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Reading L2 Russian: The Challenges of the Russian-English Dictionary

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ABSTRACT

This descriptive study examines when and how students use Russian-English dictionaries while reading informational texts in Russian and what success they have with word lookup. The study uses introspective verbal protocols (i.e., think-alouds) to follow how readers construct meaning from two texts while reading them for a limited time first without a dictionary and then with access to a paper bilingual dictionary. Quantitative and qualitative data about readers' language and dictionary skills are presented based on the readers' think-aloud protocols for the dictionary portion of the reading sessions. The data reveal patterns of dictionary usage and problems in finding words in the dictionary (alphabetic order, parsing, selecting correct headword, etc.). Implications for reading pedagogy are considered.

INTRODUCTION

The question of how and when second language (L2) learners use dictionaries when reading for meaning in the target language has attracted the attention of a small number of researchers (Fraser, 1999a, 1999b; Harley & Hart, 2000; Pritchard, 2008; Prichard & Matsumoto, 2011; Tono, 2001), who work primarily with students reading L2 English. While these studies make valuable contributions to the field, it is reasonable to think that for learners with English as their first language (L1), other languages such as French, Russian, or Chinese would present different challenges in using a dictionary when reading an L2 informational text. L1 English learners may exhibit different patterns of success and difficulties across writing systems and with languages that differ from English in morphological and syntactic complexity. This article attempts to broaden the research base on dictionary usage by describing a cohort of L1 English students of L2 Russian while they were reading two informational texts.

Keefe (2004) found that changes in reading pedagogy over the past 30 years are now well reflected in Russian language textbooks, and that the most common textbooks for students learning Russian in the US now feature instruction in top-down and bottom-up reading strategies in addition to traditional comprehension questions. While all of these techniques help readers interact with authentic texts and derive information from them, one traditional practice (i.e., guiding learners in looking up unknown words in a dictionary) is not well represented in Russian pedagogical materials.¹ This lack of focus means that language teachers know very little about

when and how students use the Russian-English section of the dictionary to look up unfamiliar words when completing reading tasks. This article explores which words L2 Russian readers look up, what success they have in finding those words in a paper Russian-English dictionary, and how they incorporate dictionary information into their construction of a text's meaning. The data to answer these questions come from a larger study that tracked how fifth-semester students of Russian read informational texts. The study used introspective verbal protocols (i.e., think-alouds) to follow how readers constructed meaning from two texts while reading them for a limited time first without a dictionary and then with access to a paper bilingual dictionary. The readers' think-aloud protocols for the dictionary portion of the reading sessions reveal some interesting quantitative and qualitative data about readers' language and dictionary skills. The patterns in these data are analyzed and their implications for reading pedagogy, particularly for the field of Russian as a foreign language, are considered.

BACKGROUND

The lion's share of the recent research on dictionaries in L2 reading has looked at vocabulary learning and reading comprehension in connection with the use of online dictionaries (Knight, 1994; Laufer & Hill, 2000), of online dictionaries versus paper dictionaries (Dziemianko, 2010; Flynn, 2007; Hulstijn, Holland, & Greidanus, 1996), and of online marginal glosses of various kinds (Abraham, 2008; Chun & Plass, 1996; Comer & Keefe, 2000; Gettys, Imhof, & Kautz, 2001; Peters, Hulstijn, Sercu, & Lutjeharms, 2009). Almost all of these studies find advantages for readers who have access to vocabulary support in one form or another.ⁱⁱ This is not surprising given that research has shown how difficult it is for an L2 reader to infer a word's meaning from context (Frantzen, 2003; Wesche & Paribakht, 2010). A smaller set of dictionary studies (Fraser, 1999a, 1999b; Harley & Hart, 2000; Pritchard, 2008; Tono, 2001) has probed when readers use the dictionary, what they look for in it, and how successful they are at using information from the dictionary entry in comprehending the text. Since these questions are more relevant to this study, they will be the focus of the literature review.

Harley and Hart (2000) looked at Canadian high-school learners' self-reported use of dictionaries for figuring out unknown L2 words. Their participants reported an overwhelming preference for bilingual dictionaries over monolingual L2 dictionaries, and when consulting dictionaries, these learners primarily looked for a word's meaning or checked its spelling.

Fraser (1999a) used think-aloud methodology to study the lexical processing strategies (ignore, infer, consult dictionary) of eight intermediate ESL students over a five-month period. Specifically, she had participants first read informational texts and then asked them to point out unfamiliar words and tell her which strategy they used to figure out their meanings. Of the three strategies, readers consulted a dictionary only 29% of the time, although they often consulted the dictionary after trying to infer a word's meaning. The sequence "infer then consult" had a very positive effect of a reader's ability to recall the word later during vocabulary tests. In the qualitative analysis of her data, Fraser (1999b) used the term "monitoring" to describe how her participants checked the meanings of words inferred and/or looked up against the word's use in the immediate sentence context. She found that, when readers first tried to infer word meaning and then consulted a dictionary, they were more likely to monitor or check the appropriateness of the word's meaning for the immediate context than when they used only a single strategy. Fraser noted that her subjects' regular consultations with the dictionary might have had something to do

with the experimental conditions: the texts were hard and long (over 1,000 words each); readers were required to answer both comprehension questions and make an oral summary of the text after reading. In neither study did Fraser report that her readers were unsuccessful in finding any English words they attempted to look up. Nor did she note how often they picked contextually incorrect word meanings whether they were monitoring those meanings or not.

Tono (2001) videotaped Japanese EFL students at different proficiency levels as they completed three different tasks with a bilingual dictionary. Two tasks looked specifically at dictionary skills, while the third tracked the subjects' dictionary use during an L2-L1 translation assignment. In all tasks, both higher proficiency and lower proficiency learners showed significant differences in their dictionary behaviors. The better their global understanding of the passage, the more efficient the readers were in using the dictionary to solve the task at hand. The translation task showed the greatest effect for language proficiency on dictionary use with the more proficient readers consulting less. However, the task also revealed individual differences in dictionary look-up styles—one of the highly proficient learners used the dictionary significantly more than the other proficient learners because she understood translation to be a task that required very specific and accurate renderings of the original text's phrasings. Tono's study underscores that efficient dictionary use is connected with overall language proficiency, but it reminds us that individuals differ in their dictionary consultation styles and that the nature of the experimental tasks is also a factor in dictionary use.

Prichard (2008) studied the pattern of online dictionary use among L1 Japanese readers of L2 English and found that, while two-thirds of his advanced-level ESL subjects were often selective in their dictionary use when reading, a full one-third relied on the dictionary excessively, often looking up words that were not critical for general comprehension of the informational text. Since dictionary look-up adds to reading time, he concluded that readers would benefit from training in how to be more selective in dictionary usage.

These descriptive studies of readers' dictionary use informed the formulation of certain parameters in the current study. From Harley and Hart's survey results (2000) and personal classroom experience, the researcher determined that readers at the fifth-semester level would prefer access to a bilingual dictionary rather than a monolingual L2 one. Pritchard's (2008) findings (and again the researcher's classroom experience) indicated that the study design would need to safeguard against excessive reliance on the dictionary. To accomplish this, readers' time with each text was split into two phases: an initial 20 minutes with the text alone, followed by 10 minutes with the text and a paper bilingual dictionary. The time split required readers to use a range of strategies for making sense of the text according to their individual styles in reading and look-up behaviors.

Although the advantages of electronic dictionaries are well established, this study allowed readers to use of a paper bilingual dictionary (Concise Oxford, 1998) for logistical and methodological reasons. First, it would be hard to arrange computer access that would restrict readers to using only one specified electronic dictionary and keep them from going to other internet-based dictionaries and resources. Second, many free web-based reference resources have banner and sideline ads that could distract readers. Third, computerized dictionaries could add a confounding variable of reader typing skills and differences in Cyrillic keyboard layouts that effect readers' search behaviors. Fourth, since many online dictionaries automatically parse inflected forms, online dictionaries would obscure to what extent readers at the upper-intermediate level can recover the dictionary headword for the inflected forms of words that they encounter in a text. Personal experience indicates that this is a problem, and the use of a paper

dictionary in this study would make it clear to what extent it is a problem, and for what kinds of words.

Furthermore, the dictionary study was part of a larger project to look at reader strategies and employed think-aloud methodology, where readers verbalize everything that comes into their minds as they read a text (Pressley & Afflerbach, 1995). Think-aloud methodology requires the researcher to monitor that participants are actively speaking their thoughts aloud and to prompt them when they fall silent for more than 30 seconds. There was concern that the combination of reading and typing on the computer keyboard might occupy too much of the readers' attention and, therefore, reduce the quality of their introspection. Accordingly, the three research questions posed in this study are as follows:

1. How do readers use a bilingual dictionary, and how successful are they in looking up words?
2. What words are readers unable to find in the dictionary and are there patterns to these difficulties?
3. How often do readers monitor the definitions they find and how efficient are readers at this process?

METHODS

Participants

Twelve English L1 students-volunteers at a large Midwestern university in the US, who were all enrolled in a fifth-semester Russian class in Fall 2009 or Fall 2010, participated in this study. Six participants had been to Russia for an average stay of six weeks (range: 2-8 weeks); five reported using Russian at least once a week outside of class with Russian-speaking friends. All participants conducted their think-alouds in English, and the names used in this article are pseudonyms.

Texts

Four texts were used in this study on two topics: the Moscow subway system and the history of tea and samovars in Russia. Each topic was represented by one text drawn from a school-age children's book (Shironina, 2009) while the second text was drawn from adult encyclopedia entries (Dzhakeli, Tsanova, & Urushadze, 1978; Golubev & Iakobson, 1974; "Samovar", 2009). The children's texts were used in full, while the selections from the adult encyclopedias were shorted and adjusted so that they would cover the same thematic material as the children's texts. The children's texts were reproduced exactly for this study including illustrations, captions, and sidebar text; the adult encyclopedia entries were formatted similarly to the children's texts and were outfitted with the same illustrations and captions from the children's texts. All four texts (Children's Tea, Children's Metro, Encyclopedia Tea, Encyclopedia Metro, hereafter CT, CM, ET, and EM respectively) were reviewed by a native speaker of Russian who found no stylistic or other problems with them. Each participant read two texts (one from the children's source, one from the encyclopedia source) on different topics. The order of the texts varied, and participants were assigned to texts randomly.

The texts (average length: 362 words; range: 313-432) were likely to be difficult for students at this level and required readers to use a number of different reading strategies and use the dictionary quite selectively, since they would not be able to look up all the words that were unfamiliar to them in the allotted time.

Procedures

Participants met individually with the researcher and worked in a soundproof booth while the researcher recorded and monitored their progress remotely. At their first session, participants signed the written consent form and completed a background survey. The researcher explained that the goal of the study was to investigate how much students could learn about a topic by reading an informational text in Russian. Participants received training in the think-aloud procedure by listening to a recorded sample and then by completing a three-minute sample think-aloud with a short Russian text, drawn from a language textbook. Participants were allowed to ask questions about the procedure at any time during the training.

To activate their background knowledge before reading, participants completed a three-minute brainstorming activity on the topic of the reading (i.e., “The Moscow Metro” or “Tea and tea-drinking in Russia”) where they said aloud what they knew about the topic. After the brainstorming activity, participants read the texts. After twenty minutes of reading, they were allowed access to a paper bilingual dictionary for 10 minutes if they wanted to look up any words to help their understanding of the text. During all thirty minutes with the text, the participants spoke their thoughts aloud. If the participants went silent during the reading for more than 30 seconds, the researcher prompted them with the questions: “What are you looking at now? What are you thinking now?” After the reading period, the participants put the text away and wrote down in English everything that they had learned about the topic from the text that they had read. Upon completing the second reading session, participants received payment for their time.

Data

The think-alouds were audio recorded and transcribed by the researcher. The pre-dictionary portion of the think-aloud was reviewed for any words from the text that readers indicated that they would like to look up during the dictionary portion of the reading period. From the dictionary portion of the think-alouds, the researcher recorded the words that the readers attempted to look up, the words that they found, and the words that they could not find. These were counted along with the number of times participants “monitored” or attempted to integrate definitions and L1 equivalents into their construction of the meaning of the sentence. The transcripts were reviewed for qualitative data that would help put the quantitative data in perspective.

RESULTS

Research Question 1. Description of Dictionary Use

Table 1 presents the frequency data about the readers’ dictionary use. During the pre-dictionary phase, readers noted on average only about two words per text that they wanted to look up,

although they varied widely on this behavior (range 0-12). Seven readers mentioned underlining words that they would prioritize for look up once they had access to the dictionary.

Table 1. Dictionary Use by Student and Text

Reader	Text	# Wanted	Strategy	# Looked up	# Found	Found (%)	# Monitored
Ann	CT	1	Back	10	8	80	1
	EM	0	Back	8	6	75	0
Beth	CT	0	Forward	9	6	67	5
	EM	1	Mixed	6	5	83	4
Daniel	CM	0	Forward	10	9	90	7
	ET	0	Forward	10	9	90	7
George	CM	0	Back	10	5	50	4
	ET	1	Back	11	8	73	5
Harriet	CT	2	Forward	6	1	17	4
	EM	8	Back	6	5	83	4
Henry	CM	2	Forward	8	7	88	5
	ET	8	Back	9	8	89	8
Jane	CT	1	Forward	2	2	100	0
	EM	1	Mixed	1	1	100	0
Mark	CM	0	Back	7	5	71	1
	ET	1	Back	9	7	78	0
Mary	CM	12	Back	8	6	75	6
	ET	2	Back	8	7	88	3
Melissa	CT	1	Back	11	6	55	6
	EM	2	Back	10	10	100	8
Nora	CM	1	Forward	7	6	86	5
	ET	0	Back	7	4	57	2
Simon	CT	1	Back	5	3	60	2
	EM	1	Back	4	3	75	3
Mean		1.9		7.6	5.7	76	3.8
SD		3.02		2.65	2.46	19	2.57

Notes. # *Wanted* refers to the number of times readers noted a word for look up during their pre-dictionary reading time. *Strategy* refers to whether the reader continued from their current place when they had access to the dictionary. # *Looked up* refers to the number of words that readers attempted to look up during the dictionary phase. # *Found* refers to the incidents of successful lookups; # *Monitored* refers to the number of times that dictionary information was explicitly integrated into making sense of the text.

When they received access to the dictionary, in 15 of the reading sessions, readers went back to an earlier place in the text and tried to piece together a fuller understanding of what they had already read (Column 4 “Back”). In 7 cases, they started to use the dictionary from the place in the text where they were reading at the moment when they received access (Column 4 “Forward”); in 2 cases, there was a brief return to check one or two words and then readers continued to the end (Column 4 “Mixed”). Four of the twelve readers read one way with one text and took a different approach on the other text.

Except for Jane, all readers used the full ten minutes that they had with the dictionary to look up words. They looked up between 7 and 8 words on average per reading, and of the words

looked up, readers found the correct entry three-fourths of the time (76%) on average. Even the fastest dictionary users did not manage to look up more than 11 words in the 10-minute period.

Research Question 1. Qualitative Data

The researcher generated a list of words that readers intended to look up, the list of words they did look up, and a list of words that readers did not find or had difficulty finding in the dictionary (see appendix A). Sometimes, one and the same word form would be found by some readers and not by others; such words are listed in both the found and not-found lists.

When working with a text with a lot of unknown words, readers were idiosyncratic in their choice of words to look up, although they frequently verbalized thoughts like “I’ve seen that word a lot” and “There’s that word again.” Several readers strategized that they should look up verbs conjecturing that they would be most helpful in deciphering the text. Readers often decided not to look up words they recognized as adjectives noting that they were not that important for understanding the text as a whole. Most readers were very strategic in their dictionary use, looking up words that were in the same part of the dictionary “because I am in the з section.” Sometimes, as they reviewed parts of the text, they revised their plans about what words to look up. During the pre-dictionary phase Henry had singled out the word *залы* [zaly = halls] in the CM text, but later he commented: “I underlined *залы* [zaly = halls] but I’m thinking that it’s like *зал* [zal] which is hall and I’m not going to bother to look that one up.”

Research Question 2. Words Not Found

Leaving aside the eight words that readers did not find because they ran out of time, readers failed to find 45 words, approximately one-quarter of all words they attempted to look up. All readers had some difficulties finding words, and sometimes they experienced more difficulty with words in one text than in the other. Since retrieval difficulties are so broadly distributed, failure to find words cannot be simply attributed to better or worse readers, but seems to be a function of the specific words looked up.

Research Question 2. Qualitative Data

When the troublesome words were examined in light of the think-aloud comments, they seemed to cluster around six different issues for readers (see Table 2). The issue of finding the right word meaning for the context is the most frequent, often because the textual words were polysemous and readers did not understand enough of the global context to pick the right meaning. Another problem was that instead of the main dictionary entry for the word, readers found a secondary headword, which usually held a specialized meaning of the word. For example, in the *Concise Oxford* (1998), the derived imperfective verb *заливать* [zalivat’ = to pour over, to flood] is listed both under the headword *залить* [zalit’] (where it gets full treatment) and under the headword *заливать* [zalivat’] (where it is connected only with the specialized meaning ‘to lie’). When working on the sentence “Везде заливают в чайнике кипятком сушеные чайные листья [=everywhere they pour boiling water over the dried tea leaves in the tea pot],” several readers found the latter entry when they needed the former. Beth provides an interesting example of what can happen in such cases. She was certain that the meaning “to lie” was wrong for the context, but she did not continue to look through the

dictionary once she found it. Instead, the mistaken definition prompted her to rethink the context, and she wondered if the sentence meant “like telling the future in tea leaves?” To confirm this guess, she looked up three more words in the immediate context (*листья* [list'ia = leaves], *везде* [vezde=everywhere], *сушеные* [sushenye = dried]), none of which contradicted her misreading of *заливать* [zalivat'], and so she concluded that the clause still meant “something about telling lies in boiling dried tea leaves.”

Some readers could not find words in the dictionary because they were unable to recover the headword from the form encountered in the text (for example, the textual form *ведётся* [vedetsia] is hard to associate with the headword *вестись* [vestis']). Uncertainty about recovering the headword also discouraged some readers from looking up certain words altogether. For example, Henry considers looking up the word *считающие* [schitaiushchie = considering; headword: *считать* schitat'] but he skips it because “I’m not sure that that will actually be in the dictionary.” *Напоминать* [napominat' = to remind] presented two different problems for readers: some misread read the word as a prefixed version of *понимать* [ponimat' = to understand]; others noted the prefix and seemed to interpret the verb as the perfective in the non-existent aspect pair (**поминать/напоминать* [pominat' / napominat']) rather than as a derived imperfective in the aspect pair (*напоминать/напомнить* [napominat'/napomnit']). Although Mark notes that the CM text contains both the word *ветку* [vetku= branch_{accusative-singular}] and *веток* [vetok= branch_{genitive-plural}], and although in his brainstorming he mentioned that Moscow metro is structured on a circle line with other lines branching off of it, he looks for the word under the headword *веток* [vetok], rather than *ветка* [vetka], and when he fails to find an entry, he abandons his search.

Related to this parsing problem are instances where readers found an inexact match for the word they were looking up. The length of unfamiliar words sometimes caused readers problems in finding the exact headword for the textual word. Since words with the same prefix and root are located next to each other in the dictionary, approximate matches can sometimes yield useful meanings for students. For example, Nora did not find the headword for the textual form *увеличивается* [uvelichivaetsia = increases], but she commented: “I’m seeing a lot of words with that start with, like, *увелич-* [uvelich-] and they all mean, like, ‘to increase’ or ‘magnify’ so I’m guessing the trade between... of tea between Russia and China was increasing by 1679.” Conversely, relying on inexact matches can lead to serious miscomprehension for words that are merely close to each other in the dictionary (e.g., *несущий* [nesushchii = bearing] / *несущественный* [nesushchestvennyi = insignificant]), or where a single root yields very different meanings depending on part of speech (e.g., adjective: *существенный* [sushchestvennyi = significant]/ verb: *существовать* [sushchestvovat' = to exist]). Readers need to be aware of the limitations of approximate matches.

Compound words, perhaps because they are not very common in Russian, caused readers problems. *Внеуличная* [vneulichnaia (from the preposition *vne* = out of, extra- + *ulichnyi* = street)] was harder for readers than *древнеегипетский* [drevneegipetskii (from *drevne* = ancient] + *egipetskii* = Egyptian)] since with the latter they at least got to the dictionary entry *древний* [drevnii= ancient] and interpolated the notion of “classical Greek.” In contrast, no one separated *вне-* [vne-] from *уличный* [ulichnyi], not even the one reader who commented in the pre-dictionary phase that this word reminded her of the noun *улица* [ulitsa =street]. The bilingual dictionary was also no help to readers unfamiliar with some specific terms and concepts mentioned in the texts, since, for example, *самовар* [samovar] was glossed as ‘samovar.’

Table 2. Words Not Found During Look Up

Reader's Difficulty	Instances	Typical Words (and Comments)
Finds an entry, but not the right meaning for context	15	заключён [zakliuchen = concluded] заливают [zalivaiut = they pour over] настоялся [nastoialsia = it steeped] относится [otnositsia = it relates] листья [list'ia = leaves]
Parses word incorrectly and cannot find dictionary headword	6	ведётся [vedetsia = is conducted; headword needed: вести́сь = vestis'] напоминает [napominaet = recalls; headword needed: напо́мнить = napomnit'] подешевел [podeshevel = it became cheaper; headword needed: дешеве́ть = deshevet'] подогревается [podogrevaetsia = is heated up; headword needed: подогреться = podogret'sia] веток [vetok = branch; headword needed: ветка = vetka]
Takes meaning from a nearby word	6	несущие [nesushchie = bearing] (finds: несущественный [nesushchestvennyi = insignificant]) увеличивается [uvelichivaetsia = increases] (finds: увеличи- [uvelichi-]) использовали [ispol'zovali = they used] (finds: использование [ispol'zovanie = use]) родина [rodina = homeland] (finds: родить [rodit' = to give birth]) существовать [sushchestvovat' = to exist] (finds: существенный [sushchestvennyi = significant]) растений [rastenii = plants] (finds: раст- [rast-])
Looks for proper noun/term (translation does not explain)	6	самовар [samovar] сбитень [sbiten' = sbiten] сбитенник [sbitennik = sbiten container]
Looks for a compound word	4	внеуличный [vneulichnyi = non-street] древнеегипетского [drevneegipetskogo = ancient Egyptian]
Struggles with alphabetical order	3	железная [zheleznaia = iron] появление [poiavlenie = appearance] оформление [oformlenie = design]
Other (Unclear why reader can not find the form)	5	кольце [kol'tse = ring] (possibly alphabetical order) шишками [shishkami = pine cones] (possibly parsing) остыть [ostyt' = to grow cold] (possibly alphabetical order) оставалось [ostavalos' = it remained] заложение [zalozhenie = foundation]
Total	45	

Readers also had problems dealing with the order of letters in the Cyrillic alphabet and this caused students to stumble in looking up words. This could happen not only with initial letters (*железный* [zheleznyi = iron]) but also for internal letters in *появление* [poiavlenie = appearance] and *оформление* [oformlenie = design, formation]. The letters *ж* [zh], *я* [ia] and *ф* [f] are the 8th, 33rd, and 22nd letters of the alphabet respectively, and their positions in the alphabet differ quite significantly from where corresponding English letters are located. Furthermore, sometimes readers overcame problems with alphabetical order and letter transposing, but they used a lot of time to find the right entry (e.g., Mark took three minutes to find the word *искусство* [iskusstvo]).

Research Question 3. Monitoring

The last column of Table 1 indicates the number of times readers verbalized their monitoring or integration of dictionary findings into the immediate context. After they had successfully found the dictionary entry, readers verbalized the integration of the word into the immediate context approximately three-fourths of the time (74%). Three readers were exceptional in this: Jane (who looked up few words and generally was a strong reader) did not monitor any of the words she looked up; Ann and Mark (who looked up many words and were generally weak readers) almost never monitored meanings. Their verbal protocols show little evidence that the found definition added to their understanding of the sentence. Dictionary use for them appears to be part of a word-by-word substitution approach to reading, without an effort to build a more comprehensive understanding of the text. It is possible that they were monitoring silently, although given the speed with which they went on to look up the next word, they would have had to do this very quickly.

Research Question 3. Qualitative Data About Monitoring

For students who did monitor meaning, Henry provides a very interesting example of its benefits. For him dictionary word retrieval and monitoring actually helps clarify the context and allows him to infer the meaning of additional words in the immediate context. For example, in reading the sentence “Самовар — устройство для кипячения воды и приготовления чая [=The samovar is an apparatus for the boiling of water and preparation of tea]” from ET text, he looked up the word *устройство* [ustroistvo] and at first found “arrangement, organization, lay out,” commenting “It doesn’t really make sense in this...” He then noticed a further definition and exclaimed: “Oh, apparatus. Oh, okay, an apparatus for ... кипячение [kipiachenie] which I am pretty sure is boiling, but just to make sure... [he pauses and considers looking up кипячение] So it’s an apparatus for boiling water. What else can you do with water in a samovar if you are making tea? So it has to be boiling, so I am not even going to bother with looking that one up.”

While Henry provides an example of how dictionary look up and monitoring can help expand the reader’s comprehension of the text, monitoring can also go very wrong. In dealing with the EM text’s phrase: “В СССР с начала строительства Метрополитена его станции создавались как пространственно протяжённый архитектурный комплекс монументальных сооружений большого общественного значения [= In the USSR from the start of the construction of the Metroliten, its stations were created as a spatially extended architectural complex of monumental buildings of great public significance].” Harriet looked up *создавались* [sozdavalis’] and found “to create ... or found” and monitored the meaning as “So in the Soviet Union ... with the beginning of the construction in the metropoliten in the subway ... um... like.... her stations um... were founded that” Misreading the word *как* [kak =as] as ‘that’ her understanding of the sentence starts to go off course. After a long search she finds a meaning for *пространственно* [prostranstvenno = spatially] and comments: “So spatial. Oh, so all this has to do with space. So the space... so they were, like, spaced out architecturally in the complex. Okay.” While Harriet has lexical meanings for most words here, she is unable to use grammatical information in the phrase to generate a more precise meaning. In the next piece of the sentence she looked up *сооружений* [sooruzhenii] and found the correct meaning “building,” although she did not remember the word *значения* [znachenii= meaning] commenting: “I feel like I should know what значения is.” With only some of the key words in place, she tried to

build the meaning of the whole sentence. I shall quote here all of her thinking so that the reader can see the incremental deformation of the text's meaning:

So they started, like, building this big, um... the big subway and it had... It created a lot of space and, like, buildings and everything were built around it. So maybe that's having to do with, like, the expansion of the city...and, like, because the, um..., because, like, the subway allowed them to expand a lot, and other buildings and things started building up around it.

Harriet retrieved words from the dictionary correctly, but not all the words that she really needed. She did monitor their meanings for the context, but by not noticing certain key words like the conjunction *как* [kak] and the grammatical information encoded in word endings, she went astray in her understanding of the sentence. She then compensated for her limited understanding of the text's language by adding details and logical connectors from her background knowledge about Moscow's growth in the Soviet period. The result is an understanding of the sentence that bears little resemblance to the original text's meaning.

DISCUSSION

This study confirms the findings of earlier research (Fraser 1999b; Hulstijn 1993) that readers vary greatly on their use of a dictionary during reading to uncover the meanings of unknown words, and readers do generally prioritize words to be looked up based on perceived relevance (which may include factors such as the number of times a word appeared in the text). Jane, the strongest reader in this set (based on comprehension scores reported elsewhere), looked up only three words over the two readings, while others looked up far more. Jane may be near or have reached that threshold of language and vocabulary knowledge where the dictionary did not add as much to her basic understanding of the text as it did for weaker readers. If so, this would be consistent with Knight's (1994) findings, where online dictionaries provided the greatest boost in comprehension to weaker students.

While strategic about which words to look up, readers were, perhaps, too categorical in applying some strategies. While focusing on unknown verbs is a reasonable strategy when reading narrative texts where one needs to follow the development of events, readers applied this same strategy to informational texts where it is distinctly less helpful. In these texts many main verbs were essentially synonyms for copula verbs (e.g., *являться* [iavliat'sia = to be], *существовать* [sushchestvovat' = to exist], *стать* [stat' = to become], *служить* [sluzhit' = to serve], *заключиться* [zakliuchit'sia = to be concluded]) and contributed little to the text's overall meaning.

The qualitative results for the first and third research questions hint at some causes for excessive dictionary use of the type documented by Prichard (2008). When only a few words in a narrow context are familiar to the reader, looking up only one or two completely unfamiliar words may not be enough for the reader to get a sense of the context. In these situations they may feel the need to verify whether partially familiar words do not have additional meanings that would better fit the still murky context. Beth's experience with *заливать* [zalivat'], described earlier, shows the vicious circle readers can land in: when unsure of the context, readers do not know what meanings of words are best; without knowing the exact meaning of many words in a sentence, they cannot be sure what the context is.

When readers look up only a restricted set of words in a dense portion of the text, they need to be especially certain to attend to grammar and other textual clues that will make their dictionary consultations as effective as possible. They also need to take into account what the remaining unlooked-up words may contribute to the passage's meaning. A healthy skepticism toward the unknown might have prevented some of Harriet's excess in applying background knowledge to fill in the text.

While it was not surprising that readers at this level would experience some problems uncovering dictionary headwords, it was rather surprising to see this could happen even when readers had encountered multiple forms of the same word in the text and when readers had the correct background knowledge that would permit full comprehension of the passage (cf. Mark and *веток* [vetok]). Readers' inability to parse textual words also suggests that they may not be tapping into much of the text's grammatical structure in trying to construct meaning.

The issue of dictionary usage and parsing raises a number of questions that should be examined in carefully designed comparison studies for a variety of languages. It seems likely that in this study access to an online dictionary that automatically parsed textual forms might not have increased readers' comprehension of the text, because they were often not attending to the grammatical relations between words. For a morphologically-rich language like Russian, where word order is extremely flexible, the automatic parsing of online dictionaries may encourage readers to bounce from word to word accumulating only a string of lexical meanings that may still represent the text's meaning poorly. There is also cause to wonder if intermediate-level readers, having become very reliant on the automatic parsing function of online dictionaries, will experience delays in learning to read such complex forms with the speed and comprehension that proficient readers and native speakers have.

PEDAGOGICAL RECOMMENDATIONS AND CONCLUSION

The findings of this study suggest a number of pedagogical interventions that can complement existing reading instruction over the course of an undergraduate major in Russian. Our textbooks' pre-reading and post-reading activities should be expanded to include having students deduce the dictionary headword for a set of key words in a text and then have them alphabetize those words for speedier look up. Regular practice along these lines can be incorporated into instruction from an early level, but they will become particularly valuable for students at the intermediate level and beyond. Even for teachers and students who think of paper dictionaries as a relic of the Dark Ages, regular training in recovering dictionary forms is a valuable skill for learners, since it requires them to read the grammatical context carefully, and it can provide them the opportunity to take a close look at a word, analyze its structure and form, break it into syllables, and pronounce it aloud. This kind of elaborative processing of a new word is a key ingredient for readers to learn words from reading (Hulstijn, 2001).

If teachers and students decide to skip the issue of parsing by using online dictionaries (e.g., <http://dict.rambler.ru> and <http://lingvo.yandex.ru>) that do this work for them, teachers will still need to help learners select and monitor the best word meaning for the context.ⁱⁱⁱ For this purpose, it may be helpful, depending on the text, to have students from the intermediate level onward notice certain high-frequency polysemous words (e.g., *заниматься* [zanimat'sia = to be occupied, to study, to do], *относиться* [otnosit'sia = to relate to, to refer to], *заключиться* [=zakliuchit'sia=to lock up, to imprison, to conclude]) and homonyms (e.g., *свет* [svet = light;

world; high society]; *стать* [stat' = to become; to begin; figure], *мир* [peace; world]). Instead of glossing such words with a context-appropriate definition or marginal gloss, a teacher could select two or three of the common meanings and ask learners to decide which of them seems to work for the context. This would help model for students how to use context precisely on the kind of words where it matters most.

When working on verbal aspect, teachers might have students look up the aspect pair for different words so that they get familiar with how different dictionaries record this information. This may help sensitize students to the range of places where they may have to look for derived imperfective verbs such as *заливать* [zalivat'] or *напоминать* [napominat'].^{iv}

In this study even the fastest users of the paper dictionary could only manage to look up roughly one word per minute, and the fastest retrievers (e.g., Ann) were not the best comprehenders, and they generally did little monitoring of a word's meaning in the text. Since looking up words and making sense of them in a text takes time, teachers may want to guide readers' look up behaviors by underlining the most relevant words for comprehending an unglossed or lightly-glossed text. Teachers might also recommend that readers divide their time into a pre-dictionary phase and then a dictionary phase, giving appropriate time limits for each phase. Even if vocabulary learning is not an explicit goal of a reading assignment, teachers should plan some kind of follow-up vocabulary tasks with those highly relevant words since Peters et al. (2009) have demonstrated the effectiveness of look-up plus targeted vocabulary tasks for learning vocabulary from reading.

This study of L2 Russian readers and dictionary use has shown that reader strategies when using dictionaries are quite varied and that even at a relatively advanced stage of language learning, readers may be missing certain lexical subskills that keep them from being truly independent users of the language. The present study should provide teachers with a useful description of what subskills readers may not completely control, and how this can affect their construction of a text's meaning. The descriptive data in this study sets a useful baseline against which future targeted research studies, whether conducted with online dictionaries or with specially glossed reading texts, can test hypotheses about readers and reference materials.

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ENDNOTES

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- ⁱ Two exceptions to the rule are Rosengrant (2007) which features one brief exercise to introduce advanced learners to monolingual dictionaries and Kagan, Akishina, and Robin (2002) which features a series of exercises introducing Russian heritage speakers to a main monolingual dictionary.
- ⁱⁱ One of the interesting details in Hulstijn, Holland, and Greidanus (1996) is that the participants using a paper dictionary looked up words less frequently than did those in the marginal gloss group, although when the participants, using a paper dictionary, did look up a word, they were more likely to remember it than the marginal gloss group. The researchers speculate that the time involved in finding the word and choosing the correct meaning for the context may have given these readers the opportunity for elaborated processing, a key factor in word learning.
- ⁱⁱⁱ Teaching readers to look at grammatical cues in the text may be even more critical for monitoring the results from on-line dictionary use, especially when learners may type in words that are spelled the same but have different stresses (e.g., *жи́ла* [zhila = vein]/ *жила́* [zhila = she lived], *по́вести* [povesti = stories]/ *повесті́* [povesti = to lead], *за́лом* [zalom = with a hall/ зало́м [zalom = break]) and different meanings.
- ^{iv} Although online dictionaries will often do this parsing for students and some paper dictionaries (e.g., Katzner, 1984) use derived imperfectives as headwords, major monolingual Russian dictionaries (e.g., Ozhegov, 1990) generally do not, and learners, especially those at the upper-levels who are engaged with Russian for the long haul probably require some instruction about dealing with these problems.

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APPENDIX

Parallel alphabetical table of words that readers prioritized for look up during the pre-dictionary phase, looked up and found in the dictionary phase and looked up and did not find during the dictionary phase. Words are listed in the forms found in the texts.

Words noted for lookup during pre-dictionary reading period	Words looked up and found during dictionary period	Words not found/multiple lookups
	арка	байховый
бочонки	беседка	
ввоз	близнец	
ведется	бочонки	ведётся
	везде	
витражи	вестибюли	веток
внеуличная		внеуличная (2 readers)
	возведение	
	глубокого	
	дальнейший	
	дешево	
	договор	
	договорить	
	доливают	
железная		древнеегипетского (2 readers) железная (2 readers) забурлить
	заведение	
	заимствованные	
	заклѹчен	заклѹчен (2 readers) заливают (3 readers) заложения
заливают		
заложения	заложения (2 readers)	
замечательный	замечательный (2 readers)	
	засыпать (2 readers)	
	затягивающий	затягивающий
звучит		
	земные	
	зодчество	
	изготовлен	
	изобретение	
	искусство	
		использовали кафельные
	кипятится	
	кипятком (2 readers)	
кипячение (2 readers)	кипячение (2 readers)	
		количество
	колонны	
кольце	кольцо (2 readers)	кольце
	комфортабельные	

Words noted for lookup during pre-dictionary reading period	Words looked up and found during dictionary period	Words not found/multiple lookups
московичей (2 readers)	лист (2 readers) массы множество москвичи набивали нагревалась (3 readers)	листья (2 readers)
наземный	наливают напиток (2 readers) напоминают (2 readers) напомнить	напоминает (2 readers)
оружейник оруженный освободило	непрерывно (2 readers) обычаев (2 readers) оказалось определяющий оруженник освободило	настоялся несущие
отличался относится относят относящихся отразились	отличалось относится относят	основателем оставалось остыть относится (2 readers) относят
память	отразились оформление (2 readers) оформлялись память пена побелеет поверхность поверхность (2 readers) поддувало	оформление
построено появился	поджигать подземный полукруга появились (3 readers) появление	подшевел подогревается полные
приближается	прекращалось (2 readers) прибор прибор (2 readers)	появление представить представляющий собой

Words noted for lookup during pre-dictionary reading period	Words looked up and found during dictionary period	Words not found/multiple lookups
прославляющий пространственно-протяжённый протяженный	прибыльным проектирование произведения пространственный протяжённость протяженный (2 readers)	растений
самовар (3 readers)	род родина роскошные (2 readers) самовар (2 readers)	родина самовар (2 readers) сбитенник (2 readers) сбитень связанный
семейство	семейство служить создавались (2 readers) сооружение (3 readers)	сороконожками
сороконожками столичная (2 readers)	стремились строительство строить сухой сушеные существовал таинственный	существовать
строительство	тёплый тоннель трапеза (2 readers) труба трубка	увеличивается
существовал	тяги увеличивается (2 readers) украшают улучшило упоминается употреблять устройство участвовали храм	шишками/шишек
темпов		
тяги увеличивается		