change their terminology for a more Croatized one. However, no significant association was found between the students' attitudes reflected through their answers and their preference to Croatian terms or anglicisms. Thus, if explicitly asked, students can declare their attitude toward the use of Croatian words in relation to loanwords in dental medicine but their attitudes could be at odds with the terms they actually use regularly. This again may indicate that most students, regardless of their attitudes, mostly use the words that they had become accustomed to during their studies. These results are in accordance with the finding that the respondents of the study by Drljača Margić (2014, 80), "like most people, tend to see the loanwords they use as more necessary and appropriate than the loanwords other people use".

The results from Table 2 as well as certain calculations of Cohen's kappa suggest, not unexpectedly, that some of the offered English terms were almost exclusively translated with Croatian terms, and some were almost always translated with anglicisms. For example, the terms *temporomandibular joints*, *alveola*, *temporal bones* or *caries* were relatively rarely translated with the Croatian terms. On the other hand, the terms *deglutition*, *mastication* or *gastric* were mostly translated with the Croatian terms. This also implies that certain terms are more rooted in their international forms in the students' dental vocabulary than others. Such terms are more likely to become wrongly perceived as common knowledge and thus more often used in inappropriate circumstances, as in the communication with patients.

In summary, the results of this study showed that Croatian dental students preferentially translated terms in English with anglicisms instead of Croatian terms adapted to the norms of the standard Croatian language. Under the circumstances of this study, this could suggest that their main goal was to achieve mutual understanding, with less attention given to the choice of the terms. The results of the survey also suggest a versatility in the use of medical/dental terminology among dental students (i.e. the familiarity with professional terms gained in the course of their studies could subconsciously determine the students' choice of the

word used for the translation of a specific English term), and a notable resistance toward the replacement of foreign words with Croatian equivalents. The survey also showed that most students rarely use foreign literature during their studies, and that they distinctively prefer literature in Croatian. This suggests that the formation of their professional vocabulary is mostly influenced by the Croatian terminology used in textbooks and other educational materials, as well as the lectures they attend during the course of their study.

## 5. Limitations

The results of this study have been interpreted within the limits of the study design. They describe the students' word preferences under the circumstances of the study and cannot be generalized as their common preferences. A more comprehensive insight into the factors which model the students' professional vocabulary could be gained through the studies analysing the terminology used by teachers in their educational activities and the prevalent word forms in the students' textbooks and scripts in Croatian. A reasonable assumption that the students preferred anglicisms because it would not impede understanding in this context cannot be supported by conclusive evidence. The significance of the results for a dental practitioner would be greater if a properly designed study would confirm the assumption that most medical/dental terms resembling English are more difficult to understand (i.e. less transparent) for a patient than the existing Croatian terms. Therefore, the next section of the paper brings forward mostly our opinions and recommendations based on the results of this particular study.

## 6. Conclusions and implications

The influence of English on the Croatian medical/dental terminology cannot be avoided. Exaggerated linguistic purism which would oppose lexical borrowing is just as unacceptable as the uncritical acceptance of loanwords without reflecting on the possibilities of the native language to fill in the lexical gaps (Lipanić and Ujdur 2008). Thus, loanwords properly adjusted to the norms of the Croatian language should be a part of the field-specific vocabulary and their use should not be suppressed, especially if they draw their origins from Greek or Latin and are, as such, traditionally and internationally used. However, fostering the acquisition and use of Croatian terms helps to preserve the national professional language. In professions such as medicine and dental medicine, a careful selection of

Croatian equivalents to medical terms and phrases is also the basis for the process of learning how to better communicate with patients.

The teachers at Croatian medical/dental schools, willingly or not, hold a great responsibility for cherishing and developing the Croatian terminology of their field, and for passing the attitudes on this matter on to younger generations. Caring about the professional language is particularly important if learning communication techniques and communication skill training are not a specified, distinctive part of a dental curriculum. In practising the skill of transferring the medical information in the most appropriate way, as well as in the process of translating and/or writing medical/dental textbooks and other educational materials, the Struna database could be of much help. Though incomplete, it recommends appropriate Croatian terms for several thousand anatomical and physiological terms and terms more closely related to dental medicine, denoting their synonyms as allowed, not recommended, jargon or archaic. In this way, Struna can significantly contribute to the consistent and unambiguous usage of specified Croatian terms in speech and writing, and can help resist the unselective entry of (improperly translated) loanwords into Croatian professional terminology. By offering Croatian term equivalents in foreign languages, Struna could also increase the quality of scientific work and facilitate the publication of scientific results of Croatian scientists in international publications.

The time of formal education is an important phase in the process of gaining behavioral competencies in the patient care environment, including the training in communication skills which should not be neglected after graduation. Dentists could be assisted in these efforts by a development and dissemination of communication guidelines for dental care professionals (Rozier et al. 2011). With regard to this suggestion, a series of four motivating and instructive articles named "Little school of Croatian for dentists" was published in the herald of the Croatian Dental Chamber (2006: 13(1–4)) even before the project Hrston began. Each article shortly discussed general or more specific linguistic issues relating to dental medicine and by recommending more than 20 Croatian terms for commonly used loanwords fostered their use in communication with both colleagues and patients.

The way in which Croatian medical/dental terminology can be further enriched is by proposing Croatian neologisms for new diagnostic or therapeutic methods, surgical procedures, and the like. In order to preserve and improve the national professional language, this is a necessity, and the moment a certain term enters the Croatian language is indeed the right moment for its proper translation and implementation. If created with a significant delay, Croatian equivalents are more likely to be perceived as forced and imposed (Drljača Margić 2014; Gjuran Coho 2011). In this, the teaching staff of higher educational institutions again plays a significant role. For instance, several examples of needless use of loanwords,

improperly translated dental terms, and untranslated English terms can, at this time, be found on the invitations for the courses of continuous education of dental practitioners organized by our School. By giving advantage to an untranslated foreign word (instead of a Croatian equivalent or, when applicable, a loanword which has been adopted into the Croatian linguistic system and phonetized), one sends a message about the linguistic prestige of the English language over Croatian and about linguistic conformity (Josić 2014).

Though many activities have already been conducted to promote a continuous care about the national (professional) language, the terminological projects of our dental school and the Struna database among health professionals, medical/dental students, scientists, as well as translators and other nonmedical experts who use the medical/dental terminology in their work, the results of this survey encourage further activities on the popularization and development of the Croatian professional terminology. The principles on which the projects of Struna were carried out, including the multidisciplinary approach and professional support, can be used in other contexts and languages.

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## References

- Alcaraz Ariza, María Á. 2012. "The English of the Health Sciences: A Note on Foreign Borrowings." *The ESPECIALIST* 33 (1): 67–90.
- Alexander, Roger E. 1999. "Patient Understanding of Postsurgical Instruction Forms." *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 87 (2): 153–158. doi: 10.1016/S1079-2104(99)70265-9
- Alexander, Roger E. 2000. "Readability of Published Dental Educational Materials." *Journal of the American Dental Association* 131 (7): 937–942. doi: 10.14219/jada.archive.2000.0312
- Amundson Romich, Janet. 2001. "Understanding Basic Medical Terminology." In *Linguistics at Work. A Reader of Applications*, ed. by Dallin D. Oaks, 122–128. Cambridge, MA: Heinle & Heinle Publishers.
- Bratanić, Maja, and Ivana Brač. 2013. "Building a Croatian National Termbank: Can a Single Solution Fulfil All Our Responsibilities?" Paper presented at the *6th Terminology Summit*, Oslo.
- Bratanić, Maja, and Ana Ostroški Anić. 2013. "The Croatian National Termbank STRUNA: A New Platform for Terminological Work." *Collegium Antropologicum* 37 (3): 677–683.

- Bogunović, Irena, and Bojana Čoso. 2013. "Engleski u hrvatskome: znanstveni izričaj biomedicine i zdravstva [English in Croatian scientific medical discourse: a corpus-based study]." *Fluminensia* 25 (2): 177–191.
- Carli, Augusto, and Emilia Calaresu. 2003. "Le lingue della comunicazione scientifica. La produzione e la diffusione del sapere specialistico in Italia [The Languages of Scientific Communication. The Production and Dissemination of Specialized Knowledge in Italy]." In *Ecologia linguistica. Atti del XXXVI Congresso Internazionale di Studi della Società di Linguistica Italiana (SLI 47)*, ed. by Ada Valentini, Piera Molinelli, Pierluigi Cuzzolin and Giuliano Bernini, 27–74. Roma: Bulzoni.
- Drljača Margić, Branka. 2010. "Engleski u hrvatskome: stavovi i uporaba [English in Croatian: Attitudes and Use]." Doctoral thesis, University of Zagreb.
- Drljača Margić, Branka. 2011. "The (Missing) Role of the Media in the Popularization of Croatian Equivalents to Anglicisms." Paper presented at the *4th International Language in the Media Conference*, Limerick.
- Drljača Margić, Branka. 2012. "Croatian University Students' Perception of Stylistic and Domain-based Differences Between Anglicisms and Their Native Equivalents." In *Languages, Literatures and Cultures in Contact: English and American Studies in the Age of Global Communication, Vol. 2: Language and Culture*, ed. by Marta Dąbrowska, Justyna Lesniewska and Beata Piątek, 109–126. Krakow: Tertium.
- Drljača Margić, Branka. 2014. "Contemporary English Influence on Croatian: A University Students' Perspective." In *Language Contact Around the Globe. Proceedings of the LCTG3 Conference*, ed. by Amei Koll-Stobbe and Sebastian Knospe, 73–92. Frankfurt am Main, Berlin, Bern, Bruxelles, New York, Oxford, Wien: Peter Lang.
- Gibbs, Richard D., Patricia H. Gibbs, and Joseph Henrich. 1987. "Patient Understanding of Commonly Used Medical Vocabulary." *Journal of Family Practice* 25 (2): 176–178.
- Gjuran Coha, Anamarija. 2011. "Terminologizacija jezika medicinske struke [Standardization of medical language]." *Medicina Fluminensis* 47 (1): 4–14.
- Graddol, David, Jenny Cheshire, and Joan Swann. 1994. *Describing Language*. Philadelphia: Open University Press.
- House, Juliane. 2005. "Englisch als 'Lingua Franca'. Eine Bedrohung für die deutsche Sprache? [English as a 'Lingua Franca'. A Threat to the German Language?]." In *Englisch oder Deutsch in internationalen Studiengängen?*, ed. by Markus Motz, 53–65. Frankfurt am Main, Berlin, Bern, Bruxelles, New York, Oxford, Wien: Peter Lang.
- Hyrkstedt, Irene, and Paula Kalaja. 1998. "Attitudes Toward English and Its Functions in Finland: A Discourse-analytic Study." *World Englishes* 17 (3): 345–357. doi: 10.1111/1467-971X.00108
- Jackson, Richard D., and George J. Eckert. 2008. "Health Literacy in an Adult Dental Research Population: A Pilot Study." *Journal of Public Health Dentistry* 68 (4): 196–200. doi: 10.1111/j.1752-7325.2007.00063.x
- Jakovac, Hrvoje, Tanja Grubić Kezele, Maja Valić, Zoran Valić, Sunčana Kukulja Taradi, and Marin Vodanović. 2013. "Balancing Language Imbalances in Physiological Terminology." *Periodicum biologorum* 115: 30.
- Josić, Ljubica. 2014. "Uncritical Acceptance of the English-Language Influence on Croatian Web Portals as a Problem of Media Literacy." *Medijska istraživanja* 20 (2): 155–174.
- Katz, Marra G., Terry A. Jacobson, Emir Veledar, and Sunil Kripalani. 2007. "Patient Literacy and Question-Asking Behavior During the Medical Encounter: A Mixed-Methods Analysis." *Journal of General Internal Medicine* 22 (6): 782–786. doi: 10.1007/s11606-007-0184-6

- Kontra, Miklós. 1982. "Medical Languages in Contact: English and Hungarian." *Angol Filológiai Tanulmányok / Hungarian Studies in English* 15: 75–89.
- Kovács, Eva. 2009. "Anglizismen im Deutschen: eine Gefahr oder eine natürliche Erscheinung? [Anglicisms in German: A Danger or a Natural Phenomenon?]." In *Germanistische Studien VII*, ed. by Mihály Harsányi and René Kegelmann, 181–190. Eger: Linceum Kiadó.
- Lerner, Brooke E., Dietrich V. K. Jehle, David M. Janicke, and Ronald M. Moscati. 2000. "Medical Communication: Do Our Patients Understand?" *American Journal of Emergency Medicine* 18 (7): 764–766. doi: 10.1053/ajem.2000.18040
- Liermann-Zeljak, Yvonne. 2013. "Anglicisms in Electrical Engineering Terminology." *International Journal of Electrical and Computer Engineering Systems* 4 (2): 43–53.
- Lipanić, Dijana, and Regina Ujdur. 2008. "Zaključci Vijeća za normu hrvatskoga standardnoga jezika [Conclusions of the Council for Standard Croatian Language Norm]." *Vjesnik Društva profesora hrvatskoga jezika* 2: 3–5.
- Matić, Daniela. 2014. "Attitudes of Computer Science Students to the English Element in Croatian ICT Magazines." *ESP Today* 2 (2): 174–198.
- Maybury, Catherine, Alice M. Horowitz, Min Qi Wang, and Dushanka V. Kleinman. 2013. "Use of Communication Techniques by Maryland Dentists." *Journal of the American Dental Association* 144 (12): 1386–1396. doi: 10.14219/jada.archive.2013.0075
- Mihaljević, Milica. 2003. *Kako se na hrvatskome kaže WWW? Kroatistički pogled na svijet računala* [What is WWW called in Croatian? A Croatian studies view on the computer world]. Zagreb: Hrvatska sveučilišna naklada.
- Myhre, Kristin. 2011. "Exchange Students Crossing Language Boundaries in Clinical Nursing Practice." *International Nursing Review* 58 (4): 428–433. doi: 10.1111/j.1466-7657.2011.00904.x
- Nagy, Imola K. 2013. "The History, Peculiar Terminology and Translation Problems of the Language of Medicine." In *The Proceedings of the International Conference Literature, Discourse and Multicultural Dialogue. Section: Language and Discourse*, ed. by Iulian Boldea, 179–189. Tirgu-Mureș: Arhipelag XXI Press.
- Navarro, Fernando A., and Francisco Hernández. 1994. "Nuevo listado de palabras de traducción engañosa en el inglés médico [New List of Words with Misleading Translation in Medical English]." *Medicina Clínica Barcelona* 102: 142–149.
- Németh, Éva. 2004. "Magyarul nem megy? Anglicizmusok a magyar orvosi nyelvben [Hungarian doesn't Work? Anglicisms in the Hungarian Medical Language]." *Lege Artis Medicinae* 14 (12): 822–824.
- Nikolić-Hoyt, Anja. 2005. "Hrvatski u dodiru s engleskim jezikom [Croatian in contact with English]." In *Hrvatski jezik u dodiru s europskim jezicima. Prilagodba posuđenica*, ed. by Lelija Sočanac, 179–205. Zagreb: Nakladni zavod Globus.
- O'Connell, Rachel Louise, Sidonie K. Hartridge-Lambert, Nizar Din, Edward Robert St. John, Charlotte Hitchins, and Tayo Johnson. 2013. "Patients' Understanding of Medical Terminology Used in the Breast Clinic." *Breast* 22 (5): 836–838. doi: 10.1016/j.breast.2013.02.019
- Onysko, Alexander. 2007. *Anglicisms in German: Borrowing, Lexical Productivity, and Written Codeswitching*. Berlin: Walter de Gruyter. doi: 10.1515/9783110912173
- Opačić, Nives. 2006. "Mediji i hrvatski standardni jezik [Media and the Croatian Standard Language]." In *Jezik i mediji – jedan jezik: više svjetova. Zbornik*, ed. by Jagoda Granić, 521–532. Zagreb-Split: Hrvatsko društvo za primijenjenu lingvistiku.

- Patel, Priti P., Ian C. Hoppe, Naveen K. Ahuja, and Frank S. Ciminello. 2011. "Analysis of Comprehensibility of Patient Information Regarding Complex Craniofacial Conditions." *Journal of Craniofacial Surgery* 22 (4): 1179–1182. doi: 10.1097/SCS.0b013e31821c00e4
- Perković, Anica, Alka Turalija, Maja Lucijanić, and Marin Takalić. 2014. "English Borrowings in the Croatian Sustainable Agriculture Terminology." *Agriculture – Science and Practice* 3–4 (91–92): 151–158.
- Picone, Michael D. 1996. *Anglicisms, Neologisms and Dynamic French*. Amsterdam: John Benjamins. doi: 10.1075/lis.18
- Ricart Vayá, Alicia, and Miguel Á. Candel Mora. 2009. "Emerging Vocabulary: The Influence of English on Medical Spanish." *Revista Alicantina de Estudios Ingleses* 22: 327–340. doi: 10.14198/raei.2009.22.19
- Rozier, Gary R., Alice M. Horowitz, and Gary Podschun. 2011. "Dentist-patient Communication Techniques Used in the United States: The Results of a National Survey." *Journal of the American Dental Association* 142 (5): 518–530. doi: 10.14219/jada.archive.2011.0222
- Safeer, Richard S., and Jann Keenan. 2005. "Health Literacy: The Gap Between Physicians and Patients." *American Family Physician* 72 (3): 463–468.
- Sartori, Monica. 2013. "Excuse Me, What Does It Mean?" A Socio-Linguistic Analysis of Patient Information Leaflets in Doctor-Patient Interactions." Master thesis, University of Padua.
- Stein, Pamela S., Joanna A. Aalboe, Matthew W. Savage, and Allison M. Scott. 2014. "Strategies for Communicating with Older Dental Patients." *Journal of the American Dental Association* 145 (2): 159–164. doi: 10.14219/jada.2013.28
- Šabec, Nada. 2005. "Slovene-English Language Contact: Lexical, Syntactic, Pragmatic and Intercultural Aspects." In *Jezik u društvenoj interakciji. Zbornik radova sa savjetovanja održanoga 16. i 17. svibnja u Opatiji*, ed. by Diana Stolac, Nada Ivanetić and Boris Pritchard, 471–481. Zagreb-Rijeka: Hrvatsko društvo za primijenjenu lingvistiku.
- Vrdelja, Kristina. 2011. "Social Attitudes Towards the Borrowings from the English Language into the Croatian Language." Diploma thesis, University of Zagreb.
- Zauberger, Ieva. 2005. "Handling Terminology in Translation." In *New Trends in Translation Studies*, ed. by Krisztina Károly and Ágota Fóris, 107–116. Budapest: Akadémiai Kiadó.

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**Lea Vuletić** is assistant professor at the Department of Physiology of the School of Dental Medicine, University of Zagreb. Current fields of her scientific interest include oral physiology, clinically oriented teaching of human physiology and professional terminology.

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**Kristina Peroš** is a manager of the project Croatian pharmacological terminology supported by Croatian Science Foundation. She is the author of scientific and professional publications in the fields of pharmacology, oral sciences, dental education and medical terminology. She is head of the Department of Pharmacology of the School of Dental Medicine, University of Zagreb.

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**Marin Vodanović** was a project manager and main researcher at two interinstitutional projects about professional terminology in dental medicine, human anatomy and physiology supported by Croatian Science Foundation. He is the author of more than 200 publications including seven books and dictionaries. He serves as vice dean for Postgraduate Specialist University Study and is head of the Department of Dental Anthropology of the School of Dental Medicine, University of Zagreb.