

Mapping Vocabulary Size Across Frequency Levels: Case of a Japanese Learner of English

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ABSTRACT

Vocabulary knowledge has been consistently identified as central to second language proficiency and as a strong predictor of language performance. This study investigated the vocabulary size of a Japanese Learner of English (JLE) by examining her performance on the Vocabulary Size Test (VST) alongside a language needs assessment. Drawing on the Lexical Threshold Hypothesis and research on vocabulary size and lexical coverage, the study explored how the informant's vocabulary knowledge was distributed across frequency levels and how her instructional background and language needs were reflected in her vocabulary size estimate. Results indicated that she currently has a vocabulary size of 7,400-word families, obtained the highest scores at high-frequency word levels,

and had variable and declining performance at mid- and low-frequency levels. While this size suggests sufficient coverage for basic spoken discourse and simpler texts, it falls below the thresholds associated with unassisted comprehension of advanced academic and literary texts. Item-level analysis revealed that incorrect responses may have been shaped by classroom-emphasized meaning-inferencing strategies, which contrasted with her reported profile. Moreover, it was found that the majority of the incorrectly answered items involved nouns, particularly abstract concepts or institutional terms that are less likely to appear in everyday conversations. These findings highlight the importance of interpreting vocabulary size estimates in relation to the learners' profiles and needs, and suggest that mid- and low-frequency vocabulary development should be prioritized to support academic and professional language use.

Keywords: *Vocabulary Size, Lexical Threshold, Word Frequency Levels, Receptive Vocabulary Knowledge, Lexical Coverage*

INTRODUCTION

Vocabulary size has been consistently linked to broader language needs in second language acquisition (SLA) while lexical threshold has been central to understanding language proficiency (Nation, 2006; Laufer & Ravenhorst-Kalovski, 2010; Schmitt et al., 2017). Research on lexical coverage further demonstrated that learners must reach certain vocabulary thresholds, typically 95% to 98% coverage, to achieve adequate comprehension of spoken and written texts (Hu & Nation, 2000; Nation, 2006, in Ibrahim et al., 2016). However, scholars had varying interpretations of how such thresholds operate, with some treating them as fixed cut-off points and others emphasizing their probabilistic nature and sensitivity to learner-specific factors such as proficiency, instructional background, test modality, and first language influence (Laufer & McLean, 2016). These issues are especially evident in research on Japanese learners of English (JLE), who, despite extended formal instruction, often demonstrate strong command of

high-frequency vocabulary but limited control over mid- and low-frequency lexical items necessary for academic engagement, with additional complications arising from reliance on reading strategies, loanword effects, and discrepancies between receptive and productive vocabulary knowledge (Uchihara & Harada, 2018; Ishikawa et al., 2024). While vocabulary size tests have been widely used to estimate lexical knowledge, less attention has been paid to how individual learners' test performance reflects their language learning experiences, strategic behaviors, and reported language needs. It is within this gap that this current study situated itself, as it examined the vocabulary knowledge of a JLE through a detailed analysis of Vocabulary Size Test performance across frequency levels, interpreted in relation to her language needs profile, instructional context, and reliance on external support, in order to provide a more nuanced account of how vocabulary size estimates align with actual lexical competence.

Language proficiency and vocabulary knowledge

Studies in applied linguistics have recognized and broadly agreed that vocabulary knowledge is an indispensable component of second language proficiency and that it can predict learners' comprehension and language production (Nation, 2006; Laufer & Ravenhorst-Kalovski, 2010; Schmitt et al., 2017). In fact, scholars (e.g., Bernhardt & Kamil, 1995, in Laufer and Ravenhorst-Kalovski, 2010; Qian, 2002, in Laufer and Ravenhorst-Kalovski, 2010; Laufer & McLean, 2016) had consistently proved that learners with larger vocabularies tend to achieve higher levels of academic success and overall language proficiency, particularly in reading comprehension and academic discourse.

However, while early views treated vocabulary as a direct prerequisite for comprehension (Mezynski, 1983, in Hu & Nation, 2000), later research emphasized that vocabulary interacts with other cognitive, linguistic, and experiential factors, such as world knowledge, reading strategies, and first language literacy (Hu & Nation, 2000). Consequently, vocabulary knowledge is now understood not merely in terms of quantity but also in terms of quality, including depth of knowledge, accessibility, and the ability to utilize lexical items productively (Read, 2000, in Laufer & McLean, 2016; Uchihara & Clenton, 2020).

Despite these contentions, studies converge on the claim that insufficient vocabulary knowledge constrains learners' ability to meaningfully engage with L2. Sen and Kuleli (2015) claimed that between vocabulary breadth and depth, it was the latter that predicted reading performance better. Moreover, vocabulary size has been shown to predict placement outcomes, academic readiness, and success in English-medium instruction (EMI) contexts (Uchihara & Harada, 2018; Roche et al., 2016, in Uchihara & Harada, 2018). At the same time, discrepancies between receptive and productive vocabulary knowledge are widely documented (Laufer & McLean, 2016; Uchihara & Harada, 2018), particularly among low-proficiency learners and those in foreign language contexts. These findings suggest that vocabulary knowledge, while essential, manifests unevenly across skills and contexts, which compels scholars and academics to be careful with assessment and interpretation.

The Lexical Threshold Hypothesis

The relationship between vocabulary knowledge and comprehension can be explained by one influential framework, the Lexical Threshold Hypothesis. This hypothesis posits that learners must reach a minimum level of lexical coverage before adequate comprehension becomes possible (Laufer, 1992, in Laufer & Ravenhorst-Kalovski, 2010; Hu & Nation, 2000). Lexical coverage refers to the percentage of running words in a text that a reader understands, and it has been widely used as an index for determining the vocabulary demands of different text types (Nation, 2006, in Hamada et al., 2024). Research generally agrees that approximately 95% coverage represents a minimal threshold for basic comprehension, while 98% coverage is required for unassisted and fluent reading, particularly of authentic texts such as newspapers and novels (Hu & Nation, 2000; Nation, 2006, in Hamada et al., 2024; Schmitt et al., 2017). These coverage levels have been translated into vocabulary size estimates, with 6,000-7,000 word families often cited as necessary for listening comprehension and 8,000-9,000 word families for reading

comprehension of written texts (Nation, 2006, in Hamada et al., 2024; Schmitt & Schmitt, 2014, in Hamada et al., 2024).

Nevertheless, scholars disagree on how to approach the concept of these thresholds. Some studies regard lexical thresholds as cut-off points for comprehension, while others view them as probabilistic boundaries, where comprehension improves gradually as vocabulary development occurs (Hu & Nation, 2000). Laufer and Ravenhorst-Kalovski (2010) showed that small improvements in lexical coverage at mid-frequency levels can yield a disproportionately large augmentation in comprehension.

Most importantly, the Lexical Threshold Hypothesis has been proven by group-level data, raising questions about how individual learners experience and negotiate lexical demands. Learner-specific factors such as proficiency level, instructional background, test modality, and first language influence may mediate how vocabulary knowledge translates into actual comprehension and performance (Laufer & McLean, 2016).

The case of Japanese learners of English in EFL and ESL settings

Despite years of formal instruction, vocabulary acquisition has been challenging for Japanese learners of English (JLEs). Uchihara and Harada (2018) noticed that Japanese students often fail to reach sufficient proficiency levels in English due to limited vocabulary knowledge. This finding resonated with Schmitt et al. (2017, in Uchihara & Harada, 2018), who argued that an ideal vocabulary size of 8,000-9,000 is required to comprehend authentic materials across genres. In another study, it was found that although JLEs know more than 70% of verbs in the New JACET 8000, their unfamiliarity with low-frequency words revealed persistent gaps in lexical development (Ishikawa et al., 2024; Uchihara & Clenton, 2020). These findings suggest that vocabulary difficulty cannot be attributed to frequency alone.

Additionally, research highlights substantial discrepancies between receptive and productive vocabulary knowledge among Japanese learners. Hamada et al. (2024) found that learners could recognize an average of 3,799 word meanings but could recall only 2,345, highlighting the discrepancy between recognition and recall. Laufer and McLean (2016) also found that while learners may recognize word meanings in written or multiple-choice formats, they often struggle to recall or use these words accurately in speaking and writing. Nation (2006, in Hamada et al., 2024) echoed these findings as he emphasized that learners must acquire 95-98% lexical coverage to adequately comprehend spoken and written discourse. These studies highlight that JLE's vocabulary is quantitatively limited and qualitatively disproportionate, particularly in productive skills, which hinders their ability to thrive in both EFL and ESL contexts.

What further complicated vocabulary assessment outcomes among JLEs was the intervention of loanwords derived from English, as they may have inflated vocabulary size estimates without accurately reporting depth of knowledge, particularly in recall-based measures (Laufer & Ravenhorst-Kalovski, 2010).

The present study

While previous research has established thresholds for reading comprehension (Hu & Nation, 2000; Laufer & Ravenhorst-Kalovski, 2010), examined disparities between recognition and recall (Hamada et al., 2024), and highlighted the role of aural vocabulary in EMI success (Uchihara & Harada, 2018), few studies have investigated how these findings translate to younger learners in secondary education. Existing studies focused on university students or adult participants (e.g., Ishikawa et al., 2024; Laufer & McLean, 2016), leaving the needs of adolescent learners underexplored. In addition, although the Vocabulary Size Test has been widely used to estimate learners' lexical knowledge, fewer studies have examined item-level response patterns in relation to learner strategies, instructional backgrounds, and reliance on external support such as translation tools. Moreover, factors such as motivation, learning preferences, learning strategies, and perceived difficulties in English, which are crucial for understanding language needs, are overlooked due to the reliance on vocabulary size tests alone.

The current study addressed this gap by examining the English language needs of an eighth-grade Japanese learner of English who struggles with comprehension and production. Through the combination of Nation and Beglar's (2007) Vocabulary Size Test and a needs-analysis questionnaire (adopted from Kaskani et al., 2021), the study problematized the adequacy of vocabulary size alone as a measure of proficiency. Guided by the Lexical Threshold Hypothesis and informed by research on Japanese EFL learners, this study sought to contribute to ongoing discussions on the validity and interpretation of vocabulary assessment results. In doing so, it highlighted the importance of situating quantitative vocabulary measures within learners' instructional contexts, strategic behaviors, and affective experiences, thereby offering implications for both vocabulary assessment and pedagogy.

Finally, it sought to answer the following questions:

1. What is the learner's English vocabulary size as measured by Nation and Beglar's Vocabulary Size Test (VST)?
2. How does the learner's vocabulary size reflect the distribution of word knowledge across frequency levels?

METHODS

Research Design

The current study used a case study design. Coombs (2022) defines a case study as a "methodological research approach used to generate an in-depth understanding of a contemporary issue or phenomenon in a bounded system." This research design was deemed appropriate by the researcher to gain a deeper understanding of the language needs and vocabulary size of a Grade 8 Japanese learner of English (JLE) to be referred to as "the informant." Moreover, it provided opportunities to explain the real-life context and issues of the informant, who was currently struggling with the productive skills required in subjects taught in English.

Research Locale

This study was conducted at the De La Salle Santiago Zobel School (DLSZ). It is a private basic education institution located in Muntinlupa City, National Capital Region. The school prides itself on being a trailblazer of Integrated Challenge-Based Learning, a "future-proof" educational blueprint that is "in sync with the student's developmental stages." Hence, the current study explored whether the informant, who was currently enrolled in the institution, had the vocabulary size expected of her age or level.

Sampling Technique

The current study included only one (1) research participant, to be called "the informant." She is a 14-year-old student who is enrolled at De La Salle Santiago Zobel School (DLSZ) as a Grade 8 learner and had been studying at the institution since grade school. She was born to Japanese parents, both of whom are Japanese nationals, and she had been living in the Philippines for more than ten (10) years at the time of the study.

The informant communicated with her parents primarily in Nihongo, which served as her home language. Although her father was capable of speaking English, he did not formally teach her the language. The informant began learning English formally at around six (6) years old, and her exposure to English occurred exclusively through school instruction. She did not receive private tutoring nor home-based instruction in English, and her English language learning was limited to interactions with teachers in the classroom.

Given that her exposure to English was confined largely to the academic setting, she demonstrates reliance on a translator device whenever she accomplishes tasks that are in English. At the time of the study,

the informant knows three languages, namely Japanese, English, and Filipino, with Japanese being her dominant language.

RESULTS AND DISCUSSION

Informant's profile and identified language needs

The informant of this study is a Japanese Learner of English (JLE) who is currently in Grade 8. She reported engaging with English exclusively within the confines of formal instruction. This limited exposure situates English as primarily an academic subject rather than a communicative resource, and this could be a factor that has been shaping her motivation and perceived difficulties. Similar profiles have been documented in EFL contexts, particularly among Japanese learners, where extended formal instruction does not necessarily result in functional communicative proficiency due to limited authentic exposure and use (Uchihara & Harada, 2018).

Her motivation to study English reflected short and long-term goals. Her primary reasons for studying relate to achieving good grades, securing future employment, and an explicit recognition of English as an international language. This orientation is consistent with instrumental motivation commonly reported among Japanese learners of English, where English is valued for academic advancement and future utility rather than immediate communicative needs (Ishikawa et al., 2024).

Her preferred topics aligned with youth-oriented discourse: friends, free time, traveling, environment, music, and the internet. These preferences offered stark contrast to her reported difficulties in productive skills, which suggests that her performance might not be due to lack of interest but rather to linguistic insecurity and skill-specific challenges. Previous research has shown that even when learners demonstrate topic familiarity and interest, insufficient lexical resources, particularly beyond high-frequency vocabulary, can constrain their ability to engage productively with such content (Nation, 2006, in Hamada et al., 2024; Laufer & McLean, 2016).

In terms of learning style preferences, the informant reported positive attitudes toward receptive activities such as listening to English songs, reading texts, studying grammar rules, and completing vocabulary exercises. She also values pronunciation drills and listening activities and prefers to do these tasks individually rather than collaboratively. Conversely, she expressed dislike for writing tasks, project-based learning, pair or group work, and problem-solving. This pattern suggests that the informant is comfortable engaging with predictable tasks and may experience anxiety or cognitive overload in socially exposed activities.

Her self-reported learning strategies further supported this profiling. She favors individual and whole-class work more than pair or group work. Vocabulary learning preferences are uniformly low across modalities, which suggests that vocabulary acquisition may be tedious for her regardless of learning method. She showed higher tolerance for studying grammar, especially when done with home-based assignments, possibly because these allow more time.

The aptitude and skill-difficulty data points revealed a consistent pattern of perceived deficiency. Writing emerged as the most problematic skill for her, in particular, syntax, diction, and organization. Speaking was also perceived to be difficult. She reported having anxiety about making mistakes, pronunciation problems, and difficulty interacting with others. Reading presented challenges as well, as she reported rarely inferring the meaning of unknown words. Listening was relatively less problematic, although it did not remain as effortless.

A particularly important finding was the informant's use of translator devices. She expressed that she has been using it for comprehension and production of schoolwork and expressed satisfaction with its output. Moreover, she reported increased confidence and task completion when a translator is available and does not view its utilization as cheating. This reliance suggests that it functions as a compensatory strategy that mitigates anxiety and enables task completion in the absence of sufficient linguistic resources. While this practice supports academic functioning, ultimately, it may reduce opportunities for developing

inferencing skills, lexical knowledge, and syntactic control, especially given her already limited engagement with English beyond the classroom.

Informant's vocabulary size as measured by the VST

Table 3 shows the raw scores of the informant for each of the frequency levels of Nation and Beglar's (2007) Vocabulary Size Test (VST).

Table 3. *Raw score per frequency level*

Frequency Level	Raw Score
First	9
Second	7
Third	5
Fourth	6
Fifth	5
Sixth	6
Seventh	5
Eighth	5
Ninth	4
Tenth	5
Eleventh	5
Twelfth	4
Thirteenth	5
Fourteenth	3
Total raw score	74

Note. n=1

The informant obtained the highest raw score at the first frequency level (9 out of 10), followed by moderate scores at the second level (7) and the fourth and sixth levels (6 each). Scores across the remaining frequency levels ranged from 3 to 5, with the lowest score recorded at the fourteenth word family (3). She demonstrated the strongest performance in one of the high-frequency bands (first 1000), variable performance across the second 1000 up to the mid-frequency bands, and progressively weaker performance in the low-frequency word levels. Overall, the results showed a noticeable decline and uneven pattern of performance as frequency levels increased. This pattern is consistent with the informant's reported exposure to English, which is restricted to formal classroom instruction, where she only encounters common, high-frequency input. Moreover, this finding is consistent with the study of Ishikawa et al. (2024), which documented frequency-based declines where learners demonstrated more stable knowledge at high-frequency levels and increasingly fragile knowledge at mid- and low-frequency bands.

Using the vocabulary size estimation formula, the informant's current vocabulary size is 7,400. Based on Nation's (2012) threshold guide in Table 1, this result suggests that the informant is likely capable of comprehending spoken English and children's movies with minimal difficulty, as her vocabulary size met or exceeded the levels required for 98% coverage of these text types. This finding aligns with her self-reported listening skills, where she indicated that she often understands both the teacher and her peers talk in English and experiences less difficulty in the skill. Vocabulary size research has similarly shown that receptive knowledge at this level is often sufficient for basic oral comprehension, even when productive skills remain underdeveloped (Uchihara & Harada, 2018). However, her vocabulary size fell below the thresholds required for newspapers and novels, indicating that she may experience difficulty understanding

more lexically demanding written texts without external support. This inadequacy is particularly relevant given her perceived difficulties in reading and writing and her inability to guess the meaning of unknown words.

This finding is consistent with the informant's reported challenges in English-medium academic tasks and her reliance on a translator device when engaging with written materials and assessments. Despite achieving a vocabulary size that appears sufficient quantitatively, her frequent use of a translator suggests that much of her lexical knowledge may be recognition-based. And while her vocabulary size appeared sufficient for everyday oral communication and simpler texts, it was likely insufficient for sustained comprehension of advanced academic and literary texts commonly encountered in secondary-level education. This may help explain her reported anxiety in speaking and writing, where production of vocabulary and syntax is required.

Ultimately, with her current vocabulary size, she is recommended to undertake deliberate reading and learning of mid-frequency words for a more sustained vocabulary growth and development. This recommendation stands in contrast with the status quo of her language learning experience, which is largely confined to formal classroom instruction. Given her preference for individual work and structured activities, scaffolded exposure to mid- and low-frequency vocabulary through guided reading may be appropriate for supporting her lexical development while reducing her reliance on translation tools. Such an emphasis on mid-frequency vocabulary is consistent with vocabulary research suggesting that gains in this range yield disproportionate benefits for academic reading and overall language proficiency (Laufer & Ravenhorst-Kalovski, 2010).

Distribution of word knowledge across frequency levels

An item analysis per word family level of incorrect answers revealed consistent patterns. These errors did not necessarily reflect a lack in vocabulary knowledge; rather, they suggested a test-taking behavior shaped by prior experiences: a systematic strategy use, particularly the application of context clues or context-based meaning-inferring strategies to a test designed to measure decontextualized form-meaning knowledge.

Reliance on context-based meaning-inferring strategies

The informant's attempt to infer word meaning from contextual clues within the sentences appeared to have caused incorrect responses across frequency levels. Although she claimed that she rarely infers meaning from context clues, she seemed to have attended to surface-level cues within the sentences. In items such as "figure," "nil," "latter," "deficit," "haunt," "devious," "malign," "shudder," "whim," "awe," "ubiquitous," "didactic," and "canonical," she chose distractors that were semantically or pragmatically plausible and were aligned with the perceived logic of the sentences rather than the words' lexical meaning. This pattern is consistent with findings from vocabulary size test research showing that learners may rely on sentence plausibility when form-meaning links are weak, particularly in meaning-recognition formats (Laufer & McLean, 2016).

This pattern suggests that the informant demonstrated overgeneralization and transferred context clue strategies to the VST, despite its decontextualized format. The VST is designed to assess receptive vocabulary knowledge independent of contextual support; hence, such overgeneralization likely contributed to incorrect responses. However, this pattern also presented a stark contrast with the informant's self-reported profile, where she indicated rarely guessing the meaning of unknown words through context clues. This inconsistency may be best explained by her tendency to fall back on using context clues, a reading strategy emphasized in classroom instruction, when she is deprived of external support and explicit lexical translation. As Hu and Nation (2000) argued, when learners have not yet crossed a lexical threshold, strategy use alone is insufficient to ensure accurate comprehension, and attempts to rely on context may result in misinterpretation rather than successful inferencing.

Part of speech distribution errors

Of the total incorrect responses, nouns accounted for the majority (43 items), followed by adjectives (15 items) and verbs (7 items). This distribution indicates that the informant experienced the greatest difficulty with nominal vocabulary, particularly abstract nouns.

Many of the incorrectly identified nouns (e.g., remedy, threshold, stealth, hallmark, bloc, demography) referred to abstract concepts or institutional or specialized terms that are less likely to occur frequently in everyday classroom discourse. In contrast, the relatively small number of verb errors (e.g., maintain, restore, pave, allege, weep, excrete) suggests that the terms may be more accessible due to their frequency in instructional input. Studies on Japanese learners of English have similarly reported that verbs, particularly those with concrete or action-based meanings, are more readily acquired and recognized than abstract nouns (Ishikawa et al., 2024; Itani-Adams, 2007).

Frequency-level trends in lexical errors

At the high-frequency levels (1,000-2,000 word families), incorrect responses were relatively few and often involved abstract or polysemous items (e.g., figure, nil). These errors suggest that while the informant had largely acquired high-frequency vocabulary, depth of knowledge for certain terms remained incomplete. This corroborates with the work of Ishikawa et al. (2024), who claimed that the abstractness of words affects their difficulty regardless of frequency level.

Meanwhile, in the mid-frequency range (3,000-9,000 word families), errors became more frequent and varied. The majority of the errors involved lexicon associated with academic discourse and abstract concepts (e.g., latter, candid, remedy, deficit, thesis, erratic, eclipse, authentic, and hallmark). The informant's tendency to choose contextually reasonable but lexically inaccurate meanings indicates partial familiarity without stable form-meaning skill, consistent with her vocabulary size of 7,400.

Finally, at the low-frequency levels (10,000-14,000 word families), incorrect responses were more consistent. Many of the missed items (e.g., aperitif, refectory, ubiquitous, marsupial, erythrocyte, egalitarian, pallor) belonged to specialized, technical, or culturally specific domains, suggesting expectations of limited exposure rather than strategy misuse. These results align with Nation's (2012) characterization of low-frequency vocabulary as requiring wide reading and domain-specific engagement. Also, research on JLEs similarly reported that as frequency decreases, performance declines predictably, with low-frequency items being affected by factors other than general proficiency, such as limited exposure and domain specificity (Ishikawa et al., 2024).

CONCLUSION

This single-case study investigated the vocabulary size of a Grade 8 Japanese learner of English (JLE) and mapped how her vocabulary knowledge was distributed across frequency levels. Using Nation and Beglar's (2007) Vocabulary Size Test, the informant's receptive vocabulary size was estimated to be 7,400 word families, thus placing her within the mid-frequency range (3,000-9,000).

The findings suggest that the informant had a solid high-frequency vocabulary, which enables her to engage in basic and everyday conversations. However, her performance across the mid-frequency range was assessed to be of high variability, and her lexical knowledge of low-frequency words was inadequate. The error patterns that the informant demonstrated suggest that her vocabulary knowledge was shaped by classroom instruction, which highlighted meaning-inferencing strategies such as using contextual clues. Although the informant reported that she rarely guesses the correct meaning of unknown words when reading, these strategies, while effective for reading comprehension tasks, proved less effective in decontextualized vocabulary assessment. Moreover, while classroom-based instruction had been effective in her early and high-frequency vocabulary development, it was insufficient for ensuring stable acquisition of mid- and low-frequency vocabulary required for academic reading and engagement with more authentic

and advanced English texts. When deprived of external support and explicit lexical translation, the informant appeared to fall back on these classroom-emphasized approaches as a means of coping with lexical uncertainty. This mismatch between instruction and assessment explains why the informant demonstrated uneven performance across frequency levels.

Further analysis of errors revealed systematic rather than random errors. A large number of errors involved nouns, specifically abstract and academic lexicons, while relatively fewer errors occurred in adjectives and verbs. Taking Nation (2012) into account, this gap demands systematic and deliberate exposure to mid- and low-frequency lexical items to support further vocabulary development and to meet increasing academic expectations.

While the current study provided detailed insights into the vocabulary size of one JLE, future research and pedagogical practice affordances may be considered. First, future studies may involve a larger group of ESL or EFL learners to determine whether the patterns observed in this study can be verifiable in similar contexts. Second, subsequent research may explore the relationship between vocabulary teaching and learning strategies and vocabulary assessment formats, particularly how learners transfer the former to decontextualized lexical tests. Investigating this relationship could help inform pedagogy and assessment that accommodates a rather balanced approach between developing context-based inferencing skills and form-meaning knowledge. Third, researchers may examine the long-term effects of deliberate learning of mid- and low-frequency vocabulary instruction. This would allow the evaluation of the effectiveness of targeted interventions. Finally, the findings highlight the importance of learning vocabulary beyond classroom instruction. English language proficiency programs may benefit from incorporating structured opportunities for mid- and low-frequency reading, explicit vocabulary learning strategies, and guided exposure to authentic texts. Such practices may enable learners to develop more stable lexical knowledge and ultimately support their academic and professional endeavors.

REFERENCES

- Coombs, H. (2022). *Case study research: Single or multiple* [White paper]. Southern Utah University. <https://doi.org/10.5281/zenodo.7604301>
- Hamada, A., Hoshino, Y., Kojima, M., Aizawa, K., Iso, T., & Kobayashi, Y. (2024). How many L2 word meanings can learners recall? A latent trait approach to vocabulary size estimation. *Applied Linguistics*, advance online publication. <https://doi.org/10.1093/applin/amae087>
- Hu, M., & Nation, I. S. P. (2000). Unknown vocabulary density and reading comprehension. *Reading in a Foreign Language*, 13(1), 403–430.
- Ibrahim, E. H. E., Sarudin, I., & Muhamad, A. J. (2016). The relationship between vocabulary size and reading comprehension of ESL learners. *English Language Teaching*, 9(2), 116–123. <https://doi.org/10.5539/elt.v9n2p116>
- Ishikawa, Y., Otaki, A., Okamura, H., & Shirahata, T. (2024). Measuring the English vocabulary acquisition of Japanese learners. *Studies in English Language and Education*, 11(1), 59–75. <https://doi.org/10.24815/siele.v11i1.30460>
- Itani-Adams, Y. (2007). Lexical and grammatical development in Japanese–English bilingual first language acquisition. In F. Mansouri (Ed.), *Second language acquisition research: Theory-construction and testing* (pp. 173–201). Cambridge Scholars Publishing.
- Kaskani, A., Zafiri, M., & Dimogeronta, P. (2021). A needs analysis questionnaire: Designing and evaluation. *Journal of English Literature and Language*, 2(1), 1–12.
- Laufer, B., & McLean, S. (2016). Loanwords and Vocabulary Size Test scores: A case of different estimates for different L1 learners. *Language Assessment Quarterly*, 13(3), 202–217. <https://doi.org/10.1080/15434303.2016.1210611>
- Laufer, B., & Ravenhorst-Kalovski, G. C. (2010). Lexical threshold revisited: Lexical text coverage, learners' vocabulary size, and reading comprehension. *Reading in a Foreign Language*, 22(1), 15–30.
- Mirzaeian, V. R. (2020). Developing and validating EFL learners' perception of machine translation questionnaire. *Journal of Foreign Language Research*, 10(3), 642–657. <https://doi.org/10.22059/jflr.2020.307537.741>

- Nation, I. S. P. (n.d.). *Vocabulary tests*. Victoria University of Wellington.
<https://www.wgtn.ac.nz/lals/resources/paul-nations-resources/vocabulary-tests>
- Nation, I. S. P., & Beglar, D. (2007). A vocabulary size test. *The Language Teacher*, 31(7), 9–13. http://www.jalt-publications.org/archive/tlt/2007/07_2007TLT.pdf
- Schmitt, N., Cobb, T., Horst, M., & Schmitt, D. (2017). How much vocabulary is needed to use English? Replication of van Zeeland and Schmitt (2012), Nation (2006) and Cobb (2007). *Language Teaching*, 50(2), 212–226. <https://doi.org/10.1017/S0261444815000075>
- Şen, Y., & Kuleli, M. (2015). The effect of vocabulary size and vocabulary depth on reading in EFL context. *Procedia - Social and Behavioral Sciences*, 199, 555–562. <https://doi.org/10.1016/j.sbspro.2015.07.546>
- Uchihara, T., & Clenton, J. (2020). Investigating the role of vocabulary size in second language speaking ability. *Language Teaching Research*, 24(4), 540–556. <https://doi.org/10.1177/1362168818799371>
- Uchihara, T., & Harada, T. (2018). Roles of vocabulary knowledge for success in English-medium instruction: Self-perceptions and academic outcomes of Japanese undergraduates. *TESOL Quarterly*, 52(3), 564–587. <https://doi.org/10.1002/tesq.453>