

Mariusz Piotr Kamiński

# THE CONTRIBUTION OF BILINGUALIZED ENTRIES AND VOCABULARY KNOWLEDGE TO THE LEARNER'S SUCCESS IN SENTENCE COMPLETION

## The Case of *jump* Verbs

**Abstract** This study examines the role of the BLD and the user's receptive vocabulary knowledge in making appropriate lexical decisions in a sentence completion task. Fifty-two advanced and low-proficiency learners were recruited for the study. They were asked to read a set of gapped sentences and fill in the blanks with semantically similar verbs, using a randomly assigned dictionary (either BLD or MD depending). A logistic mixed-effects regression model was developed in which a participant's choice of a verb was treated as a success or failure in the task. The model showed that the successful completion of the task significantly depended on the learner's vocabulary knowledge rather than on the type of dictionary. Likewise, another regression model (two-way ANOVA) revealed that the time taken to complete the task was significantly affected by learners' vocabulary knowledge but not by dictionary type.

**Keywords** bilingualized dictionary; equivalent; vocabulary; mixed-effects

## 1. Introduction

The learner's bilingualized dictionary (BLD) offers the best features of both mono- and bilingual dictionaries: an L2 definition and an L1 equivalent of the headword. The rationale behind this type of dictionary is to assist learners in understanding the English definition by providing them with "limited help in the mother tongue" (Reif, 1987, p. 153). An example of this approach is the entry for *crease* from an English-Polish dictionary (Phillips, 2002):

**crease** ... noun [c] **1** an untidy line on paper, material, a piece of clothing, etc. that is caused by not treating it carefully: *Your shirt needs ironing, it's full of creases* ... **zmarszczka, zagięcie**

In this entry, the meaning of *crease* is rendered by the English definition and example sentence, and a few equivalents in the learner's native language (Polish). An equivalent provided in such a dictionary can save the user a great deal of time, especially when it carries the same semantic overtones as the word defined. The role of the equivalent is to reassure the learner about the meaning conveyed by the definition (Abecassis, 2007). The risk of misunderstanding the meaning appears to be high in those definitions that are written with a controlled vocabulary, since they are claimed to be inefficient in differentiating finer shades of meaning (Stein, 1979). Grasping meaning differences between semantically similar words is crucial for learners striving to write accurate sentences.

However, contrary to the above assumptions, previous empirical studies (Lew, 2004; Kamiński, 2023) suggest that the effect of the BLD in word-in-context selection tasks is not as substantial as expected in comparison with the monolingual dictionary (MD). The present study examines whether using BLDs can make sentence completion task easier for a learner compared to MDs, and whether success in this task depends on the learner's vocabulary knowledge. Unlike Kamiński's earlier study (2023), the present research focuses on a different set of words and uses a different statistical method (mixed-effects model).

## 2. Research Questions

This study tested the effectiveness of the BLD in a gap-fill task requiring participants to make decisions on the choice of verbs to complete sentences. Each gap could be filled only by one of the near-synonyms for *jump*. The focus was on two research questions:

- Do dictionary type (BLD or MD) and learners' vocabulary knowledge influence:
1. the appropriateness of lexical choices in this task?
  2. the time taken to complete the task?

## 3. Method

The research questions were addressed by building two regression models, in which dictionary type (BLD and MD) and learners' vocabulary level (advanced and low) served as predictors.<sup>1</sup> The first model, a mixed-effects model, measured the appropriateness of lexical choice as the outcome variable (appropriate or inappropriate), while the second model measured the time taken to complete the task. The data were collected through a user-oriented study, in which each student gave repeated responses to a different sentence context.

### 3.1 Participants

Fifty-two undergraduate students of English Studies at the University of Applied Sciences in Nysa (Poland) participated in this research. They were all native speakers of Polish, with a minimum of 11 years of formal English instruction in schools within the Polish school system. Their level of English was estimated using a receptive vocabulary size test (Nation & Webb 2011). The test showed that participants' knowledge of vocabulary ranged between 4,500 and 14,400 word families, with the median being 9,750. Those learners whose vocabulary size was below 9,000 word families were classified as low-proficiency learners, while the others as advanced learners. Participants were randomly divided into two groups: one with a BLD, and the other with an MD at their disposal.

<sup>1</sup> The data preparation and statistical analyses were performed in R (R Core Team 2023).

### 3.2 Materials and Procedure

The task included 7 sentences from a proficiency-level coursebook (Stephens, 2002, p. 21), each with a gap to be filled with one of the target verbs: *creep, crouch, leap, lurk, pounce, scramble, stalk*. The verbs were potentially unknown to participants since they are rare in the language, and not included in their course curricula. An additional sentence, where none of the words fit, was added to minimize the effect of random guessing. Participants could earn a total of eight points, leaving one gap blank. The task featured a set of dictionary entries for the verbs, available in two versions: MD or BLD, depending on the student group.

The two versions shared identical monolingual content drawn from the *Longman Dictionary of Contemporary English, Writing Assistant Edition CD-ROM* (LDOCE4; Summers, 2005), except for the learners' L1 equivalents (drawn from *The New Kosciuszko Foundation Dictionary*; NKFD; Fisiak, 2003) exclusive to the BLD. An example of the BLD entries, along with the task sentence, is shown in Figure 1. The MD version of this entry had no right-hand panel. The entries were reduced to relevant senses only. The majority of the equivalents were one-word lexical units. Students completed the task, using either the MD or BLD entries depending on the assigned group. The task was administered online, using an HTML and PHP interface, with the task sentences and entries displayed on the same webpage. The experiment was conducted in a university computer room during normal class time. Learners' responses and completion times were collected in a MySQL database. Following the main task, participants were asked to take the vocabulary size test, which was also available on the web (VocabularySize.com, 2024).

The tiger ..... a small antelope through the long grass.

<b>stalk</b>	<p>[transitive] to follow a person or animal quietly in order to catch and attack or kill them [shadow]:  <i>Polar bears stalk seals that are resting on the ice.</i>  <i>We know the rapist stalks his victims at night.</i></p>	<p>śledzić, tropić; podchodzić (zwierzyńę, ofiarę).</p>
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**Fig. 1:** One of the task sentences and the corresponding BLD entry for *stalk*. The entry combines the monolingual English part (from LDOCE4) and the L1 equivalents (NKFD)

## 4. Results

### 4.1 Appropriateness of Word Choice

To address the first research question, a logistic mixed-effects model was developed, where each participant's lexical decision resulted in either success or failure (outcome variable). The model formula notation was as follows:

`glmer(Appropriateness ~ Dictionary + Vocabulary + ( 1|ID) + (1|Item), data = data, family = "binomial", control = glmerControl(optimizer = 'Nelder_Mead'))`

In this model, Appropriateness stands for the outcome variable, Dictionary and Vocabulary are the predictors, ID is a participant, and Item stands for a verb.

Table 1 outlines the learners' mean scores. Each participant could score a maximum of 8 points for accurate responses. The scores indicate that the BLD users made on average more appropriate lexical decisions than the MD users. Taking into consideration their vocabulary knowledge (Table 2), one can see that this variable seems to be an important factor determining learners' success in the task. Advanced learners performed better than low-proficiency learners, irrespective of the dictionary used.

**Table 1:** Descriptive statistics for the appropriateness of word choice

Dictionary	N	Mean	SD
MD	33	5.33	2.07
BLD	19	6.05	2.09

**Table 2:** Appropriateness of word choice by learners' vocabulary level and dictionary type

Dictionary	Vocabulary	N	Mean	SD
MD	advanced	22	6.0	1.57
	low	11	4.0	2.36
BLD	advanced	13	7.15	1.06
	low	6	3.66	1.75

The results of the logistic model are shown in Table 3. Of the two predictors, only the learners' vocabulary level ( $\beta = -2.16$ ,  $p < 0.0001$ ) had a significant effect on whether they chose verbs appropriately or not. In other words, for a learner with a limited vocabulary size, as compared to an advanced learner, the odds of being correct in this task decrease by a factor of 8.67 ( $e^{2.16}$ ).

**Table 3:** Model estimates and  $p$ -values

	Estimate $\beta$	SE	z-value	p-value
Intercept	1.78	0.52	3.44	< 0.001
Dictionary[BLD]	0.79	0.47	1.67	0.09
Vocabulary[low]	-2.16	0.48	-4.53	< 0.0001

The model assumed a lack of interaction between Dictionary and Vocabulary. A model that allowed the interaction was also fitted but the interaction was not significant. A likelihood ratio test comparing the two models showed that neither of them appeared to be better than the other ( $\chi(1) = 3.1$ ,  $p = 0.08$ ). Another likelihood ratio test showed that the fitted model is significantly better than a simple logistic model without random effects (AIC = 410 vs. 468). It accurately predicts the appropriateness of word usage 85% of the time in the data modeled. The predicted probabilities of appropriate word choice are illustrated in Figure 2. As can be seen, only advanced learners are

predicted to provide successful responses in this task, while the probability of success for low-proficiency learners is less than chance. This means that dictionary type is a rather poor predictor of the task success.

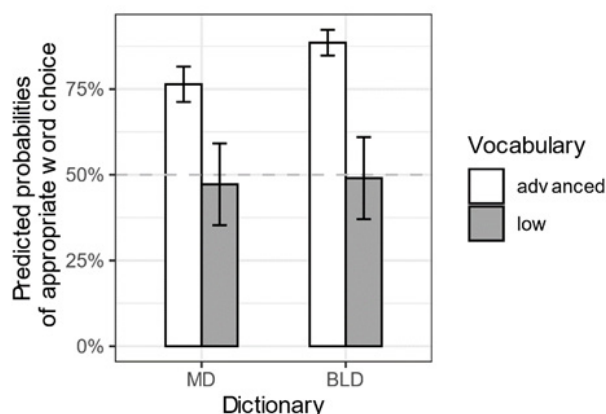


Fig. 2: Predicted probabilities of appropriate word choice by dictionary type and vocabulary level

## 4.2 Time Taken to Complete the Task

With respect to the second research question, a two-way ANOVA was conducted to estimate task completion time based on the same predictor variables: Dictionary and Vocabulary. The model allowed for an interaction between the predictors, as suggested by the distribution of times in Figure 3. The figure shows that only advanced learners took advantage of the BLD, since they completed the task faster than less competent learners, and, as indicated in Table 2, they achieved higher scores in word selection (7.15 vs. 6.00). However, the effect of dictionary on time was not significant ( $p > 0.05$ ), according to the model (see Table 4). Table 4 indicates that time is significantly influenced by learner's vocabulary level ( $p < 0.05$ ,  $\omega^2 = 0.08$ ). Advanced learners need less time to fill in sentence gaps than intermediate learners.<sup>2</sup>

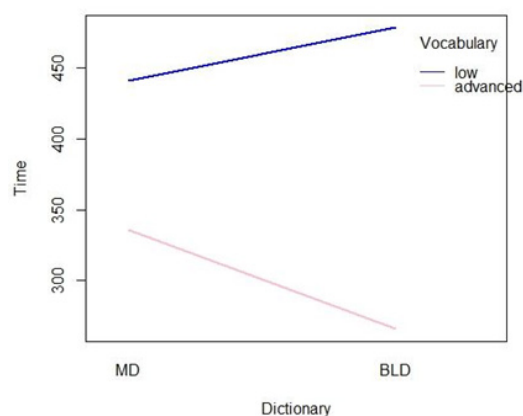


Fig. 3: Entry consultation time (in seconds) by dictionary type and learners' vocabulary level

<sup>2</sup> The design of this study did not allow us to separate the actual entry consultation time from the task completion time, as both activities are typically done concurrently. It follows that one cannot rule out the possibility that some learners, particularly the very advanced ones, filled the sentence gaps without consulting the entries. Using a more sophisticated approach, such as eye-tracking, would provide insight into whether this was the case.

**Table 4:** The ANOVA output estimates and *p*-values

	<i>Df</i>	Sum Sq	Mean Sq	<i>F</i> value	<i>p</i> -value
Vocabulary	1	156661	156661	5.53	<b>0.02</b>
Dictionary	1	820	820	0.03	0.87
Vocabulary:Dictionary	1	2033	2033	0.07	0.79
Residuals	48	1360573	28345		

### 4.3 Conclusions

This study explored the contribution of dictionary type and learners' vocabulary knowledge to making appropriate lexical choices in the sentence completion task. The following are the answers to the research questions:

1. Learners' vocabulary knowledge significantly contributes to making appropriate decisions on the choice of verbs for sentence gaps. Advanced learners performed significantly better than low-proficiency learners. The task success was not significantly affected by whether participants used BLD or MD.
2. The time taken to complete sentences was significantly affected by learners' vocabulary knowledge, with advanced learners choosing the verbs faster than the less competent students. No significant effect of dictionary type on the task completion time could be shown.

From the findings, it transpires that the knowledge of English vocabulary is more crucial than the choice between a BLD or an MD in tasks requiring the ability to distinguish between semantically similar verbs. The findings not only underline the importance of learners' profiles, in this case their proficiency level, but also cast light on the rather limited role of BLDs in this particular task. In evaluating this role, one cannot evaluate the usefulness of the dictionary in separation from such factors as the learner's profile and the type of task at hand. The experiment was conducted on a modest selection of verbs and with one particular pair of languages, so further research is needed to see whether the findings can be generalized to a wider population.

Finding (1) supports the conclusion reached in the earlier study by Kamiński (2023) that neither the BLD nor the MD shows a significant advantage over the other in the word-in-context selection task. However, in contrast to the previous study, finding (2) revealed that the learner's vocabulary had a significant impact on task completion time.

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## Contact information

**Mariusz Piotr Kamiński**

Department of Foreign Languages, University of Applied Sciences in Nysa, Poland  
mariusz.kaminski@pans.nysa.pl

