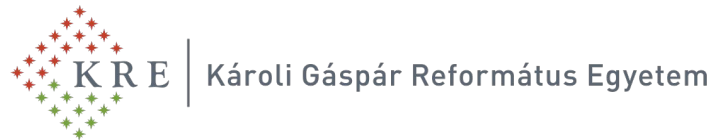


eLex 2023

Exploring the Capabilities of ChatGPT for Lexicographical Purposes: A Comparison with Oxford Advanced Learner's Dictionary within the Microstructural Framework

Chayanon Phoodai
Richárd Rikk



Conversation with ChatGPT

Can you replace dictionaries?

Well, as an AI, **I could try replacing dictionaries**, but I have to warn you, **my definitions might be a little... unconventional**. For example, instead of "cat," I might define it as "**a fluffy, four-legged creature that secretly plots to take over the world with its irresistibly cute face.**" [..]

So, while I can offer some entertainment and humor, I wouldn't recommend relying on me as your sole source of accurate definitions. If you're looking for reliable information, it's always a good idea to have a good ol' fashioned dictionary handy. Plus, flipping through its pages can provide a much-needed break from the digital world!

(excerpt from ChatGPT, May 2023)

Conversation with ChatGPT

Can you replace dictionaries?

As an AI language model, **I can provide information and assistance similar to a dictionary, but I cannot fully replace dictionaries.** Dictionaries serve as comprehensive reference books that contain a vast amount of information, including word definitions, spellings, pronunciations, etymologies, and more. While I can offer definitions and explanations, **I may not always have the same level of detail or accuracy as a dedicated dictionary.**

[...]

Aim

To what extent is ChatGPT capable of providing data related to various lexicographical items?

Agenda

- 01** **Methodology**
- 02** **Results**
- 03** **Conclusions &
Future Work**

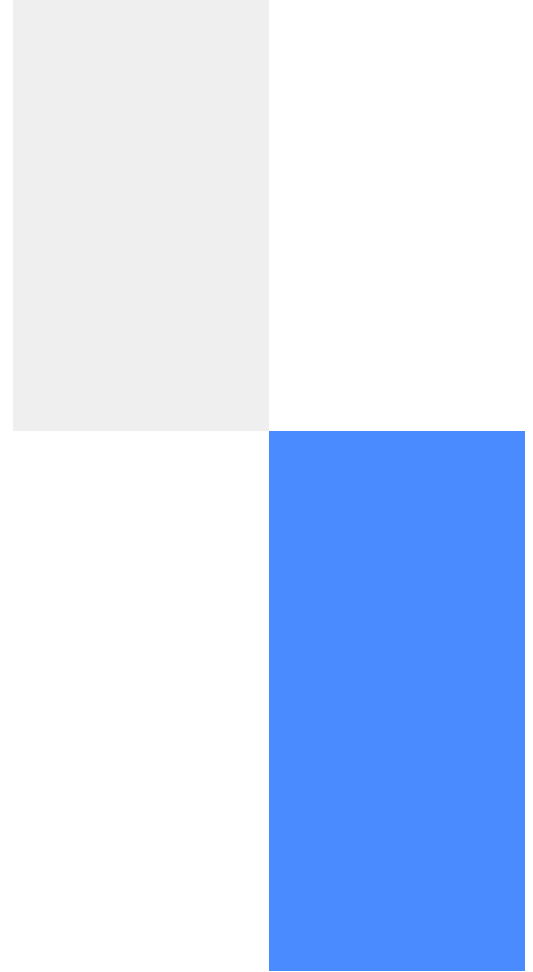


01

Methodology

Methodology

1. **Corpus and Lemma Selection**
2. **Wiegand's Item Classes (1989)**
3. **Lexicographical Prompts**
4. **Datasets**
5. **Manual Analysis**
6. **Similarity Scores**



1. Corpus and Lemma Selection

- British National Corpus (BNC)
- ten most frequently used words from five parts of speech: noun, verb, adjective, adverb, and preposition
- 50 lemmas were selected

2. Wiegand's Item Classes

- general and learner's dictionary
- 8 item classes → 41 lexicographical items
- adapted and simplified by Engelberg & Lemnitzer (2009:157)
- criteria for microstructural evaluation

3. Lexicographical Prompts

- Prompt engineering → effective communication with LLMs like ChatGPT
- Prompts serve as instructions to enforce rules, automate processes, and ensure specific qualities and quantities of output
- Prompts for lexicographical purposes are currently understudied

1st Attempt

Provide dictionary information for "time"

Sure, here is the dictionary information for the word "time":

noun

1. as a measurement, "time" refers to a duration or a quantity that is measured in units of seconds, minutes, hours, days, weeks, months, years, or other units depending on the context.
2. the duration of a particular event or situation.

verb

1. to measure or record the speed, duration, or rate of.
2. to adjust (a mechanism) so as to synchronize its operation with a timing device or with a sequence of operations.

(excerpt from ChatGPT, March 2023)

3. Lexicographical Prompts (2)

Provide ten concise prompts or templates that can make you do lexicographical tasks.

Sure, here are ten concise prompts or templates for lexicographical tasks:

1. Define the word [insert word here].
2. Create a list of synonyms for [insert word here].
3. Provide an antonym for [insert word here].
- ...
10. List three words that are derived from [insert word root here].

(excerpt from ChatGPT, March 2023)

4. Datasets

- The data is stored in two primary tables

Manual Analysis

1. 50 lemmas
2. 41 lex. items
3. *present or absent*

Similarity Scores

1. 50 Lemmas
2. 5 lex. items
3. actual/textual responses from ChatGPT and OALD

5. Manual Analysis

- The result is based on eight item classes as criteria (Wiegand, 1989).
- Examining whether ChatGPT and OALD are capable of providing data related to the corresponding lexicographical items
- The capabilities/availability of the data are calculated and presented in percentage.

6. Similarity Scores

- BLEU: Bilingual Evaluation Understudy
- ROUGE: Recall-Oriented Understudy for Gisting Evaluation
- Only 5 lex. items are considered.
- The scores do NOT indicate the quality of the answers, but only the alignment/similarities.

02

Results

1. Manual Analysis
2. Similarity Scores

Manual Analysis

Lemma Sign

Lexicographical Item	Lemma Count	ChatGPT	OALD
Item giving the form of LES	50	100%	100%

Manual Analysis (2)

Phonetic-Phonological and Orthographic Information

Lexicographical Item	Lemma Count	ChatGPT	OALD
Pronunciation	50	100%	100%
Accent	50	14%	–
Vowel quantity marker	50	100%	–
Syllable	50	14%	–
Spelling	50	100%	100%
Syllable division	50	14%	–

Manual Analysis (2)

Phonetic-Phonological and Orthographic Information

Provide pronunciation for "people".

The pronunciation of "people" is generally the same in both **American and British English**. It is pronounced as **\ 'pi:pl \ (PEE-pul)** with stress on the first syllable in both dialects.

(excerpt from ChatGPT, March 2023)

Manual Analysis (3)

Morphological Information

Lexicographical Item	Lemma count	ChatGPT	OALD
Inflexion	40	77.5%	42.5%
Degrees of comparison	20	55%	20%
Compound	50	100%	20%
Word family	50	100%	20%
Number	10	20%	4%

Manual Analysis (3)

Morphological Information

Provide degrees of comparison for "good"

The degrees of comparison for "good" are:

- Positive degree: good
- Comparative degree: better
- Superlative degree: best

(excerpt from ChatGPT, March 2023)

Manual Analysis (4)

Syntactic Information

Lexicographical Item	Lemma count	ChatGPT	OALD
Part of speech	50	100%	100%
Valency	10	100%	100%
Adjective distribution	10	100%	100%

Manual Analysis (4)

Syntactic Information

Provide valency for verb "do"

The verb "do" is a **transitive verb** and its **valency is 2**, which means it requires two arguments to form a complete sentence. The first argument is the subject of the sentence, and the second argument is the object that receives the action of the verb.

[Example sentences]

...

(excerpt from ChatGPT, March 2023)

Manual Analysis (5)

Syntactic-Semantic Information

Lexicographical Item	Lemma Count	ChatGPT	OALD
Collocation	50	100%	36%
Phraseme	50	100%	84%
Proverb	50	100%	26%
Example	50	100%	100%
Usage example	50	100%	–
Citation text	50	–	100%
Reference of the citation	50	–	–

Manual Analysis (6)

Semantic Information

Lexicographical Item	Lemma Count	ChatGPT	OALD
Meaning	50	100%	100%
Synonyms	50	100%	26%
Antonyms	50	100%	2%
Polysemy	50	100%	100%
Illustration	50	–	+
Equivalent	50	–	–

Manual Analysis (6)

Semantic Information

Provide illustration for "man"

I'm sorry, but I cannot provide illustrations as I am a **text-based AI language model**. An illustration for the word "man" could be a drawing, painting, or photograph that depicts a male human being. The illustration could show a man in a specific context, such as at work, at home, or in a social setting. It could also show a man in different stages of life, such as a young boy, middle-aged man, or elderly man. The purpose of the illustration is to provide a visual representation of the word "man" to help readers understand and visualize its meaning.

(excerpt from ChatGPT, March 2023)

Manual Analysis (7)

Pragmatic Information

Lexicographical Item	Lemma Count	ChatGPT	OALD
Diatechnic labelling	50	+	2%
Diastratic labelling	50	-	12%
Diafrequency labelling	50	100%	+
Diaevaluative labelling	50	100%	16%
Diachronic labelling	50	+	22%
Diatopic labelling	50	+	48%
Diintegrative labelling	50	-	+
Dianormative labelling	50	-	10%
Diatextual labelling	50	-	20%
Diamedial labelling	50	100%	+

Manual Analysis (8)

Other Items

Lexicographical Item	Lemma Count	ChatGPT	OALD
Etymology	50	100%	100%
Cross-reference	50	–	100%

Manual Analysis (8)

Other Items

Provide word origin for "child"

The word "child" comes from the Old English word "cild", which meant "a fetus, an infant, or a young person". The word is thought to be derived from the Proto Germanic word "*kiltham", which meant "womb" or "uterus." This word is related to the Old Norse word "kildr" and the German word "Kinder".

(excerpt from ChatGPT, March 2023)

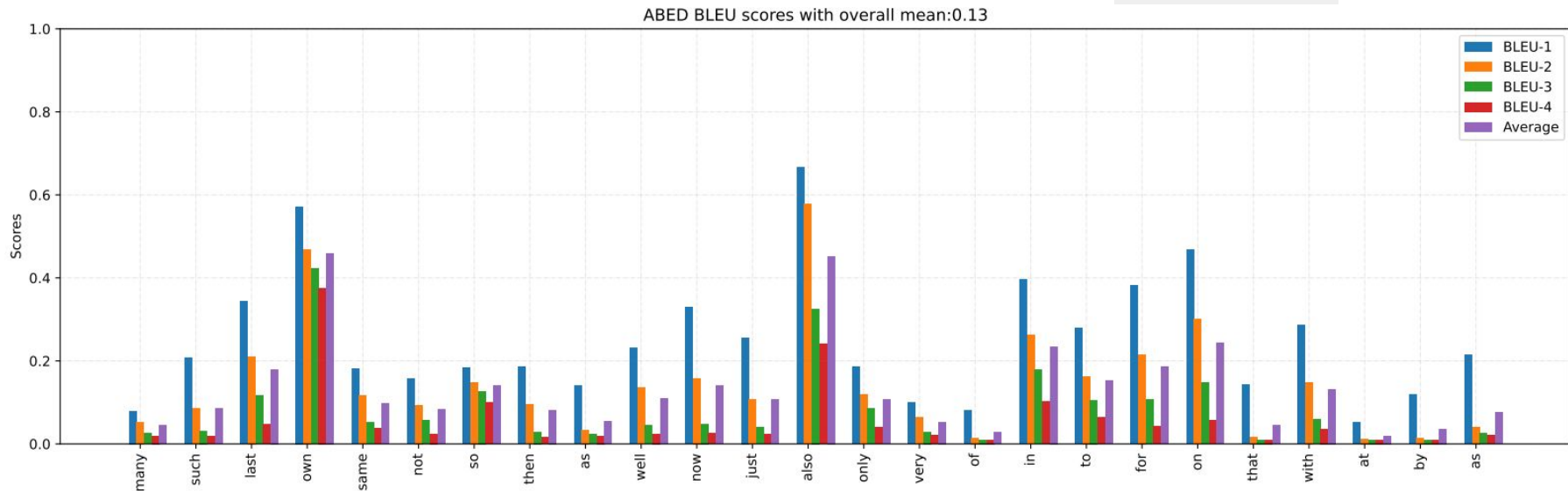
Manual Analysis (9)

Additional Lexicographical Features

Lexicographical Item	Lemma Count	ChatGPT	OALD
CEFR level	50	100%	100%
Topic	50	+	100%
Abbreviation	50	10%	10%
Cultural Information	50	+	2%
Political statement	50	+	2%
Notes on usage	50	+	28%

Similarity Scores

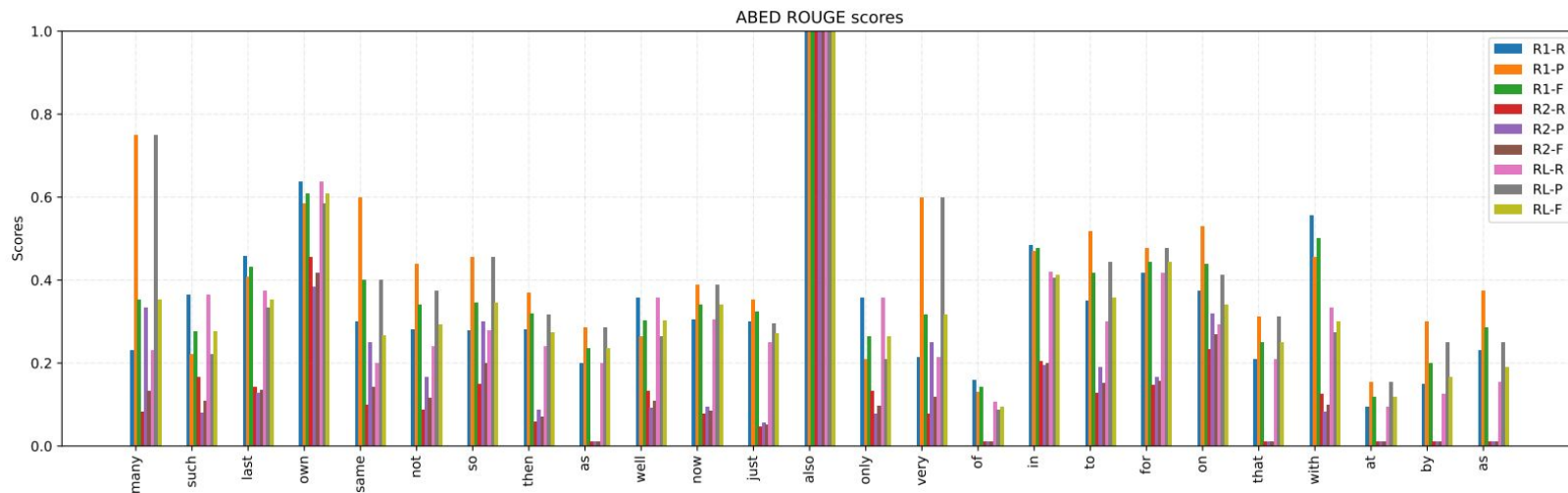
BLEU scores



Similarity Scores (2)

ROGUE scores

R	Recall
P	Precision
F	F1 Score



Similarity Scores

Lemma	ChatGPT	OALD
also	in addition; too	in addition; too
child	<ul style="list-style-type: none">• a young human being below the age of puberty• a son or daughter of any age• a person who is not very experienced or who is easily influenced	<ul style="list-style-type: none">• a young human who is not yet an adult• a son or daughter of any age• a person who is strongly influenced by the ideas and attitudes of a particular time or person
own	used to emphasize that something belongs or relates to the person or thing mentioned	used to emphasize that something belongs to or is connected with somebody

(Examples of the data provided regarding item giving meaning)



03

Conclusions & Future Work

Conclusions

Item Class	Average Score	
	ChatGPT	OALD
LES	100%	100%
PPOI	57%	33%
MOI	71%	21%
SYI	100%	100%
SYSI	71%	49%
SEMI	67%	38%
PRAI	30%	13%
OTI	50%	100%
<i>Total</i>	68%	57%

- Higher similarity scores are achieved when evaluating candidate texts at the unigram level
- Longer word units tend to receive lower scores.

Future Work

- Further research is needed on ChatGPT as a learner's dictionary, including lexicographical prompts, evaluation criteria, comparisons with other dictionaries, and accuracy assessment.
- Despite limitations, ChatGPT shows promise as a language learning tool and lexicographic aid for EFL learners.



Károli Gáspár Református Egyetem



**Thank you
for your attention!**

References

- Engelberg, S. & Lemnitzer, L. (2009). *Lexikographie und Wörterbuchbenutzung: Stauffenburg-Einführungen*. Stauffenburg (Tübingen).
- Hornby, A.S. (2019). Oxford advanced learner's dictionary. URL <https://www.oxfordlearnersdictionaries.com/definition/english/>.
- OpenAI (2023). ChatGPT. <https://openai.com/blog/chatgpt>.
- Wiegand, H.E. (1989). Der Begriff der Mikrostruktur: Geschichte, Probleme, Perspektiven. In *Handbücher zur Sprach- und Kommunikationswissenschaft*, volume 1. Berlin: Walter de Gruyter, pp. 409–462.
- Wiegand, H.E., Beißwenger, M., Gouws, R.H., Kammerer, M., Storrer, A. & Wolski, W. (2010). Wörterbuch zur Lexikographie und Wörterbuchforschung. *Berlin/New York*.