When Lexical Inferencing Failed: An Investigation into Strategy Use and Factors Underpinning Less Successful Lexical Inferencing

Nuttapong Rutamornchai[a*], Saowaluck Tepsuriwong[b]

[a] kavawan@gmail.com, School of Liberal Arts, King Mongkut's University of Technology Thonburi, Thailand
[b] saowaluck.tep@kmutt.ac.th, School of Liberal Arts, King Mongkut's University of Technology Thonburi, Thailand
[*] Corresponding author, kavawan@gmail.com

Abstract

EFL learners commonly infer word meanings while reading. However, previous research suggested that a large number of lexical inferencing attempts were far from success (Nylander, 2014; Qian, 2005). This study aims to examine possible factors of failure in lexical inferencing, with strategy use as a main focus. Eight participants were asked to read an authentic academic text and infer meanings of unknown words. A retrospective interview was conducted to investigate the words inferred, meanings obtained, and lexical inferencing strategies used. This study confirmed the high amount of failure or less successful inferencing attempts. Qualitative analysis of the inferred words in context and strategy use in the less successful cases suggested that lexical inferencing is a complex and demanding process. It intertwined a combination of underlying factors including strategy use, characteristics of the inferred words, contextual clues, and such learners'

	factors as vocabulary breadth and depth, grammatical knowledge, and background knowledge. These findings imply a pressing need in enhancing effectiveness of lexical inferencing of EFL learners.

Introduction

While reading, learners commonly encounter unknown words and attempt to guess their meanings. This process of deriving meanings can be called 'lexical inferencing'. According to Haastrup (1991, p.13), it refers to "the process of making informed guesses as to the meaning of a word in the light of all available linguistics cues in combination with the learner's general knowledge of the world, his or her awareness of the co-text, and his or her relevant linguistic knowledge." In this perspective, lexical inferencing seems broader than guessing from context. It involves a variety of knowledge sources available which can be used by learners; context is just one source for lexical inferencing (Schmitt, 2010).

Aside from understanding text content, lexical inferencing leads to incidental vocabulary learning. It helps learners compensate for lexical gaps and facilitate text comprehension, which in turn contributes to vocabulary learning (Read, 2000). With a lot of reading opportunities that allows lexical inferencing, learners will accumulate knowledge of some words previously and partially known and also construct knowledge of some words never exposed to before (Brown et al., 2008; Nation, 2010). Moreover, lexical inferencing is a favorable option among learners when dealing with unknown words. Fraser (1999) revealed that it occurred more frequently than consulting a dictionary and skipping words. If used with other options, lexical inferencing occurred first most of the time.

Despite its possible benefits to reading and vocabulary learning, the outcomes of lexical inferencing seem not satisfactory. Nylander (2014) found that the proportion of correct and partially correct meanings inferred was less than half at around 29%. Qian (2005) reported that the overall success rate was 45%, with each participant's rate ranging from 13% to 100%. Because lexical inferencing is not often reliable, posing some challenges for learners, it would be of interest to investigate causes of failure in this study.

Several studies in lexical inferencing have given attention to strategies to infer words (Bengeleil & Paribakht, 2004; Bunparit & Chinokul, 2018; Hu & Nassaji, 2012; Kaivanpanah & Moghaddam, 2012;

Kangwanpradit, 2016; Nassaji, 2006). Kangwanpradit (2016) discovered 11 strategies to do so, with using sentence meaning as the most popular strategy. Each individual strategy had different frequency of successful use; for example, analyzing word morphology led to 50% of acceptable meanings inferred, while using sentence meaning led to 60%. Bunparit and Chinokul (2018) found that EFL learners similarly used 11 strategy types to infer words in descriptive texts, such as associating inferred words with other similar words and using prior knowledge. Those previous results indicates that strategy use tends to play a crucial role in lexical inferencing. Yet, apart from strategy types, frequency of occurrences, and success rate, few studies have called into question whether there is certain strategy employment underpinning lexical inferencing failure or not, so the present study tries to determine the phenomenon. Also, most previous studies were not conducted in naturalistic settings. Words to be inferred were selected for learners, and some studies used pseudo-words. Contexts were also controlled by locating inferred words in separate sentences. Therefore, this study hopes to shed light on failure in lexical inferencing occurring in naturalistic settings. The participants were asked to read an authentic academic text and choose words to be inferred by themselves.

Two following questions were addressed in this research to investigate causes of lexical inferencing failure.

1) Does certain strategy use lead to less successful lexical inferencing?

2) What other factors are involved in less successful lexical inferencing?

Literature Review

A number of studies have examined how learners cope with unfamiliar words while reading. Paribakht (2005) investigated knowledge sources learners resorted to when making lexical inferences and found that they usually used sentence meaning, discourse meaning, sentence grammar, word morphology, and world knowledge. Hu and Nassaji (2014) explored lexical inferencing strategies and proposed twelve strategy types grouped into four major categories: form-focused, meaning-focused, evaluating, and monitoring strategies (See Table 1). Their classification illustrates lexical inferencing as the integration of

learners' knowledge and their strategic processes. To use form-focused and meaning-focused strategies, learners apply their existing knowledge related to features of inferred words and contextual meaning available. The classification gives attention to not only cognitive but also metacognitive processing, i.e. evaluating and monitoring strategies, which helps regulate cognitive actions. Because of its comprehensiveness, this classification was selected as the framework for identifying lexical inferencing strategies in this study.

Table 1

Classification of Lexical Inferencing Strategies (Hu & Nassaji, 2014)

Strategies	Definitions
1. Form-focused Strategies	
1.1 Analyzing	Analyzing a word using knowledge of prefixes, suffixes, punctuation, or grammar.
1.2 Associating	Attempting to infer the meaning of the target word by associating the word with other similar words.
1.3 Repeating	Repeating the target word or part of the text containing the target word out aloud.
2. Meaning-focused Strategies	
2.1 Using Textual Clues	Guessing the meaning of the target word by using the surrounding context clues.
2.2 Using Prior Knowledge	Using prior knowledge or experience to infer the word meaning.
2.3 Paraphrasing/Translating	Paraphrasing or translating part of the text that contains the target word.
3. Evaluating Strategies	
3.1 Making Inquiry	Questioning their own inferences.
3.2 Confirming/Disconfirming	Confirming or disconfirming the inferences made by using the information in the text.
3.3 Commenting	Making evaluative comments about the target word.
4. Monitoring Strategies	
4.1 Stating the Failure/Difficulty	Making statements about the failure of inferencing or the difficulty of the target word.
4.2 Suspending Judgement	Postponing the inference making and leaving it for a later time.
4.3 Reattempting	Discarding the old inference and attempting to make a new one.

Form-focused Strategies

Form-focused strategies are regularly used by EFL learners (Hu & Nassaji, 2012). Some strategies such as analyzing word structure are beneficial in making inferences. Knowledge of affixes can be used to decompose an inferred word into different parts, and previous knowledge of the parts can be used to finally derive possible meanings of the entire word (de Bot et al., 1997; Sasao & Webb, 2017). For example, the word 'desertification' could be successfully inferred as 'the process of becoming a desert' since the free stem or the derivational suffix or both were understood (Bengeleil & Paribakht, 2004). Laufer (1997) classified 'desertification' and other words which could be decomposed into morphemes and facilitate learning as 'words with morphological transparency.' As Parel (2004) suggested, explicit teaching on frequently found affixes and morphological analysis was required to strengthen the effectiveness of this word-based strategy.

Besides analyzing words, learners can use the strategy of associating, linking words being inferred with other words similar in phonetic or orthographic aspects (Bengeleil & Paribakht, 2004; de Bot et al., 1997; Nassaji, 2003). For example, consider the word 'ineffectual' has the similar meaning to 'ineffective.' However, the use of this strategy can lead to less successful inferences. de Bot et al. (1997) and Kaivanpanah and Rahimi (2017) found that the words 'melt' and 'threatened' were incorrectly inferred since they were semantically associated with the other similar words 'smell' and 'treated.' Besides, while inferring words, learners focus on forms by repeating target words or sections containing them. Nassaji (2003) found that the strategy of repeating was most frequently used, and it helped learners in relating an inferred word to the sentence where the word was located and in using contextual information available.

Meaning-focused Strategies

Meaning-focused strategies, or strategies to infer words based on contextual meaning or information in the text, were the most frequently used strategies, identified by Bunparit and Chinokul (2018) and Hu and Nassaji (2014). Generally, learners use textual clues to elicit probable meanings of inferred words or paraphrase or translate sections of the

text containing the target words, substituting the possible meanings for the inferred words to see whether the meanings are suitable within the contextual meaning or not. Kobayashi (2011) stated that learners depended most frequently on sentence-level context, and it often led to correct meanings inferred.

Besides the context-based strategies, learners also rely on using prior knowledge. Having enough background knowledge aid learners in concentrating better on input, and learners' linguistic knowledge activated by available textual clues contribute to ongoing text comprehensibility, resulting in constructing meanings of some unknown words in the text (Pulido, 2007). Learners infer words effectively if they are located in informative contextual clues, yet the effectiveness will be reinforced by learners' prior knowledge. (Kaivanpanah & Rahimi, 2017).

Evaluating Strategies

Evaluating strategies are defined as strategies to evaluate target words or to examine or verify the appropriateness of meaning inferred (Hu & Nassaji, 2012). Evaluating strategies consist of making inquiry into their own inferences, confirming or disconfirming inferences made using the information in the text, and commenting on inferred words. These strategies are associated with metacognition, which is "the ability to reflect on what is known, and results in critical but healthy reflection and evaluation of thinking that may result in making specific changes in how learning is managed" (Anderson, 2008, p.99), indicating that effective strategy use should involve metacognitive strategies (Macaro, 2006). Nassaji (2003) argued that confirming/disconfirming and making inquiry were correlated more with successful lexical inferencing than other strategies. His study suggested the importance of evaluating strategies towards lexical inferencing.

Monitoring Strategies

Monitoring strategies are strategies to indicate learners' awareness of lexical inferencing process and text-related characteristics (Hu & Nassaji, 2012). Like evaluating strategies, monitoring strategies are associated with metacognition. In this study, monitoring strategies include stating the failure or difficulty of inferred words, suspending

judgement, and reattempting the new inference. The use of these strategies can be viewed as a sign of effective strategy employment. Hu and Nassaji (2014) observed that the skilled learners did not quickly decide on possible meanings of unknown words as soon as the words were encountered. By contrast, they made conclusion about word meanings when evidence was adequate to support their decisions.

The aforementioned strategies in the four groups appear to contribute positively and distinctively to lexical inferencing process and outcomes. However, the question still lies in whether there are any individual strategies or certain strategy use accounting for failure. Strategy use can affect lexical inferencing, but whether it is solely responsible for failure or there are other factors involved is also demanding further discussions. Thus, the current study examines causes of less successful inferences, including strategy use as a main focus and also possible factors.

Moreover, in an attempt to infer a word meaning, learners often use a combination of strategies rather than a single strategy. Therefore, this study aims not only to investigate each strategy occurrence separately but also to explore a combination or a cluster of strategy use and its association with lexical inferencing failure.

Clusters of Lexical Inferencing Strategies

Apart from considering strategies individually, it was observed that while inferring a word, strategies were often used in clusters (Paribakht & Wesche, 1999). According to Oxford (2017), strategy clusters is defined as several strategies used in sequence or simultaneously to achieve language learning. There was general consensus among strategy researchers that using strategies in combination can help learners perform language-related tasks more effectively (Cohen, 2011). Hu and Nassaji (2014) discovered that learners who were successful in lexical inferencing could integrate several strategies flexibly at different times, depending on inferred words and context clues. As mentioned by Macaro (2006, p.327), "effective learners deploy strategies in clusters appropriate to contexts and tasks." Hamada (2014) found that unsuccessful learners relied more on word-based clues, and reliance on not only word-based information but also contextual information could improve lexical inferencing.

Much as some studies showed that clusters of strategies and appropriate combination of them were necessary for successful lexical inferencing, some studies did not agree with that. Kangwanpradit (2016) discovered that most attempts required only single strategies. Bengeleil and Paribakht (2004) surprisingly found that the lower proficiency group made more frequent use of strategy clusters than the higher group. They speculated that lower proficiency learners were less able to derive meanings by using fewer strategies and then made greater attempts to work on it. There is still some controversy surrounding this issue. However, little research has investigated the area. This study, therefore, included it as part of strategy use.

Methodology

Participants

This study was a part of the larger scale research that investigated lexical inferencing strategies in naturalistic settings of an academic context of graduate studies. The participants were eight second-year master's degree students in an international program of applied linguistics at a university in Thailand, being recruited on voluntary basis. They were clearly informed about the research aims and procedures and signed a consent form explaining their rights and other ethical issues in conducting research. Through administering the vocabulary size test, their vocabulary knowledge was above the threshold of 5,000 word families (Nation & Beglar, 2007). As Laufer and Ravenhorst-Kalovski (2010) propounded, learners knowing at least 4,000-5,000 word families could know around 95% of words in a reading text, regarded as sufficient to comprehend it. The participants were asked to read a selected text relevant to their academic discipline, and one of the researchers interviewed them about their lexical inferencing after reading the text.

Instruments

Two main research instruments were used in this research. The first one was an academic text. The text containing 1,814 words was excerpted from one chapter in "An Introduction to Applied Linguistics: From Practice to Theory", compiled by Alan Davies (2007). It was selected

because, firstly, the content was related to the participants' field of study. Secondly, the text difficulty could be challenging enough for them as it was meant for graduate students. Analyzed by the Lancaster Vocab Analysis Tool (Brezina & Gablasova, 2015), 88.48% of the words in the text were high-frequency words. The rest were academic words and words that may challenge the participants to work out the meanings. Moreover, the text was new to them; they had not read it before. The text was consequently used to identify inferred words, study the contexts of the words, and evaluate the success of the participants' lexical inferencing.

The second instrument was a retrospective interview. It aimed at exploring strategies and factors underpinning lexical inferences. This kind of interview was chosen in that it could allow participants to verbalize thoughts conveniently and clearly after reading, and it is not as demanding as a think-aloud protocol which may better tap into thought processes at hand but might interrupt the reading and lexical inferencing process (Rose, 2015).

Data Collection

In the data collection stage, each participant was asked to read the text at their own pace and mark word they inferred while reading. Immediately after finishing reading, each of them participated in the retrospective interview. Supported by the reading text with the marked words, each participant was interviewed about what these words probably meant and how they inferred these words. Each interview lasted approximately 30 minutes, and it was audio recorded and transcribed verbatim later.

Data Analysis

To answer both research questions, the words and meanings inferred were identified and classified into successful and less successful cases. The researchers decided on the most suitable meanings of words based on the context and consultation with several dictionaries. The criteria used in the assessment scale are illustrated in Table 2 below.

Table 2

The Assessment Scale to Evaluate Lexical Inferencing

Descriptors	Scores	Criteria
Successful Inferencing	3	The meaning was appropriate for the text context with little or no loss of meaning.
	2	The meaning was generally appropriate for the text context; it was partially correct with some loss of meaning.
Less Successful Inferencing	1	The meaning was generally appropriate for the text context, but it was not similar to or was far from the actual meaning of the word when judged out of context.
	0	The meaning was incorrect and inappropriate for the text context, or there was no meaning deduced by a participant.

The scale was adapted from the earlier studies (Fraser, 1999; Haastrup, 2008; Hu & Nassaji, 2012; Kobayashi, 2011; Nylander, 2014). It was used to measure the degree of success of lexical inferencing. For instance, the word 'furious' in the context "John was furious when he read the note. He thought that his boss treated him unfairly." will be successfully inferred (3 scores) if the meaning obtained is 'angry', and a lexical inference as 'not satisfied' will gain 2 scores as it is partially correct. In contrast, 'confused' and 'satisfied' will be judged as less successful with the score of one and zero. After analyzing the degree of success of lexical inferencing cases, 20% of them were crosschecked to construct interrater reliability by three professors in applied linguistics. The result was a 90.74% coefficient agreement, which indicated strong reliability.

Afterwards, strategy occurrences in each attempt were identified and categorized based on Hu and Nassaji's (2014) framework. Reliability of strategy identification was also established by having 20% of attempts crosschecked by the same three experts. The agreement percentage was 86.11%, constituting strong interrater reliability. Next, strategies used were mapped with the degree of success in lexical inferencing to investigate whether any certain strategies contribute to successful or less successful attempts. Salient cases of less successful inferences were further selected. That is, the cases of two most frequently inferred words with less successful attempts were selected to analyze in-depth, and they were compared with the other two cases with both success and failure,

in order to provide insights into strategies used and related factors which led to less successful inferencing.

Results

Lexical Inferencing Attempts and Levels of Success

This section is directed to investigate lexical inferencing attempts and the levels of success. Initially, there were 178 attempts on different 61 words as some words were inferred by two participants or more. The success degree of all attempts was evaluated based on the meanings inferred, as shown in the table below.

Table 3

Degree of Success of Lexical Inferencing Attempts

Lexical Inferencing Attempts	Frequency	Percentage
Successful	46	25.8%
Less Successful	132	74.2%
Total	178	100%

Table 3 reveals that less successful outcomes were more noticeable, with 74.2% or 132 of all 178 attempts being less successful. The finding suggests that lexical inferencing seemed to be very challenging even for the graduate-level participants with vocabulary knowledge above the threshold of 5,000 word families.

Further examination was carried out to map the degree of success or the outcomes of lexical inferencing with strategies used for deriving the meanings. In order to make these 178 attempts, the total of 550 strategy occurrences were noticed, which were classified into 11 types of lexical inferencing strategies. In some attempts, learners employed one strategy, while others involved two strategies or more. The level of success of each strategy occurrence is presented in Table 4 below.

Table 4

Degree of Success of Lexical Inferencing Strategies

Strategy Types		The Degree of Lexical Inferencing Success					
		Successful		Less Successful		Total	
		f	%	f	%	f	%
1. Form-focused Strategies	1.1 Analyzing	25	34.7	47	65.3	72	100
	1.2 Associating	15	37.5	25	62.5	40	100
	1.3 Repeating	6	15.0	34	85.0	40	100
	Subtotal	46	30.3	106	69.7	152	100
2. Meaning-focused Strategies	2.1 Using Textual Clues	30	25.6	87	74.4	117	100
	2.2 Using Prior Knowledge	10	40.0	15	60.0	25	100
	2.3 Paraphrasing	17	23.9	54	76.1	71	100
	Subtotal	57	26.8	156	73.2	213	100
3. Evaluating Strategies	3.1 Making Inquiry	4	16.7	20	83.3	24	100
	3.2 Confirming/ Disconfirming	12	24.0	38	76.0	50	100
	3.3 Commenting	15	31.3	33	68.7	48	100
	Subtotal	31	25.4	91	74.6	122	100
4. Monitoring Strategies	4.1 Stating the Failure/Difficulty	10	16.1	52	83.9	62	100
	4.2 Reattempting	1	100	0	0	1	100
	Subtotal	11	17.5	52	82.5	63	100
Total Occurrences		145	26.4	405	73.6	550	100

Table 4 shows that 73.6% of strategy occurrences led to less successful attempts. All strategy types in the four categories had the higher proportion of less successful use, and none of the strategy types reached the success rate of 50%, except the strategy of reattempting which was employed only once. More precisely, there was no strategy that could be related to successful attempts. On the other hand, very high percentage of strategies used did not guide the participants to appropriate meanings. The findings suggest that strategies could not ensure success or prevent failure in lexical inferencing.

As strategies used did not seem to be the key to success and many attempts failed, each attempt of lexical inferencing was further investigated to explore how the participants worked on each word;

whether they varied the strategies used. Table 5 presents the number of strategies used in each attempt and the degree of success.

Table 5

Degree of Success of Lexical Inferencing Attempts in Relation with the Amount of Strategy Use

| Amount of Strategy Use in One Attempt | The Degree of Lexical Inferencing Success | | | | | |
| | Successful | | Less Successful | | Total | |
	f	%	f	%	f	%
Single Strategy	4	15.4	22	84.6	26	100
Strategy Cluster	42	27.6	110	72.4	152	100
- Two Strategies	14	32.6	29	67.4	43	100
- Three Strategies	12	25.0	36	75.0	48	100
- Four Strategies	8	26.7	22	73.3	30	100
- Five Strategies	3	17.6	14	82.4	17	100
- Six Strategies	5	50.0	5	50.0	10	100
- Seven Strategies	0	0	3	100	3	100
- Eight Strategies	0	0	1	100	1	100
Total of Attempts	46	25.8	132	74.2	178	100

Table 5 shows that most of the attempts (152 attempts) were in clusters, requiring two to eight strategies, and only a few attempts (26 attempts) were completed by a single strategy. Considering the amount of strategy use in each attempt, it seemed that the number of strategies used could not guarantee success, and simple rules of thumbs of 'the more the merrier' could not be applied here. The number of strategies contributed to neither successful nor less successful inferences.

The findings in this section offered a glimpse of lexical inferencing strategy employment, which suggested that it is a demanding skill and types as well as numbers of strategies used did not seem to be the key to success or failure of inferencing results. Subsequently, the failure cases would be further investigated qualitatively to provide more insights into the cases and to illustrate the influential factors.

Less Successful Lexical Inferencing Cases

This section digs deeper into less successful inferencing cases. Four salient cases (evocative, endowment, elucidate, and mim-mem)

were closely investigated as the words were inferred by seven or eight participants, and failures or mixed results of lexical inferencing were observed.

'Evocative'

All eight participants failed to infer the word 'evocative', which means 'making you think of a strong image or feeling, in a pleasant way'. The word was in the context of ". . . Alice Kaplan's 1993 **evocative** account of her own love story with learning and teaching French reminds us that not all language learning is doomed. . . ."

Table 6

Strategies to Infer the Word 'Evocative'

Types of Lexical Inferencing Strategies		Strategy Use by Participants							
		A	B	C	D	E	F	G	H
1. Form-focused Strategies	1.1 Analyzing	x	x	x					x
	1.2 Associating	x					x		x
	1.3 Repeating					x	x		
2. Meaning-focused Strategies	2.1 Using Textual Clues		x	x	x		x		
	2.2 Using Prior Knowledge								
	2.3 Paraphrasing/Translating	x				x			x
3. Evaluating Strategies	3.1 Making Inquiry								
	3.2 Confirming/Disconfirming	x							
	3.3 Commenting							x	
4. Monitoring Strategies	4.1 Stating the Failure/Difficulty					x	x	x	x
	4.2 Reattempting								

Table 6 shows that, except Participant D who used textual clues just once, the others used combination of strategies, at least two strategies. Most of them similarly integrated form-focused and meaning-focused strategies. However, all of them failed to achieve a correct meaning.

Participant F made use of word-form and context information by combining form-focused and meaning-focused strategies. However, it did not suffice to infer 'evocative' correctly. Noticeably, he tried to associate the word to some similar-looking words, but it did not work well. Another

problem seemed to be his incomplete understanding of context as illustrated in the extract below:

> ". . . **Evocative** account of her own love story with learning and teaching French reminds us that not all language learning is doomed . . . . . Evocative account of her own love story, not all language learning is doomed. [strategy 1.3] I read the part before and after the word since it is in the same sentence, but I don't understand 'account of her own love story'. [strategy 4.1] I think it could mean 'advocate'. Wait, maybe not, the word is 'evocate'. [strategy 1.2] I can't guess it actually. [strategy 4.1] Maybe it means '**recorded**'. I guess from the context. Recording, recording her story of love. I guess from the context of the sentence. [strategy 2.1] . . ." (Participant F)

Participant H's transcription shed light on another reason for less successful inferencing. He stated that because the context did not provide sufficient clues, the word 'elucidate' was unlikely to be inferred, and only its part of speech could be elicited. Also, he mistranslated the phrase 'account of'. According to him:

> ". . . Initially, I think '**evocative**' is an adjective because it has '-tive' and modifies the word 'account'. [strategy 1.1] Evocative account, evocative account of her, it is 'about her', right? [strategy 2.3] The word is difficult to guess. I can't guess it right. [strategy 4.1] Evoc-, evolve, it could not be from 'evolve'. I don't know. [strategy 1.2] I think the word can't be guessed because it doesn't have enough clues from the context and from the words around. We can guess only its part of speech, but it is difficult to guess its meaning. [strategy 4.1] . . ." (Participant H)

Less successful inferences in the case of 'evocative' seemed to reflect problems in the participants' background knowledge and understanding of context as well as the clarity of the context itself. When problems occurred, the participants seemed to be well aware of the obstacles or limitation during the task. They realized that the meanings inferred might not be accurate. However, numbers and types of strategies used did not seem to be the key factors of the failure.

'Endowment'

Seven inferencing attempts were on 'endowment' as Participant B did not work on this word. It is defined as 'a quality or an ability that you are born with'. The following excerpt presents the word within the context: ". . . The study of the uses that man makes of the language **endowment** and of the problems that he encounters in doing so is the subject matter of applied linguistics. . . ."

Table 7

Strategies to Infer the Word 'Endowment'

Types of Lexical Inferencing Strategies		Strategy Use by Participants						
		A	C	D	E	F	G	H
1. Form-focused Strategies	1.1 Analyzing		x			x		x
	1.2 Associating							
	1.3 Repeating		x		x			
2. Meaning-focused Strategies	2.1 Using Textual Clues	x	x	x	x	x	x	x
	2.2 Using Prior Knowledge							
	2.3 Paraphrasing/Translating	x	x		x			
3. Evaluating Strategies	3.1 Making Inquiry				x			
	3.2 Confirming/Disconfirming							
	3.3 Commenting		x		x		x	
4. Monitoring Strategies	4.1 Stating the Failure/Difficulty	x	x		x	x	x	x
	4.2 Reattempting							

Table 7 shows that all attempts consisting of one to six strategies were evaluated as less successful. The strategy of using textual clues was used in all attempts, and stating the failure/difficulty occurred in almost all attempts, implying that the participants struggled to infer this word.

Most of them wrongly associated the inferred word with the word 'problem' in this context because they misunderstood that the conjunction 'and' joined the words 'endowment' and 'problems' together. Incomplete understanding of sentence structure could be seen in Participant E's excerpted transcription below.

> ". . . When I guessed this word, I didn't understand, so I skipped to look at this part. <The participant underlined the latter part of the sentence after the inferred word.> The study of the uses that man makes of the language

endowment and of the problems. It might be guessed from 'problem'. 'Problem' could be close in meaning to this word. [strategy 2.1] So, it might be '**difficulty**', right? Language **difficulty** and problems he encounters is the subject matter of applied linguistics. [strategy 2.3] . . ." (Participant E)

Another factor affecting lexical inferencing was noticed from Participant F's attempt. According to him:

". . . The study of the uses that man makes of the language **endowment** and of the problems that he encounters in doing so. Actually, when I guess this word, I have to read other words around, like context clues. The study of the uses that man makes of the language endowment and of the problems that he encounters. I think it means '**language encounter**'. [strategy 2.1] It is an actual guess, actually, without any background, without other similar words. I haven't been quite used to looking at word roots, or something like that. [strategy 4.1] I have never heard of 'endow', so it isn't useful for making me understand better. [strategy 1.1] . . ." (Participant F)

Participant F tried to use the root word 'endow' but he did not know the meaning, so he could not successfully inferred the meaning. Lack of knowledge of the root word 'endow' was his main problem. He also tried to use contextual clue. However, the local context that he focused on did not seem to work. It suggests that vocabulary knowledge specific to that inferred word indicated lexical inferencing success.

The word 'endowment' seemed to be challenging for this group of participants. The word itself is not a high frequency word, so the participants might not know the word. Problems arising from this case may come from their background knowledge and the word-related characteristics as the context is difficult to elicit a probable meaning and they did not have knowledge about the root word.

'Elucidate'

The word 'elucidate' was inferred by all participants. However, only one attempt by Participant A was successful. This word means 'to make something clearer by explaining it more fully' and is located in the

following excerpt: ". . . the use of linguistics theories, methods and findings in **elucidating** and solving problems to do with language which have arisen in other areas of experience. The domain of applied linguistics is extremely wide and includes foreign language learning and teaching . . ."

Table 8

Strategies to Infer the Word 'Elucidate'

Types of Lexical Inferencing Strategies		Strategy Use by Participants							
		A	B	C	D	E	F	G	H
1. Form-focused Strategies	1.1 Analyzing	√							
	1.2 Associating								
	1.3 Repeating								
2. Meaning-focused Strategies	2.1 Using Textual Clues	√	x	x		x	x	x	x
	2.2 Using Prior Knowledge	√							
	2.3 Paraphrasing/Translating		x	x	x		x		
3. Evaluating Strategies	3.1 Making Inquiry	√	x						
	3.2 Confirming/Disconfirming	√		x	x				
	3.3 Commenting			x		x	x	x	
4. Monitoring Strategies	4.1 Stating the Failure/Difficulty				x			x	
	4.2 Reattempting								

Table 8 reveals that the participants employed similar types of strategies but most of them failed to achieve the appropriate meaning of this word. All of them used 'textual clues' to infer meaning. Participant H relied on this strategy solely and failed, whereas the others used it with other strategies and mostly failed. Only Participant A used combinations or clusters of strategies and was successful.

Noticeably, all of them relied mainly on meaning-focused and evaluating strategies. However, these strategies did not guarantee success or lead to failure. The only two strategies used by Participant A but not employed by the other less successful participants were analyzing and using prior knowledge. These two strategies might play a significant role in achieving a probable meaning. Also, she was the only person who integrated both form-focused and meaning-focused strategies, exploiting both word-based and context-based information. The way she dealt with unknown words is presented in the following transcription.

". . . This word, **elucidating**. Elucidating and solving, I used the same guessing method as other words, using 'and'. Solving is finding how to deal with problems. Elucidating might be like to make an idea pop into one's head, like to figure things out, something like that. [strategy 2.1] Also, I feel quite familiar with the word 'elucid'. It might mean 'bright, being full of light'. [strategy 1.1] In my sense, I feel that it could mean 'full of light'. I have ever seen the word somewhere but can't remember when. The meaning comes as my first impression as soon as I saw the word in text. [strategy 2.2] Actually, I don't know if the meaning is correct or not. But from my sense, it relates to 'bright light'. [strategy 3.1] That's how I guess this word. So, 'elucidating' means something like **I imagine having a bright light on one's head when understanding things clearly**. I guess by using my imagination somehow and mainly use the word 'and'. The meanings of two words should be in the same way, either positive or negative for both. [strategy 3.2]" (Participant A)

The extract above shows that Participant A had profound knowledge of the word base, and she employed a cluster of strategies well. In case of the word 'elucidate', the less successful participants did not elicit meanings from word forms. They were probably unfamiliar with the root word 'lucid'. Besides, they used the same context as Participant A; however, most of their inferred meanings were sensible but inaccurate. It could be noticed that although the context assisted in achieving the correct meaning, it still allowed a number of choices which sounded right in the context but was not a real definition of this word. For instance, Participant C concluded 'elucidate' meant 'identify', while Participant F derived the meaning 'analyze'.

". . . Ah, I don't know the word. I haven't seen the word before, and I don't know. [strategy 3.3] But I guessed from the problem, solving the problem. [strategy 2.1] Methods and findings in elucidating and solving the problems, so for solving problems we need to identify the problem, right? [strategy 2.3] I think this one is the same meaning as identify. Identify. Identify or how can I say? Identify or maybe describe. It would be better **identify**. Identify the problems and solving the problems. [strategy 3.2] . . ." (Participant C)

". . . OK, the use of linguistics theories, methods and findings in **elucidating** and solving problems. I think here means analyzing and finding ways to manage problems. [strategy 2.3] With the word 'and', the meanings should go together. I guess from this conjunction. [strategy 2.1] If I delete this word, finding in solving problems, I still understand the sentence meaning. Actually, I don't have to understand this word, but my guess probably goes to **analyzing**. [strategy 3.3] . . ." (Participant F)

Participant H's attempt suggested another problem in lexical inferencing. His attempt was less successful as he misused the context clue. The participant deduced a meaning with misunderstanding that two words linked by the conjunction 'and' were synonymous, as seen below.

". . . The next word is **elucidating**. Finding in elucidating. I guessed from the word 'and' in the middle. The left word and the right word are connected with 'and'. Both words could be synonyms. So, I think 'elucidating' might mean **solving**. [strategy 2.1] . . ." (Participant H)

These extracts from this less successful case suggested that strategies themselves should not be blamed for inferring incorrect meanings, seeing that both successful and unsuccessful participants employed the same strategy of using textual clues. The factors that play roles in this case seemed to be knowledge of the stem, the quality of context to aid lexical inferencing, and misuse of context.

'Mim-mem'

'Mim-mem' was inferred by seven out of eight participants; four of them was successful. It is abbreviated from 'mimicry-memorization', another term for 'audiolingual teaching method'. The word was in the excerpted text: ". . . And that is also true in formal instruction where the teacher becomes dispirited because the methods in use are not working. Again the solution is to change the method. And for a time the new methods such as direct, **mim-mem**, communicative, cognitive, technological (Stern 1983) work but . . ."

Table 9

Strategies to Infer the Word 'Mim-mem'

Types of Lexical Inferencing Strategies		Strategy Use by Participants						
		A	B	C	D	F	G	H
1. Form-focused Strategies	1.1 Analyzing							
	1.2 Associating	√	√	√	√		x	x
	1.3 Repeating							
2. Meaning-focused Strategies	2.1 Using Textual Clues		√	√	√	x		x
	2.2 Using Prior Knowledge	√		√		x		
	2.3 Paraphrasing/Translating	√	√					
3. Evaluating Strategies	3.1 Making Inquiry					x		x
	3.2 Confirming/Disconfirming	√		√				
	3.3 Commenting		√	√				
4. Monitoring Strategies	4.1 Stating the Failure/Difficulty				√	x	x	x
	4.2 Reattempting							

As shown in Table 9, several participants succeeded in inferring this word. These successful attempts were carried out through strategy clusters, and so did less successful attempts. Some strategies such as associating and using textual clues resulted in both success and failure.

Considering successful inferences, combinations of form-focused and meaning-focused strategies were noticed, especially the strategy of associating and other strategies. Participant B, for example, associated the word 'mim-mem' with 'mimic', while Participant C linked it with 'mimic', and Participant D related it to 'memory'. Besides using associating, Participant B used textual clues as well as paraphrasing/translating to infer 'mim-mem' as one teaching method as shown in the extract below:

> ". . . For '**mim-mem**', I don't know what it is. Is it an abbreviation? But I just want to guess. I don't know how, though, but I try. [strategy 3.3] As I said before, everything in the list will be in the same way because of 'such as' as a keyword. 'Such as' is followed by examples of something. I have to look at the previous page to see what the examples are about. [strategy 2.1] Examples of the new methods, new ways of doing something, such as direct, asking directly, mim-mem, memorize, something like that, communicative, communicating with each other, cognitive, relating to mental process, or technological. It talks about

> different ways of teaching. [strategy 2.3] So, 'mim-mem'
> should be **a method or process by using** . . . . . Ah, mimic,
> **mimicking**, right? Or **copying**. That's my guess. [strategy 1.2]
> . . ." (Participant B)

These strategies, however, did not always yield success in lexical inferencing. Participant H, for example, also employed a combination of form-focused (associating) and meaning-focused strategies (using textual clues). However, his attempt was not successful. In the interview, he stated that he lacked background knowledge to tackle with this word and clarified that he was not confident about his inference.

> ". . . For this word, methods such as direct, **mim-mem**.
> 'Mim' is shortened from minimum. 'Mem' is from
> 'memory', from my guess. [strategy 1.2] Mim-mem, direct,
> communicative, cognitive, technological. Ah, words on the
> left of 'mim-mem', words on the right, or the next words
> are not similar, like A, B, and C. [strategy 2.1] So, the word is
> hard to guess because I don't know what my guess should
> be and I have no background knowledge. [strategy 4.1] If I
> guess, it would be **using the memory at a minimum**. If I
> translate it, anyway I'm not sure. It would be **a technique
> that requires a minimum of memorization**. Actually, I don't
> know if it is correct. [strategy 3.1] . . ." (Participant H)

Another two less successful attempts were made by Participant F and Participant G. Both participants used combinations of strategies. In the following transcription, Participant G associated 'mim-mem' with 'minimum memory' but did not check the inferred meaning with the context, resulting in the less successful inferencing.

> ". . . This one, as direct, **mim-mem**. What is mim-mem? I
> feel it might be a shorten form, but I can't guess what it is.
> [strategy 4.1] **Minimum memory**, right? I'm not sure, but
> that's what I thought at that time. [strategy 1.2] . . ."
> (Participant G)

In case of Participant G, she associated 'mim-mem' with the known words and stated uncertainty about the results without any further attempt at other strategies. When the first strategy did not lead to a proper meaning and she did not have recourse to more strategies, failure could occur.

For the 'mim-mem' case, it seems that the participants' background knowledge and not enough resilience or persistence for further attempts to monitor the strategies when the first attempt fails might be the factors indicating failure in lexical inferencing.

In Section 4.2, the in-depth analysis of the four cases with varying levels of failure posited lexical inferencing as a complex process. A less successful attempt could be underpinned by one or some of the underlying factors being intertwined, including strategy employment, characteristics of inferred words, quality of contextual clues, and learner factors such as vocabulary knowledge related to particular contexts or words inferred, grammatical knowledge, and background knowledge. These factors will be discussed in the following section.

Discussion

Overall, nearly three fourths of lexical inferencing attempts in this study were less successful, although made by the high-proficiency participants. This is consistent with previous research that inferring words resulted in more incorrect meanings than correct ones (Nylander, 2014; Qian, 2005). Investigating failures occurring in less successful inferencing revealed interesting issues related to strategy use and other factors underpinning the less successful outcomes.

Strategy Use Underpinning Less Successful Lexical Inferencing

Regarding individual strategies, the findings suggest that use of any strategy types could not ensure success in lexical inferencing, and it could not be solely responsible for failure as well. The same strategy could be noticed in both successful and less successful cases. As proposed by Ehrman et al. (2003), any strategy should be seen as neutral, neither good nor bad, until it is employed in particular contexts. A strategy is beneficial if it relates well to task demand, suits learners' learning style preferences, and is effectively used along with other relevant strategies. Similar findings were noticed in Nylander's (2014) study; types of strategies used could not be used to differentiate successful and less successful inferencers. In fact, the two participant groups were marked by vocabulary depth.

In the findings, some types of lexical inferencing strategies such as stating the failure/difficulty seemed to appear in less successful cases. It indicates that the participants realized some hurdles that could hinder them from achieving correct word meanings, and they were aware that meaning outcomes were possibly inaccurate. Therefore, this strategy could not be simply interpreted as the culprit of failure. Hu and Nassaji (2014) reported that monitoring and checking lexical inferences was one characteristic of successful learners. In this study, however, this strategic behavior was associated more with failure. The strategy of stating the failure/difficulty indicates learners' awareness and struggle in lexical inferencing instead.

It is also interesting that using textual clues, one of the most popular strategies, still had a higher percentage of less successful use. Nevertheless, it could not be concluded that it is an ineffective strategy. Inferences could result from other associated factors such as availability of context clues, learners' ability to use context clues, and their vocabulary knowledge to exploit context clues (Nguyen, 2020; Pulido, 2007; Webb, 2008).

Considering the amount of strategy use, most lexical inferencing attempts occurred in clusters rather than single strategies. There is general agreement that a strategy should be used together with other strategies to increase effectiveness of learning, and a strategy used in isolation cannot function well (Cohen, 2007; Cohen, 2011). Nevertheless, this study indicates that the number of strategies was not directly associated with lexical inferencing outcomes. Use of strategy clusters were not necessarily a precursor to success or could not deter failure. Instead, it implies the participants' attempts and their resilience. They strived to infer words without giving up and the tasks were also demanding. As proposed by Macaro (2010), when a learner has a relatively difficult task with their insufficient linguistic knowledge, more strategies will be consulted. Yamamori et al. (2003) speculated that "the more, the better is not always the case in strategy use," and the small number of strategies employed does not equate to ineffective learning. Using several strategies but not using effectively could lead to unfavorable learning gains.

The employment of strategy clusters in lexical inferencing can also be seen as the participants' effort to maximize all facilitating sources. If the word or context-based clues were available and usable, the

combination of form-focused and meaning-focused strategies appeared to bring about achievement rather than using either of them. This supports Hamada's (2014) findings. She found that advanced proficiency learners not only made lexical inferences through word parts but also evaluated whether meanings inferred were suitable with contexts.

Other Factors Underpinning Less Successful Lexical Inferencing

As previously discussed, the challenging nature of lexical inferencing implies that strategy types or the amount of strategy use alone are not adequate for success in lexical inferencing. There are other influential factors that lead to less successful inferencing. One possible factor was learners' insufficient knowledge of vocabulary. Unsurprisingly, previous studies revealed that learners who had lower vocabulary knowledge made lexical inferences less successfully than those with higher levels (Kobayashi, 2011; Nassaji, 2006; Nylander, 2014; Qian, 2005). In this study, due to lack of vocabulary knowledge in certain contexts, the participants sometimes mistranslated parts of sentences where target words were located, or understood the context meaning partially, resulting in wrong meanings inferred. This confirms Pulido's (2007) results. She pointed out that the more learners' vocabulary knowledge associated with the text being read, the more successful inferences they could make. Such sufficient word knowledge allowed them to use available contextual clues from which they inferred unknown words. Furthermore, although Parel (2004) suggested teaching frequent derivational affixes to strengthen the ability of analyzing word structure, this study showed that lexical inferencing probably depended more on free roots or stems inside the inferred words. Despite the word's morphological transparency, the participants could not gain acceptable meanings because they did not know the free roots or stems therein.

Another factor was learners' insufficient grammatical skills. Knowledge of grammar often assisted them in lexical inferencing (de Bot et al., 1997; Paribakht, 2005). In some attempts, the participants could not infer words successfully since they mistook the parallel parts or parsed sentence components incorrectly. Some of them had misconception of connecting words, for example, stating that the inferred word and another word joined with 'and' must be synonyms. Misunderstanding syntactic relationships among ideas in the sentence

led to mistranslating contextual information and inferring words unsuccessfully.

Lack of background knowledge also helps explain less successful inferences. The quantitative results showed that using prior knowledge had the higher success percentage than other strategies. From the interview results, a participant with the paucity of background knowledge on a certain context could not take advantage of the context clues available and ended in incorrect inferences. As reported by Kaivanpanah and Rahimi (2017), learners inferred unknown words better when reading texts with familiar topics than ones with unfamiliar topics.

Inexplicit contextual clues appear to take part in less successful inferences as well. Webb (2008) proved that the degree of informative context significantly affected gains of word meanings. In this study, some contexts did not provide adequate information for the participants to be able to infer words successfully. This is consistent with Nguyen (2020)'s findings that reading passages in high-school textbooks seldom provided informative clues to infer unknown words correctly. Another case of inexplicit clues was illustrated in attempts on 'elucidate'. Less successful inferences were partly not due to the participants themselves but due to the fact that some contexts allowed a number of meanings to be inferred. Some of them sounded plausible in the context but were not the actual definition of the word. Another text-related factor might be characteristics of the inferred words themselves. Some inferred words, along with the root words inside, are not high-frequency words, so the participants were unfamiliar with them and unable to use the root words inside to infer a possible meaning of the entire words.

Conclusion and Pedagogical Implications

This study has investigated strategy use and other factors underpinning failure in lexical inferencing while reading an academic text. The results intimate that any individual strategies could not be directly blamed for less successful inferences, and the amount of strategy use was unlikely to guarantee success or prevent failure in lexical inferencing. In fact, addition of strategies to infer words reflected learners' efforts and difficulties in deriving proper meanings of inferred words. Besides strategy use, there seems several underlying factors influencing less successful inferences. These factors included insufficient knowledge of

vocabulary specific to the text context or the inferred words, insufficient grammatical skills, and lack of background knowledge, inexplicitness of contextual clues, and the words' characteristics themselves.

For pedagogical implications, as lexical inferencing is a challenging process that occurs commonly while reading, learners should be trained to enhance the skills to gain the most benefits of learning words incidentally in context, not only knowledge of meaning but also other dimensions. Some might argue that in EFL commercial materials, lessons on guessing word meanings offer only explicit types of context clues (e.g. definition clues, example clues, and comparison/contrast clues), which are not often found in authentic reading texts. Yet, it is still worthwhile to teach learners these explicit clues in order to enhance their chances of successfully inferring words located in these clue types in authentic texts.

What's more, teachers should raise awareness of inferring words in authentic texts in which learners might encounter more inexplicit clues than explicit ones. Whether the word is likely to be guessed and from what clues the word is guessed, for example, are some questions that can be raised for class discussion. This will lead learners to infer unfamiliar words more logically and be more aware of possibilities and limitations in lexical inferencing. If it seems improbable to do so or learners are unsure of meanings inferred, integration with other vocabulary learning methods, such as consulting a dictionary, should be encouraged to yield more accuracy of learning gains.

According to this study's results, in order to facilitate lexical inferencing, selection of reading texts should be taken into account. The text content or topics should be familiar to learners, so they can take advantage of their strong background knowledge to compensate for lexical inferencing. This helps them to lessen worry about content, concentrate better on vocabulary gaps, and infer words more accurately. Another consideration was on lexical features of reading texts since learners' vocabulary knowledge plays a vital role. The larger proportion of words they know in a text, the better they can infer the rest. It was suggested that knowing at least 95% of words in a text, or the optimal 98%, can enable learners to gain adequate reading comprehension and allow them to successfully infer some of the new words (Nation, 2007; Nation, 2010). To select proper texts, learners' vocabulary size can be measured by some vocabulary tests (See Webb and Sasao, 2013), and lexical profiles of texts can be analyzed by some corpus-informed tools.

Therefore, texts can be chosen appropriate to learner's vocabulary proficiency, hence fostering lexical inferencing.

This study still has some limitations. Although the research was designed to reflect reading in naturalistic settings, there was one condition that the participants were not allowed to use a dictionary. The results might have changed if a dictionary had been available. Besides, given the small number of participants, generalizability must be cautioned. Future research can also be conducted with more participants or more reading passages with different genres to be read at different times.

Acknowledgements

About the Authors

Nuttapong Rutamornchai: An M.A. student in Applied Linguistics for English Language Teaching at King Mongkut's University of Technology Thonburi (KMUTT), Thailand. His area of interests is lexical inferencing, vocabulary learning, and language learning strategies.

Saowaluck Tepsuriwong: An assistant professor at Department of Language Studies, School of Liberal Arts, KMUTT. She obtained a Ph.D. in Applied Linguistics from University of Reading, the UK. Her research interests include language learning strategies, learner autonomy, courses and materials development, and teacher training and development.

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