Who is Sharpest at Looking Up *sharp*? Comparing Two Parallel Groups of Dictionary Users

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Abstract: This article is a comparison of two previous research studies (Farina et al. 2019; Vrbinc et al. in press), both of which examined the dictionary look-up behaviors of two very different cohorts of undergraduate students from the University of Ljubljana, Slovenia. At the time the two original and parallel look-up studies were carried out, one cohort was majoring in business and economics in the School of Economics and Business and the other was majoring in English in the Faculty of Arts. The previously published work reports on how, in both groups, participants were given nine contexts containing a clearly marked common English word used in an infrequent and often unknown sense; they had to locate the relevant sense related to a given context in an unknown-to-them learner's dictionary, *The Britannica Dictionary*. The participants were asked to think aloud as they looked up words; the researchers observed and recorded their approaches and problems. Prior to, during, and after the look-up process, the members of these two cohorts responded to fourteen questions about their habits of dictionary use and their perceptions of the utility and quality of definitions and illustrative examples that they encountered. This article contrasting the two studies indicates that the look-up proficiency of the two groups differed significantly.

Keywords: DICTIONARY USER, ADVANCED ENGLISH LEARNER, LEARNER'S DICTIONARY, DICTIONARY AWARENESS, LOOK-UP BEHAVIOR, QUALITY OF DEFINITION, QUALITY OF EXAMPLES

Opsomming: Wie is die skerpsinnigste in die naslaan van *skerp*? Die vergelyking van twee parallelle groepe woordeboekgebruikers. Hierdie artikel is 'n vergelyking van twee vorige navorsingstudies (Farina et al. 2019; Vrbinc et al. ter perse) waarin die woordeboeknaslaangedrag van twee heeltemal verskillende groepe voorgraadse studente van die

Universiteit van Ljubljana, Slowenië ondersoek is. Ten tyde van die uitvoer van die twee oorspronklike en parallelle woordeboeknaslaanstudies het een groep studente in besigheidstudies en ekonomie aan die Ekonomie- en Sakeskool gespesialiseer en die ander groep in Engels aan die Fakulteit Lettere. Die voorheen gepubliseerde studies doen verslag oor hoe, in beide groepe, aan deelnemers nege kontekste gegee is wat 'n duidelik gemerkte algemene Engelse woord wat in 'n ongewone en dikwels onbekende betekenis gebruik is, bevat; hulle moes die relevante betekenis binne 'n gegewe konteks in 'n aanleerderswoordeboek wat onbekend aan hulle was, *The Britannica Dictionary*, bepaal. Die deelnemers is gevra om hardop te dink terwyl hulle woorde naslaan; die navorsers het hul benaderings en probleme waargeneem en aangeteken. Voor, tydens en ná die naslaanproses het die lede van die twee groepe veertien vrae oor hul woordeboekgebruiksgewoontes en waarnemings van die bruikbaarheid en kwaliteit van definisies en illustratiewe voorbeelde wat hulle teëgekom het, beantwoord. Hierdie artikel waarin die twee studies gekontrasteer word, dui daarop dat die naslaanvaardighede van die twee groepe beduidend van mekaar verskil.

Sleutelwoorde: WOORDEBOEKGEBRUIKER, GEVORDERDE AANLEERDER VAN ENGELS, AANLEERDERSWOORDEBOEK, WOORDEBOEKBEWUSTHEID, NASLAANGEDRAG, KWALITEIT VAN DEFINISIE, KWALITEIT VAN VOORBEELDE

1. Introduction

Lexicographers usually cater to an audience with education, but one that does not think extensively about the finer points of a language. Lexicographic works are normally consulted by such an audience for utilitarian purposes and no more (see Béjoint 2010). Most educated users want what they want from a dictionary; they want to get what they want quickly and move forward. Possibly the greatest challenge for a lexicographer is to produce an online reference work that is easy to use for the general educated public; using this reference work should not demand an extensive understanding of language or linguistics. But then we must ask: Just how different is the general educated user from a user who is closer in training to an actual lexicographer? How much better would a language specialist perform in dictionary look-up tasks as compared to other educated users who do not specialize in language or linguistics?

This article is an effort to discover answers to such questions. It compares the results of two parallel studies (Farina et al. 2019; Vrbinc et al. in press), both of which used an identical methodology to examine the look-up process of online learner's dictionary users. These qualitative studies, carried out in March 2018 at the University of Ljubljana, were the first to directly investigate the behaviors of advanced learners of English/dictionary users in Slovenia, and were a joint project between the United States and Slovenia (see Acknowledgements). The studies had two different sets of undergraduate participants. The first cohort, nine third-year students from the School of Economics and Business (FE[1]), were majoring in different areas of business and economics and were not specialists in English. The second cohort, eight third-year undergraduate majors from the

Department of English Philology in the Faculty of Arts (FA), were preparing as specialists in the English language. While the business/economics majors were competent English users, they were not inordinately interested in the English language per se; on the other hand, the English majors had both a deep interest in English and extensive experience in the use of dictionaries. The look-up process of both studies refers to the numerous simultaneous actions taken by the users as they scanned a dictionary (in this case, online) for specific information. In the present work, the FE and the FA students are being compared, to discern how their practices in using an online learner's dictionary differ.

The two cohorts of the parallel studies were asked to read nine contexts, each containing a clearly marked, well-known English word used in an infrequent sense; they had to search for the correct, relevant meaning among all senses of the word in a learner's dictionary, *The Britannica Dictionary* (BD). When the two studies were conducted, this dictionary was titled the *Merriam-Webster Learner's Dictionary.* At the time of writing, it has been rebranded by Encyclopaedia Britannica, Inc. as the BD.[2] Typologically this dictionary is a work appearing in both print (2008 and 2016) and online forms, the second category in Rundell (2015: 305), with the digital dictionary derived from the print versions. The BD was completely unknown to the participants.

As was outlined in Farina et al. (2019) and Vrbinc et al. (in press), the two parallel studies being compared here do not share characteristics with many previous studies gaging the habits of dictionary users. We did not investigate *how* users access dictionaries as did Lew (2011) and Lorentzen and Theilgaard (2012); we presented students immediately with the online learner's dictionary, the BD, that we expected them to use. We did not compare students' use of several different dictionaries, as in De Schryver and Prinsloo (2011) or Herbst (1996). While neither study sought to investigate design or presentation of information in an online learner's dictionary (cf. Gouws 2014; Lew and De Schryver 2014), the results contrasted here indicate that for only one of the two cohorts did format turn out to be significant. Two older studies have elements in common with the parallel studies. Mitchell (1983) discussed how children use contexts and locate related information in monolingual dictionaries; while the age of the informants is different (younger) and the (print) dictionaries used were for native speakers, there were some commonalities with the findings of the parallel studies. Tono (1984) looked at how long users were willing to read down through an entry before they would essentially give up and accept the closest information found. The investigation presented here contrasts differences in how the two parallel cohorts responded when information was located far down in an entry and required prolonged online scrolling.[3]

2.   Methodology

This section describes two separate methodologies. First, the uniform methodology of the two original, parallel studies is described, albeit more briefly than

in Farina et al. (2019) and Vrbinc et al. (in press). Second, the methodology followed for the present comparison of the two parallel studies is provided.

2.1   Set-up of the two parallel studies

Ahead of dictionary consultation in both parallel studies, the researchers selected nine contexts for the participants to read, to be used as the drivers of their dictionary look-up of targeted words. Seven contexts were taken from an American newspaper and two from texts of American non-fiction and American fiction (see Appendix A: List of Contexts and Their References). Within each context appears an underlined, boldfaced word of standard English, not used in its most common sense but in an infrequent sense. During both studies, the participants were first asked general questions about their dictionary-use habits, as well as a few additional questions. Next, each participant began to read the contexts, one at a time. After reading a context, they began to look up the target word's meaning in the online BD. We observed the participants while they were looking up the meaning in both studies; the participants also discussed aloud what they were doing during look-up and answered both scripted and other questions. Our roles in both parallel studies were to ask questions, closely observe participant behaviors throughout, and take notes.

2.1.1   Dictionary used in the two studies

As noted above, the dictionary used was *The Britannica Dictionary* (BD), rebranded from the online *Merriam-Webster Learner's Dictionary*. While Encyclopaedia Britannica, Inc. has removed the mention of "learner's" from the current title, during the parallel studies participants were quite aware that the dictionary is intended for English learners. This is not a dictionary that is familiar to university students in Slovenia; no participant in the parallel studies had ever used it.

2.1.2   Study participants, their English proficiency, and their expertise in English

For the parallel studies, eighteen volunteers were recruited from among students in the School of Economics and Business (FE) and the Faculty of Arts (FA) at the University of Ljubljana; one student from the FA dropped out, leaving a total of 17 participants, with nine persons volunteering from the FE and eight from the FA. All persons in both groups were advanced English users. We estimate that at the time of the study, the FE students were at the C1 level and some may have been at the C2 level in the Common European Framework of Reference for Languages (CEFR), or at the Advanced High or Superior level in the proficiency scale of the American Council on the Teaching of Foreign Lan-

guages (ACTFL) (*Učni načrt Angleščina* 2008; *Assigning CEFR Ratings to ACTFL Assessments* n.d.). We estimate that at the time of the study, the FA students were very near to or had already achieved the C2 level in the CEFR or the Superior level in ACTFL (*Učni načrt Angleščina* 2008; *Assigning CEFR Ratings to ACTFL Assessments* n.d.).[4]

While the respective valid and reliable proficiency scales of the U.S. and Europe paint part of the picture about knowledge of a language, they do not fully capture the linguistic knowledge of grammar or experience with nuances of language. When such factors are taken into consideration, it is clear that the FA study participants have skills and experience with English that, even if they cannot yet be called "professional-level," they are moving in that direction. As almost-English-language professionals, the FA participants had a skill set that distinguished them from the general users of English in the FE. As will become clear here, this almost-professional skill set impacted positively the FA performance in dictionary look-up. As is discussed below, while all participants from both studies were proficient speakers and readers of English, the FAs (and not the FEs) stood out as atypical dictionary users with an avid interest in lexicographic products.

2.1.3   Target words and target contexts for the parallel studies

In the two parallel studies, the targeted words, in context, in an infrequent sense, were selected to push the students to demonstrate the full gamut of their dictionary look-up skills. These highly-proficient English learners certainly knew all the target words, but this knowledge could be deceptive because the senses chosen were different from the most common meaning — and these infrequent senses were often unknown or at least unfamiliar to the students. To determine whether the targeted senses of these words were infrequent, we examined the sense ordering in four learner's dictionaries.[5]

The following nine words were used in both studies: *tax* (verb), *fix* (verb), *score* (verb), *pitch* (noun), *plug* (noun), *ticket* (noun), *sharp* (adjective), *mean* (adjective), *rich* (adjective). Note that only content-word classes and not function-word classes were chosen. The number of words chosen was low, to allow the participants enough time to read the contexts provided, look up the words online, and answer pre- and post-look-up questions, all within sixty minutes.

Criteria for contexts were established in advance of the parallel studies. They had to reflect language in the US between 2000 and 2018; they should not be academic but contemporary, standard texts that most educated advanced learners would comprehend. Our understanding of standard language corresponds to Finegan (2011: 13): a language variety for activities such as radio broadcasts, university lectures, or political speech. We tried to select senses whose examples in the dictionary were not identical to the language of the contexts; the only exception was the adjective *rich* as in "Oh, now that's rich" (Context 9, Appendix A). The contexts used in both studies contain between 37 and 85 words: the

mean is 62 and the median is 60. In the time allotted, the students were able to read through each context, answer questions about it and then proceed to looking up the target sense in the dictionary; as will be seen here, the FA group demonstrated more alacrity in these tasks than the FE students.

As an example of a typical context used in the parallel studies, *ticket* at 66 words is just above the mean and the median:

Context 6, *ticket* **(noun)**

The state's Republican chairman, Edward F. Cox, offered a respectful, if cautious statement about Mr. Kolb's candidacy. 'We're glad he has formally announced his intentions,' Mr. Cox said, before saying he was excited by the possibility of other candidates, too. […]

He added that the party would be 'working collaboratively with our county chairs over the coming weeks and months to put together the state-wide **ticket**.'

In each context, the target word was in boldface and underlined, to avoid ambiguity about what to look for in the dictionary. Contexts are generous, far more than a single sentence; they afforded students the chance to understand the infrequent sense, even if they had never encountered it before. At the same time, the contexts were not overlong.

2.1.4   Procedures of the two parallel studies

These qualitative studies with anonymous volunteers intended to obtain detailed information about dictionary use, using semi-structured interviews and observation of dictionary look-up tasks (Hatherall 1984; Merriam 2009; Qu and Dumay 2011; Rubin and Rubin 1995). Our interview scripts for both studies corresponded to pre-selected topics, namely:

1:   Habits of Dictionary Use
2:   Look-up Ability of Participants
3:   Perceptions of Utility and Quality of Definitions
4:   Perceptions of Utility and Quality of Illustrative Examples

Despite having the same pre-selected topics for both studies, the interview process was still intended to discover unexpected information and not be limited to the investigation of "ready-made … categories" (Qu and Dumay 2011: 243). The scripted interview questions were supplemented when necessary; we tried to be sensitive to events as they happened during the interviews and ask appropriate follow-up questions (Hannabuss 1996). In addition, the interviewees were encouraged to speak about what they were doing (think aloud) as they looked up words (Qu and Dumay 2011; Wingate 2002); the participants were quite willing to engage in this process. We also relied on direct observation,

made possible by the face-to-face environment used (Newton 2010). Overall, this set-up provided many possibilities to gain insight into the chosen topics and beyond (Gillham 2000; Merriam 2009). The results obtained from both studies validate the qualitative format choice. It is unlikely that (for example) a written questionnaire would have yielded the type of detailed information that these two in-person studies allowed.

The interview script used in the parallel studies contained 14 questions. The first six were general questions (related to Topic 1: Habits of Dictionary Use), asked before the student was given the nine contexts to read: Three covered dictionary usage habits, two asked about the students' satisfaction with what they find in dictionaries most of the time and how quickly they find information, and one question asked what they dislike or miss in the dictionaries they use. Next in the study, we observed as the students read a context. Then the participants were asked whether they know the meaning of the word in the context and whether they can tell us what it is. Then, under our direct observation, the informants searched online in the BD for the sense that corresponded to their context (Topic 2: Look-up Ability of Participants).

The interviewees were asked whether their initial definition was correct, whether their first ideas about the meaning were comparable to what was in the dictionary (Topic 3: Perceptions of Utility and Quality of Definitions). Subsequently, students were asked about the usefulness of the illustrative examples, what they liked about them, and how they could be improved (Topic 4: Perceptions of Utility and Quality of Illustrative Examples). Another question concerned information found in square brackets "[ ]" within the examples, and whether a given example was comprehensible without this information (Topic 4). The final question asked what part of the entry was the most helpful in understanding the meaning of the word as used in the context (Topics 3 and 4). After this, the participants were asked unscripted general questions: about the dictionary of the studies, about their perceptions of the study participation experience and other (all four Topics).

2.2   Methodology for comparing the two parallel studies

After both user studies were completed and the results had been analyzed, we began the present contrastive study — without specific themes in mind. This approach differs from that used in the two original studies, where themes were pre-identified and then later supplemented with other discoveries after the parallel studies had been carried out. For this contrastive study, we began by examining the interview notes connected with the parallel FE and the FA studies. This examination allowed repeated patterns and recurring themes to emerge within the qualitative data gathered (Caulfield 2022). From a fuller list of patterns and themes, similar ones were combined to create a more concise list (Caulfield 2022), what Ryan and Bernard (2003: 85) call "winnowing themes". As Maguire and Delahunt (2017: 3353) indicate: "This means that, unlike many qualitative meth-

odologies, it is not tied to a particular epistemological or theoretical perspective".

The process of data examination proceeded as follows: We took the data previously collected from each word looked up by the participants and juxtaposed the data of the FA participants with those of the FEs. The recurring themes that emerged reflect the researcher's prior experiences with lexicographic analysis ("understanding of the phenomenon under study," Ryan and Bernard (2003: 88)) as well as their values concerning what information could prove useful in the production of future online dictionary work (Ryan and Bernard 2003). From examination of both the FA and the FE data, the following six themes or areas of discussion emerged as the most productive and significant, and will be addressed below:

— Dictionary awareness
— Frequency of dictionary use
— Satisfaction with dictionaries used
— Navigation of contexts
— Navigation of the dictionary entry
— Evaluation of dictionary components

3.   Comparison

3.1   Comparing dictionary awareness

Starting with the first questions asked in the two parallel studies, the responses of the FE and FA cohorts differed. At the outset, the deceptively simple question, "Do you use dictionaries, and if yes, which ones?" indicated that our groups were not on the same page. While all except one student in both studies stated that they use dictionaries, it was striking that the FE group only once referred to a specific, named dictionary (and this was Urban Dictionary). The FEs appeared to be unaware or minimally aware of which sources they consulted. In addition, the FE group mentioned Google more often, and not everyone in this group seemed to understand that Google Translate is not a dictionary. The response of the FA group could not have been more different. Here, each member stated that they use not one or two but several dictionaries; what is more, all FAs could name the specific dictionaries they use. Only in a single instance did an FA member state that they did not know the name of a source they used and referred to "the orange thesaurus."

3.2   Comparing frequency of dictionary use

Using dictionaries successfully is a skill like many others; engaging in the practice more often leads to better performance. It is not a surprise that the FA students, who performed better than the FEs overall in identifying the correct infrequent

senses of common words, also use dictionaries much more often. In the FA group, consulting dictionaries was, at a minimum, an activity that took place several times per week. On the other hand, the minimum usage in the FE group was a few times per month. Some of the FEs reported using dictionaries weekly as the maximum, compared to the FAs who at a maximum used dictionaries daily or several times per week. The comment of one FA: "If I don't find the exact thing [being sought] then I explore" is indicative of the full FA cohort's inclination to turn to dictionaries often and not to limit their engagement in dictionary activities.

3.3   "I can't get no satisfaction"? (Comparing satisfaction with dictionaries used)

Frequency of dictionary use is linked to satisfaction with use; a user who explores dictionaries often is one who likes dictionaries. Our questions in the two parallel studies sought to discern to what degree participants enjoyed using dictionaries and what (if anything) they missed in or disliked about dictionaries. Certainly, these themes are related to success in dictionary look-up; if users are able to find what they are looking for easily and quickly, we would guess that they are more likely to express satisfaction.

At first glance, the FE students appeared to express satisfaction with the dictionaries they used, with eight of nine saying they are satisfied and find what they are looking for quickly. (The ninth does not use dictionaries, but Google Translate.) However, a different picture emerged when the informants were probed further, to discover what they missed or disliked in dictionaries: This led to the expression on the part of the FEs of diverse dissatisfactions. While there was some very limited (and thus inconclusive) evidence that a few FEs who use dictionaries more often were more satisfied with them overall, still, depending on the individual, we heard that: Dictionaries were too complex, were poorly organized, contained too much information or too many abbreviations; definitions were unclear, too difficult, or too simple; and there were too few illustrative examples.

The FA students discussed their satisfaction in a different manner. They too claimed to be satisfied most of the time; individual comments underscored a high level of satisfaction or pointed out the usefulness in particular of print dictionaries. Concerning the quickness of information retrieval, on the surface the answers of the FAs were similar to those of the FEs. But what was striking was how the FAs appeared to define "quick." One FA mentioned that they spend no more than five to 10 minutes on searches; another mentioned that it might be necessary to scroll through a long entry if a word is complex. One FA discussed a half-hour search for a word but did not give us the impression that this half hour was problematic. Only one of the FE students mentioned a specific amount of time in response to our question about how "quickly" they retrieve information; this person stated that they take a maximum of one minute to find what they are looking for. This is not enough evidence to state with

certainty whether the FEs as a group would have considered 10 or 30 minutes to be quick or not. However, judging holistically from FE respondents' answers throughout the full interview, we consider it highly unlikely that any FE student would tolerate or engage in dictionary searches of even a full 10 minutes in length. "Quickness" is in the eye of the beholder.

The illustrative examples received a lot of attention during the questioning about satisfaction — but only from the FA students; the FEs made few specific comments apart from one passing remark about there being too few examples, and a second remark about examples not always hitting the spot. The FA students commented that they want more collocations in the dictionary, they want more examples for some words and they want numerous examples for every meaning of a word; they do not find all examples to be clear and they dislike it when examples do not fit with the specific context they are examining. Also telling in the FA discussion of examples was how these informants again named specific dictionaries; two dictionaries by name were said not to have enough illustrative examples. These comments were received before any FA looked at the target dictionary of the study. We consider that these opinions are indicative of the FAs' greater awareness that a dictionary text is not monolithic but consists of numerous components, one of which is the examples. During and following the look-up process, the FEs did home in on the illustrative examples and had much to say about them. However, as they began to think about dictionaries (the FEs perhaps for the first time; one FE student stated directly that they had never thought about our questions) in the initial, pre-look-up stage of the parallel studies, the FAs but not the FEs already demonstrated a more nuanced sense of what a dictionary is.

There is only one area in which the FEs had more specific comments to make about satisfaction, and those pertain to vocabulary rather than to a section of the dictionary. In terms of language for general purposes, the FEs stated that they were satisfied overall; however, they were not satisfied with how dictionaries treated the terminology of business and economics, or language for special purposes. They complained that they could not find many necessary terms in general dictionaries and resorted mostly to using Google or the internet to find them.

3.4   Comparing navigation of contexts

As was noted above, the informants in the parallel studies were asked to read nine relatively generous contexts, with the target word underlined and bold-faced in it. They were given as much time as they wished to read a given context and they usually signaled us (either with body language or words) that they had finished reading and were ready to begin looking up the target word.

It is safe to state that none of the participants had ever experienced a task like the one they were given in these studies. There are multiple ways of assessing how well they handled this task. First, did they understand the con-

text taken as a whole; was their proficiency level in English up to the job of comprehending the context? Second, even if they did grasp the full context eventually, how arduous was it for them to get to the point of understanding? In terms of the meaning of the target word, did they know what it meant in the context or did they just think that they knew it? If they did not know it initially, did the full context help them in figuring out the infrequent meaning of the target word?

For neither of the studies were the participants timed as they read through the contexts provided. However, impressionistically, we did not discern a difference in the read time of the two groups; both groups appeared to navigate the contexts efficiently and not struggle with them for long; we concluded that the informants all had adequate English proficiency to cope with the contexts. After each reading of a context, students were immediately asked if they knew the meaning of the target word. Here, there was a noticeable difference between the two study groups: the eight FAs considerably more frequently stated that they did *not* know the meaning of a word, as compared with the nine FEs. If we consider the noun *plug*, for which the FAs had their poorest look-up performance (five of the eight FA students found the correct sense), seven of the eight admitted to *not* knowing the meaning of the word in the context. If we consider the noun *ticket*, where the end result was an excellent FA look-up performance (all eight FAs found the right meaning), again seven of the eight FAs stated that they did *not* know the meaning when they finished reading the context.

On the other hand, the FEs said much less frequently that they did *not* know the meaning of a word. For only three of the nine target words did a majority of FEs admit that they did not know the meaning after reading the context; for five of the nine words a majority of the FAs admitted lack of knowledge of meaning. (Note that we did not include in the count of those who stated that they did *not* know anyone who said they were *unsure*.) The FEs' poorest performances were on the verb *tax* (only four of nine students selected the right sense in the dictionary) and on the adjectives *sharp* and *mean* (six of nine found the correct meaning for these two words). Despite these performances, immediately after reading the contexts, only two FEs stated that they did not know the meaning of *tax*; likewise, two of the nine FEs said they did not know the meaning of *sharp* or *mean*.

Apart from the numbers indicated above, our impression from direct observation was most certainly that the FEs often *said* that they knew an infrequent sense when they did not. One researcher noted the following while observing an FE student looking up *tax*: "[S/he] … says [s/he] … knows the meaning of *tax* but identifies the incorrect sense in the entry. [S/he] … knows the word in its basic sense …, but is not really aware of the fact that [s/he] … doesn't know it in other senses." This occurred several times during the interviews with the FEs. On the other hand, the English-philologist FAs were much more cautious in their self-assessments of their own word knowledge. They were more sensitive to the contexts and more aware when the words they already knew were not

being used in their most common sense. For eight of nine target words of the study, either all FAs or all but one selected the correct infrequent sense in the online BD. However, for four of those eight words, a majority of the FAs said they did *not* know the meaning in the context.

We interpreted these FA behaviors as an alertness to nuances of meaning that the FEs often did not possess. We consider that the FAs were actually helped by their initial lack of familiarity with infrequent senses and their awareness of their own lack of familiarity, because it heightened their attention during the reading of the contexts and during the look-up tasks. Of course, the FEs knew the common meanings of the targeted words in the study, and this little knowledge was a dangerous thing. For only five of the nine target words of the study, either all FEs or all but one selected the correct infrequent sense in the dictionary. When they approached the contexts, the FEs' observed behavior gave us the impression that they knew what they were dealing with, but this often turned out not to be the case and this misconception apparently sometimes contributed to the FE struggles with the look-up process.

While the FEs gave the appearance of navigating the contexts well, they often missed cues about the infrequent word senses — this would hinder them later, during the look-up process. The FEs didn't know what they didn't know. On the other hand, apparently the FAs did not understand the contexts any more or less than did the FEs, but the FAs *did* know what they didn't know, and this sped up their look-up process. As to whether the full context helped the students to decipher the meaning of the target word in infrequent meaning, we consider that the answer depends on the cohort. Most likely, at times the FEs were helped by the context, but at other times, it appeared that the FEs were not sensitive enough to the context they were given. As for the FA cohort, even when the context was not helpful in shedding light on a target word's meaning, it seems the context alerted them that there was something new (to them) going on and this alertness aided the look-up process.

3.5   Comparing navigation of the dictionary entry

Once the participants had read a given context and predicted the target word's meaning, they turned to word look-up in the online BD.

3.5.1   Problems with meaning

As was noted above, a greater sensitivity to the fact that the meanings involved were not the most common ones helped the FAs perform better in the navigation of the dictionary; a lower level of sensitivity hindered the efforts of the FEs. As was previously indicated, for eight of the nine target words of the study, all or all but one of the FAs selected the correct sense in the dictionary. In comparison, for only five words of the study, all or all but one of the FEs selected the correct meaning. We mentioned above that there were three items which

gave the FEs difficulty, the verb *tax* and the adjectives *sharp* and *mean*. For these senses, four out of nine FEs were correct on *tax*, six out of nine were correct on *sharp* and on *mean*. Here we will discuss these three senses and the kinds of problems that arose.

Starting with the FEs and the verb *tax*, five wrongly chose a more common verb sense instead of the correct infrequent sense. Initially (before look-up), these same students defined the word according to its common meaning after reading the provided context. Because they believed that they knew the meaning from the outset, during look-up they were not able to change their minds — despite having read a context containing a different meaning. This was not the case with every FE; three of the four who ended up making the right choice on *tax* initially considered the same incorrect senses as their peers. However, they slowly moved away from these incorrect choices of a common meaning to accept the infrequent, correct sense. One of those who went down this path commented that the meaning was "not the same as what I thought."

For the adjectives *sharp* and *mean*, we observed a very similar process as with *tax*. On *sharp*, four of the nine FE students spent time vacillating between the correct, infrequent sense and a more common incorrect sense; three ultimately chose the correct sense and one stuck with the incorrect. One of the FE students who vacillated but chose correctly commented that the correct and incorrect senses were "not similar," but could both do in the provided context (!). Another FE who chose the incorrect sense, noted that one of the illustrative examples for the correct sense of *sharp* had "outfit" in it, similar to "suit" from the provided context. Despite this similarity, after much deliberation, this student still moved back to a more common but incorrect sense. For *mean*, there was the same type of behavior from two FEs: They went back and forth between the correct meaning and an incorrect one before ultimately choosing the correct, less frequent sense.

What we see from the FEs is, first, a great expenditure of time. They took a long time to give up on their preconceived notions of the meanings of the target words and move over to accept senses that were infrequent and tied to their provided contexts. If they had not been participating in a study where they knew that they were supposed to choose just one sense from the dictionary, it is doubtful that these students would have persisted. Most likely, the difficulty of the task would have caused them to give up; this is what one FE student themself told us in response to an earlier question of our study (see 3.3 above).

On *tax*, *mean*, and *sharp*, the FAs did better; for all three words seven of eight students chose the correct sense. For *tax*, the students made their choice quickly and most did not even consider a more common sense. For *sharp* and *mean*, there was vacillation between a more common sense and the correct infrequent sense that was similar in nature to the vacillation demonstrated by the FEs. For *sharp*, four FA students considered a more common sense and three of these ultimately chose the correct sense. Here, the difference in performance as compared with the FEs relates to the amount of time that this deliberation process went on; it appeared to us that the FAs were quicker in moving to the sense that became their final answer. That being said, the FAs

took longer to arrive at their answers for *sharp* than they usually took with the other entries. For *mean*, the same state of affairs held: Similar to the FEs, two FAs considered an incorrect sense but quickly moved over and decided upon the correct sense. Overall, for all three of these words, the FAs performed better than did the FEs.

3.5.2   Problems with parts of speech

We have seen above that overall, the philologist-FAs did better in look-up and that the FEs had more problems navigating meaning during the look-up process, which resulted in less frequent selection of the correct sense. As has been noted, we attribute this mainly to sensitivity (or lack thereof) to the new or unknown (to the participants) aspects of meaning displayed in the contexts. In addition, other factors not directly associated with word meaning also affected the performance of both FEs and FAs. As compared with the FAs, the FEs had many more problems recognizing the part of speech of the words in their contexts and in the entries in the BD (see Farina et al. 2019).

Nevertheless, the philologist–FAs, while having vastly fewer difficulties in identifying part of speech, were not spared this problem entirely. The single word that gave the FAs the most difficulty was the noun *plug*; only five of the eight FA participants identified the correct sense. However, two of the three FA students who got this item wrong did not have a semantic problem but a problem recognizing that *plug* from their context was a noun. These two chose a verb sense over the correct noun sense. The verb sense that they chose was semantically correct, linked to the correct noun sense for *plug*. The FEs did better on *plug* than the FAs, with all but one of them getting it correct. Two FEs were distracted by a verb sense; however, one realized the mistake and moved over to the correct noun sense. This good performance by the FEs on the noun *plug* does not mitigate the serious problem they had throughout the study in identifying part of speech. On the other hand, part of speech mostly was not a problem for the linguistically more savvy FAs (see Vrbinc et al. in press).

Another, more minor problem than part of speech for the FEs was a problem in all three verb entries with the canonical form. In general, if an FE saw, for example, the form *fixing* in the provided context, they wanted to see that same form in the dictionary and sometimes encountered difficulties if they did not. The more linguistically aware FAs had no problems in adapting to the different canonical forms that they met in the verb contexts.

3.6   Comparing evaluation of dictionary components

In this section, we discuss the diverse ways in which the FAs and FEs speak about the components of the dictionary, and how both cohorts evaluate the usefulness of various parts of the dictionary in helping them to understand meaning.

3.6.1   Evaluating definition

A strong majority of the participants in both cohorts considered that the definition is the most useful element of the dictionary entry. There was close agreement among the FEs and the FAs on the general usefulness of the definition over the other parts of the dictionary entry. The FAs very often pinpointed which specific words or parts within the definitions were the most useful; the FEs sometimes identified specific parts but less often. There are two entries for which the two cohorts had differing views on the definition, but their comments do not allow for solid conclusions as to why they held the views that they did. For the noun *fix*, the FAs unanimously found the definition to be the most useful part, whereas only four of the nine FEs shared that view. Conversely, on the noun *ticket*, all nine FEs considered the definition to be the most useful, but only two of eight FAs did.

There were two entries where both FEs and FAs did *not* find the definition to be the most useful. For the adjective *mean*, only three people in both cohorts liked the definition. Elsewhere it has been proposed that perhaps the complex nature of the target sense of *mean* (Farina et al. 2019; Vrbinc et al. in press) drove the dislike of the definition. The adjective *rich* also had an unpopular definition:

> … used to say that a person's comment or criticism is surprising or amusing because the same comment or criticism could be made about that person.

Only three FEs found it to be the most useful part of the entry and no FAs did: Three FAs found it to be too long and one said that it was not helpful; one FE said that it could be shortened. We speculate that perhaps it might not be the actual length of the definition that was problematic for these users, but rather its pragmatic format. Or, it could simply be that both the FEs and FAs liked the examples for *rich* more and found them to be the most useful part of the entry, edging out the definition. (Note that *rich* was the only one of the nine target words for which a dictionary example matched the context.)

3.6.2   Evaluating examples

Members of both cohorts stated much less frequently that they liked the examples best over the definition. Variants of the statement, "If the definition is good, you don't need examples" were repeated often by the FAs. The philologist–FAs commented on the adequacy of the definition when discussing the examples. On the other hand, the FEs rarely made evaluative comments about the definition quality, but would say, for example, that they only read the examples if they "need" them. In only one instance did an FE say that since the definition was clear, examples were not needed. The FA belief that a good definition does not necessarily need examples was borne out by FA behaviors: We observed that the FAs did not dwell on the examples when they considered that they had already identified the correct meaning based on the definition.

The sole exception to the preference of the two cohorts for definition over examples was the entry for *rich*.

Above (section 3.3) we discussed how the FA students often called for more dictionary examples, longer examples, etc. when they were talking about their overall level of satisfaction with dictionaries. At that early point during the interviews (before the look-up process began), the FEs said almost nothing about examples. However, when the FEs were actually looking at specific examples, they were more forthcoming. They began to make statements similar to the FAs, concerning the need for more examples, longer examples, etc. It is interesting that until they looked at concrete examples, the FEs clearly had not thought much or at all about this dictionary component, in contradistinction to the philologist FAs, whose greater dictionary experience had allowed them to form opinions about examples prior to participating in this study.

It is interesting that it was rare for any FE to say that a combination of different dictionary elements was useful for a given context. Sometimes FAs said that a combination of definition *and* examples was useful, but this happened less frequently than their identifying either definition alone or examples alone as most useful.

3.6.3   Evaluating square-bracketed information in illustrative examples

As one might expect, there was a great diversity of opinion about the information provided in the square brackets of some (but not all) examples. There appeared to be a difference in kind between the comments of the FEs and the FAs. The FAs gave specific, detailed, and diverse evaluations of individual pieces of square-bracketed information within the examples. At times, different FAs liked or disliked the same piece of information, but what is telling is that they had specific judgments about how the information fit within the broader scheme of examples and entries, how the information contributed (or not) to the betterment of an example or dictionary entry. We labeled these types of comments as "stylistic assessments": The FAs were deciding how the square-bracketed information fit into the whole of a dictionary entry or at least into the ensemble of a sense's examples.

The FEs, after their attention had been drawn to it, certainly would comment on the square-bracketed information. They would state that such information was "useful" or "helpful." At times they stated that without it, they would (or would not) understand an example. One FE said that this was the first time they had ever noticed brackets in a dictionary, another said that the equal sign [=] sometimes present within brackets was confusing, yet another characterized such elements as square brackets in a dictionary as "noise." The FE comments about square-bracketed information reflect that, as they approached the dictionary of the study, they had no schema in mind for dictionaries; they did not know what to expect. So, each encounter with a square bracket took place as if no square bracket — or no dictionary — had ever been seen before.

The FAs looked at the dictionary entry as a whole consisting of various familiar components. When they evaluated the square-bracketed information within the examples, certainly they thought about how such information contributed to a specific example, but they were also assessing the functionality of the bracketed information within the sense, within the full entry, and within the dictionary as a whole.

4.   Looking up *sharp*: Conclusions

These two in-person qualitative studies, where the users were directly observed and asked what they thought as they used an online dictionary, allow us to obtain information that would be impossible to obtain otherwise. At looking up *sharp* and at looking up the other target senses of these two studies, certainly the 3rd-year undergraduate English majors from the Faculty of Arts (FA) at the University of Ljubljana excelled. Their 3rd-year undergraduate School of Economics and Business (FE) peers performed well but their approach to the look-up tasks was radically different and consequently their end results were not the same.

While almost any lexicographer would predict that English philology students would have more "dictionary-awareness" and perform better than general educated dictionary users, it is important to understand exactly how and why the former group performed better. It is important as a factor that, we hope, could influence the construction of future online dictionaries.

First, coming to the study with a schema of what a dictionary is, what parts it consists of and how to make one's way through it, was essential to the FAs' consistent success during the look-up processes of their study. The FAs knew the terrain very well and they had traveled it frequently. On the other hand, as the study involving them shows, the FEs were using their GPS and often had to "recalculate." For the FEs, their sincere efforts at navigating the dictionary were often unsatisfying and frustrating; parts of the dictionary to them were just "noise." The lesson here is that the general dictionary user is always using a GPS and the lexicographer should never construct any lexicographic product as if the user knows the terrain.

Taking *sharp* as an example, we proposed (Farina et al. 2019) that the positioning of the correct information (sense #12 of 13 senses) was the main obstacle to the FE users' efforts to find the correct information:

12
informal: stylish or fashionable
- He's a *sharp* dresser.
- a *sharp* outfit
- You're looking very *sharp* today.

If this proposal is correct, it means that the FE users had to travel farther down the entry than expected and many were not persistent enough to do so. In

addition, the third sense, "noticeable," close to the beginning of the entry, deceived some FEs and they did not continue down the list of senses once they had landed on sense #3. Other available online learner's dictionaries also present this sense far down in the entry; the *Oxford Advanced Learner's Dictionary* has this as sense #12 out of 15; *Longman Dictionary of Contemporary English* has it as #12 of 16, and *Macmillan English Dictionary* as #8 of 11. Irrespective of the quality of information to be found, many dictionary users simply will not travel this far. Nevertheless, the content of the sense remains very important, because if a user does manage to get all the way to this sense, it is necessary for the information there to be useful. The *Oxford* sense has the following:

> 12. [usually before noun] (of clothes or the way somebody dresses) fashionable and new
> o *The consultants were a group of men in* **sharp suits**.
> o *Todd is a* **sharp dresser**.

We consider that this would have been more helpful for our FEs, because the examples are full sentences; many FEs (as well as some FAs) commented that they do not like short dictionary examples (Farina et al. 2019; Vrbinc et al. in press). The longer *Oxford* examples do not take up much more screen space.

Another factor that might make access to the *sharp* information easier is that *outfit*, which appeared in the BD example is a hypernym whereas *Oxford* used *suit*, a hyponym. Generally, the FAs liked the example with *outfit* and appeared familiar with the word; on the other hand, it is not clear to us that most/all FEs were fully familiar with the hypernym.

Apart from the issues of word choice within illustrative examples and navigation of long entries, dictionaries are not personal to the FEs. Compared to the FAs, the FEs do not have a preferred dictionary, dictionaries are nameless, and a dictionary is not a "thing." This matters immensely; the dictionary has already been integrated into the life experience of the FAs and this helps drive what happens when they consult one online. If there is any hope at all that lexicographic tools will become integrated into the lives of well-educated people like the FEs, then this should change.

What does this mean for the lexicographer and for future lexicographic work? It means that the lexicographer should be extremely concerned about the success of users who are like the FEs. The lexicographer cannot make *any* assumptions about the familiarity of the educated general user with the lexicographic medium. Online lexicographic media of today are still too deeply rooted in the print dictionaries of the past. They are still more oriented toward persons with experience like the FAs, who can meet practically any linguistic or lexicographic challenge thrown at them. The target users (certainly not the FAs) of any modern online dictionary do not know the terrain, do not have any interest in learning it, and will not learn it. They must be provided with an online format that requires as few navigation skills as possible, an "uber-GPS"; any small flaw in the presentation of the information will without doubt cause

some users to go astray. And if they are led astray, not only will they receive minimal-to-no benefit from the dictionary at hand, but they will hesitate before using any online dictionary again.

Acknowledgements

Endnotes

1. This abbreviation, derived from the previous name of the School of Economics and Business (i.e., the Faculty of Economics), is being retained here for the convenience of readers of Farina et al. (2019), which describes these students and uses the same "FE" abbreviation.
2. This dictionary is identical to what it was under the previous title. This information was confirmed by Peter Sokolowski, Editor at Large of Merriam-Webster. Persons accessing the former website of this dictionary (http://learnersdictionary.com/) are redirected to the new website, https://www.britannica.com/dictionary.
3. Please refer to Farina et al. (2019) for a lengthier discussion of previous studies.
4. For more information about the educational development of both groups' language proficiency, consult Farina et al. (2019) and Vrbinc et al. (in press).
5. The full explanation of the investigation of sense frequency in preparation for the two studies can be found in Farina et al. (2019).

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Appendix A: List of Contexts and their References

Context 1

This small desert nation of six million opened its doors to the newcomers but was quickly overwhelmed as they gobbled up jobs, **taxed** scarce water resources and forced schools into double shifts. About two-thirds of the refugees are squatting in Jordanian cities and villages, but the pathos and problems are most profound in Zaatari […].

Context 2

ROVANIEMI, Finland — A man arrived at the police station here in 2011 with an unusual tip. He told the police that a Singaporean man was **fixing** matches with the local professional soccer team. The police were incredulous.

Context 3

Back when Patrick had a job at an auto-parts store and as a banquet server, his morning routine involved driving to Lawrence before work and **scoring** his daily fix.

    Then he would shoot up with heroin or fentanyl at the wheel of the car while driving back to New Hampshire.

Context 4

With no discussion of a business model and only vague statements that offer no numbers, investors will be unlikely to take a **pitch** like this seriously. You need to put numbers to the idea and make the business case. Moreover, if you are going to ask for money, investors need to know how much, what it will be used for and what kind of return will be generated.

Context 5

Microsoft says that the wireless sharing is a new way to discover music. But you can't shake the feeling that it's all just a big **plug** for Microsoft's music store. If it's truly about the joy of music discovery, why doesn't Microsoft let you buy your discoveries from any of the PlaysForSure stores?

Context 6

The state's Republican chairman, Edward F. Cox, offered a respectful, if cautious statement about Mr. Kolb's candidacy. 'We're glad he has formally announced his intentions,' Mr. Cox said, before saying he was excited by the possibility of other candidates, too. […]

    He added that the party would be 'working collaboratively with our county chairs over the coming weeks and months to put together the statewide **ticket**.'

Context 7

Her rock 'n' roll friends might have expected a hip 'n' cool outfit for her English country wedding. But it was her husband, Jamie Hince, the guitarist from The Kills, in his **sharp** blue Yves Saint Laurent suit, who brought a touch of music-world fantasy.

Context 8

My biggest help in mothering with MS? I give myself permission to not be perfect. I let myself adjust things according to what kind of day I'm having. When I can't go for walks with Jerry, I lie on the bed and watch him play Nintendo or read with him or play a **mean** game of Checkers […]. I am still involved very much in my kids' lives.

Context 9

'Jesus,' Arden says, stacking his hands on the top of his head. 'I can't win.'

Oh, now that's **rich**. 'You can't win? *You?* Arden Moss? You've already won, idiot. You have everything you've ever wanted in life, all handed to you on a silver platter.'

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