



“Un-/dis-connected” Aren’t They Interchangeable?: Investigating L2 English Learners’ Sensitivity to the Form-Meaning Link of Words with Negative Prefix Rivalry

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ABSTRACT

This mixed-method study investigates L2 acquisition of English negative prefix rivalry, a topic still underexplored. The central question is whether L1 Thai learners realize that English **un-dis** word pairs (e.g., **unconnected** versus **disconnected**) have different meanings. English has many negative prefixes, so such word pairs are prevalent, causing critical challenges. Despite both being negative, they differ in nuances, and are mostly not interchangeable. *Un-* and *dis-* are the most polysemous prefixes whose meanings also overlap, adding further confusion. Under the joint framework of cognitive semantics and the interlanguage hypothesis, we designed two form-meaning link tasks (i.e., without and with contexts) with follow-up interviews. Results indicated deeper problems at the

	prefix level. The flawed knowledge of negative prefixes caused them to have low sensitivity to each word's meaning. L1 interference and ineffective instruction tended to be the main causes. However, with contexts, their sensitivity significantly improved ($p < .001$), indicating the necessity that contexts be present for the inference of this kind of word. The findings could reflect similar yet unnoticed problems in other L2 or even L1 contexts, as negative prefixation is filled with inherent complexities. The implications for material developers and teachers are therefore broadly applicable. Keywords: negative prefix rivalry; English negative prefix; cognitive semantics; SLA; L1 interference
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Introduction

English has many negative word pairs (e.g., *unconnected* versus *disconnected*, and *unarmed* versus *disarmed*). This phenomenon is not merely theoretical but filled with complexities that challenge learners' acquisition. There are many negative prefixes, each with multiple meanings, especially *un-* and *dis-*. Moreover, their meanings overlap (Bauer & Nation, 1993; Bauer et al., 2013; Hamawand, 2009). Hence, there comes a critical question: are the word pairs interchangeable? Or, if different, how? In what context would *unconnected* be chosen instead of *disconnected*? A pause you might take or a lack of confidence already indicates something. Indeed, these words are special vocabulary. Their meanings differ in nuances, hidden yet significant enough to prevent interchangeability. Learners' dictionaries have not clearly addressed this ambiguity (Hamawand, 2009; Kwon, 2001), so learners, especially L2, can easily be misled by their façade of mutual base + fellow negative prefixes, which emphasizes meaning similarity. Unlike their L1 counterparts who get extensive exposure from real uses, L2 learners learn these prefixes through deliberate and often decontextualized classroom instruction (Iwaizumi & Webb, 2021). Based on the current body of research, how they acquire negative prefix rivalry remains a mystery. We turn this into the central question of this study.

Literature Review

The acquisition of negative prefix rivalry is a complex and interdisciplinary topic. Therefore, we first discuss the linguistic issues (i.e., negative prefix rivalry and the framework, cognitive semantics), to systematically handle its inherent complexities). For the SLA side, we provide

a comparison of the English-Thai negation system and another framework, the interlanguage hypothesis (IL). Gaps are addressed in the final subsection.

Negative Prefix Rivalry Under Cognitive Semantics (CS)

Negative prefix rivalry has rarely received the full spotlight, occupying only a small part in a broader discussion of negative prefixation. When addressed directly, it has been explored through a corpus linguistics approach, and meaning differences are generally noted (Bauer et al., 2013; Hamawand, 2009; Kwon, 2001; Kjellmer, 2005). However, different frameworks make it hard to draw a systematic explanation. In fact, the explanation is structurally built on negative prefixation, a topic already filled with considerable complexity. In this study, we follow Hamawand (2009) who comprehensively tackled both topics' complexities with the help of cognitive semantics. This framework, which aims to describe meaning based on real usages and thus does not ignore nuances or subtle meaning differences, gives systematic answers to those lingering questions mentioned above.

Cognitive semantics (CS) is not a single theory, but a collaborative approach which considers that minds and language work closely together. Therefore, CS theories argue against formal semantics that highlight truth conditions (i.e., meaning = referent). Instead, meaning equals conceptualization, emerging from our minds, and expanding beyond real-world referents. *Colorless green ideas sleep furiously* can thus be meaningful in a figurative sense (Geeraerts, 2021), and so are non-compositional expressions like metaphors and idioms. Secondly, conceptualization occurs in context. Humans are “embodied” beings, not “pure minds” (Geeraerts, 2021, p. 24). What we conceptualize is grounded in what our bodies experience (Langacker, 1997). Therefore, thirdly, a sharp semantics-pragmatics division is denied, leading to the other core that meaning is not fixed but changes along with the world. With these cores, CS offers theories to systematically tackle any linguistic cases previously marginalized or concluded as arbitrary merely because they are unexplainable by standard rules. It turns out that these are the cases that learners and teachers, especially non-native ones, have problems with (Tyler, 2017).

Negative prefixation is among such problems. Numerous prefixes convey negation (i.e., indicating something opposite) both directly (e.g., *un-*, *dis-*, *in-*, *non-*) and connotatively (e.g., *hyper-*, *quasi-*). Polysemy and meaning overlap are also common. Moreover, negative prefix rivalry, which, by being directly affected by all the earlier issues, adds even more complexities.

At the prefix level, Hamawand (2009) adopted Langacker's cognitive domain theory to organize their multiplicity and polysemy. Domains are a coherent area of conceptualization (Evans & Green, 2006; Hamawand, 2009),

an area in our minds that provides background information for conceptually related prefixes. Each domain represents negation in a certain way. To illustrate, distinction (NOT),¹ privation (LACK), removal (REMOVE), and reversal (UNDO) are domains that both *un-* and *dis-* fall into. In other words, each prefix has various meanings that overlap.

However, they do carry different specific meanings. Based on the corpus analysis, for example, it was argued that *un-* conveys privation related to situations such as *unrest*, while *dis-* concerns people such as *disrespect*. The fact that it would be peculiar to switch (e.g., **disrest*) is one proof that while being under the same domain, the prefixes are not completely synonymous. Indeed, this theory illustrates the way meanings exist connectedly in real life (e.g., if we understand *Influenza A*, we also understand *Covid-19* because they share the same background knowledge of the concept ILLNESS. Without it, we cannot understand either of them). This theory also provides what most dictionaries lack: prefixes are no longer listed in separate entries without connections or clear comparisons.

At the word level, Langacker's construal theory helps highlight and explain the nuances between the seemingly similar expressions, the word pairs. Construal refers to our ability to "conceive and portray the same situation in alternate ways" (Langacker, 1997, 2015). A word meaning includes not only conceptual content (i.e., conventional linguistic meaning) but also construal based on a specific context. In case of the negative word pairs, they share the same concept (i.e., mutual base + central negative meaning), yet carry different construals. These nuanced differences are argued to be linguistically encoded by different prefixes.

This happens in the process of communication, which begins with conceptualization. People first choose a suitable base according to the immediate context. Right after, specific details in that context make us construe the base in a certain way. Then we immediately choose a certain prefix to highlight that chosen facet of the base, and finally, a derivative with a distinct meaning is born. As Hamawand (2009) asserts, "because the base is multi-faceted, the speaker has the chance to construe it alternatively and use different prefixes to represent the construals" (p. 127).

When the perspective is shifted from communication to analysis, Hamawand (2009) employed corpus and usage-based linguistic approaches since these approaches share the same premise as cognitive semantics—linguistic units emerge from real usage. Therefore, "the context in which an utterance is used is the best evidence available in accounting for its interpretation" (p. 18). Comparing sentences consisting of word pairs,

Hamawand used collocates to shed light on the hidden construals to eventually differentiate their nuanced meanings.

To illustrate, he compared “He was totally *unqualified* for his job as a senior manager,” with “He was *disqualified* from the competition for using drugs” (p. 147). According to his corpus and dictionary analyses, *disqualify* collocates with words like *athlete*, *candidate*, and *team*, while its rival collocates with words related to jobs, such as *manager*, and people’s deeds, such as *praise* and *rejection*. Therefore, although both words convey the general meaning of “not qualified”, the evidence proves that “only *dis-* implies actions that are beyond one’s control” (pp. 147-148). In other words, if someone is disqualified, they are stripped of a qualification rather than simply having none from the start. In short, *un-* here highlights negation in terms of LACK, while *dis-* highlights REMOVE. Speakers do not naturally use the two terms interchangeably.

The previous example represents rivalry between prefixes of different domains. It can also occur within the domain, although the nuances are not always significant enough to prevent interchangeability. Hence, this study focuses only on the former, which clearly indicates negation in different ways. In short, a construal theory provides a clear system to separate the pair, the one that pays attention to the factors often underplayed by previous studies: real language usage and the role of different prefixes.²

Negation in English and Thai

English

English relies on both syntactic (i.e., negators) and affixal negation. However, as an inflectional language, negation through prefixes is pervasive. Though their derivatives are not necessarily negative (e.g., *unintentional*), the prefixes themselves contain some sense related to negation, either denotatively or connotatively. This study mainly focuses on the denotative ones, indicating the opposite of the base. Hamawand (2009) assigned a group of primary negative prefixes that include the following concepts: distinction (NOT), privation (LACK), removal (REMOVE), and reversal (UNDO). The NOT domain, a standard negative, houses many prefixes: *unusual*, *dishonest*, *inappropriate*, *non-standard*, *atypical*, and sometimes *mis-* as in *misfit* (Joshi, 2012, 2020). Each of the three other domains houses three prefixes: *un-*, *dis-*, and *de-* (e.g., *deform* for LACK, *discredit* for REMOVE, and *undo* for REVERSE). To reiterate, *un-* and *dis-* have all these meanings.

However, the categorization is not always clear-cut, particularly with REMOVE and REVERSE domains (Cartoni & Lefer, 2011). *Unwrap*, *disarm*, and *deselect* are some examples that can be interpreted as both. Likewise, Joshi (2020) mentioned that *unfriend* is “the reversal of this action of ‘friending’ someone; that is the removal of someone from one’s friend list” (p. 83). The aforementioned studies agreed that REMOVE is born when a prefix is added to a noun, and REVERSE to a verb. The fuzziness may arise partly because some bases act as both. However, there is a consensus that English has many distinguishable negative concepts and prefixes, and that each prefix is often polysemous, facilitating its use in diverse contexts.

Thai

Thai is an isolating language. Native words are polysemous and multifunctional by themselves, requiring no inflection to diversify their usages (Thonglor, 2021). Thus, negative prefixes in use are borrowed from Pali-Sanskrit. However, the number is less than that of English. Moreover, each is quite limited in its negative meaning. Besides, they are formal and very rarely used in everyday life. See details in Thonglor (2021) and Iwasaki and Ingkaphirom (2005). Instead, syntactic negation through the negator /mây/ (NOT) is widespread. The word has various usages, for example:

1. Negate main verbs

kháw ***mây*** *maa*
 he negator come
 ‘He does not come.’
 (Iwasaki & Ingkaphirom, 2005, p. 17)

2. Negate auxiliary verbs

kháw ***mây*** *khəəy* *tam*
 he negator auxiliary do
 ‘He has never done it.’
 (Iwasaki & Ingkaphirom, 2005, p. 14)

3. Formulaic expressions

mây *pen* *ray*
 negator copula what
 ‘It doesn’t matter.’
 (Iwasaki & Ingkaphirom, 2005, p. 227)

4. In front of the pattern [copula /pen/ + noun] that behaves like an adjective

mây *pen* *thammachât*

negator copula nature

'It is not natural/ unnatural.'

(Iwasaki & Ingkaphirom, 2005, p. 228)

In addition, many of the English prefixally negated words are often translated to /mây/ words; for instance, *irrelevant* as /*mây* *kàw*/, *impossible* as /*pen* *pay* *mây* *dây*/ (Smyth, 2014), including many examples mentioned earlier, although some do not come from the NOT domain in English:

English

unusual (NOT)

dishonest (NOT)

inappropriate (NOT)

unrest (LACK)

disrespect (LACK)

discredit (REMOVE)

Thai

mây *pòk* *kàtì*

mây *sûusât*

mây *mòs* *sóm*

kwaam *mây* *sàh* *òp*

kaan *mây* *kanróp* (noun) /

mây *kanróp* (verb)

mây *hây* *kàt*

In summary, while English utilizes a lot of prefixal negation, Thai utilizes a lot of syntactic negation through the main negator /mây/ (NOT).

Interlanguage Hypothesis

Interlanguage (IL), coined by Selinker (1972), refers to a language existing in the cognitive processing of L2 learners, separating from L1 and the target language (TL). This theory can explain L1 Thai learners' problems with English negative prefix rivalry. Many characteristics of IL validate its status as a language. It is self-creative, including not only L1 and TL features but also what learners create themselves. These IL features are not random but occur frequently enough (i.e., learners keep producing them) to form a pattern (e.g., an omission of the 3rd person singular morpheme). Besides, it is dynamic. IL involves correct and incorrect rules, but learners are often unaware of that and even of the existence of IL, thinking they are producing the TL (Tarone, 2018). However, when they realize that their hypothesized correct rule is wrong and are ready to change, that IL feature gradually evolves, repeatedly in a continuum.

However, this need not lead to native-like competence. Fossilization or the fact that learners stop developing despite gaining more instruction is prevalent (e.g., L1 French learners keep producing the uvular /r/ when speaking English). In short, IL is a unique language, comprising different

features whose developments vary. The common element is that each bears a chance to be fossilized.

At least five psycholinguistic processes were argued to affect IL and its fossilization (Selinker, 1972). Firstly, language transfer from L1 can play a role as aforementioned. Secondly, the transfer of training relates to the effects of instruction. For instance, L1 Thai learners faced problems with the English modal wish-clause *could + have + past participle* structure likely because it was not included in the teaching materials (Suteerapongsit, 2020). The third and fourth may overlap as they both pertain to personal strategies. One concerns communication (e.g., prioritizing the flow of communication rather than grammaticality), and the other concerns learning strategies (e.g., mnemonic devices [Tarone, 2018]). Lastly, overgeneralization is the application of general rules to irregular contexts (e.g., using a past *-ed* marker for all verbs like **eated*). The present study hypothesized that the first two processes account for L1 Thai learners' problems with negative prefixation.

Addressing the Gaps

Despite their valuable theoretical analysis of negative prefix rivalry, the previous attempts still leave a significant gap regarding how learners, especially L2, acquire these nuanced differences. The same is applied to pertinent studies in SLA. One of the most related groups is the one on morphological awareness (MA)—the conscious awareness of morphemes' structures and meanings and the ability to manipulate them according to word formation rules. The acquisition of negative prefixes directly falls under it. However, many studies investigated different types of MA (i.e., inflectional, derivational, and compounding) altogether (Kallayanamit, 2019; Sukying & Matwangsang, 2022; Zhang & Koda, 2013). Even for the ones with a specific investigation, both prefixes and suffixes or different types of each were simultaneously targeted (Amirjalili & Jabbari, 2018; Kim, 2013; Mochizuki & Aizawa, 2000).

The same trend is found in lexical inferencing studies. Lexical inferencing refers both to the action and strategies of guessing word meanings using different clues (e.g., morphological, contextual, world knowledge). Studies in this realm generally select target words from textbooks or texts developed by notable previous studies (Hassanzadeh et al., 2019; Nassaji, 2004), hence the coverage of varied words.

Thus far, two gaps are evident: 1. Studies on negative prefix rivalry are deeply rooted in corpus linguistics; 2. Studies on L2 acquisition of English morphology and vocabulary mainly focus on the big picture. These gaps exist despite an intriguing multitude of negative prefixes and their polysemy, particularly the most polysemous *un-* and *dis-* whose meanings also overlap

(Bauer & Nation, 1993; Bauer et al., 2013; Hamawand, 2009). It is likely difficult for L2 learners to realize which prefix meanings are competing, or even that there actually is a competition (i.e., being misled by the similar façade of the two words). Hamawand (2009) tackled this topic mainly on theoretical grounds; the question about how well language learners will be informed of the hidden construals between the word pairs from contexts is still open. Moreover, in the case of L2 learners, there is another dimension to consider: the encounter between the benefits of contexts and learners' pre-existing L2 problems.

We bridge these gaps by shedding light on their acquisition of negative prefix rivalry to draw novel conclusions and implications that benefit various disciplines. In short, we attempt to answer the following research questions:

RQ1: How does L1 Thai learners' sensitivity to the form-meaning link of English word pairs with *un-* and *dis-* prefix rivalry differ when the words are not/are presented in contexts?

RQ2: Does the sensitivity differ to the extent that the existence of context is necessary when L1 Thai learners infer English word pairs with *un-* and *dis-* prefix rivalry?

RQ3: What are the possible causes of the common problems that L1 Thai learners face when encountering English word pairs with *un-* and *dis-* prefix rivalry?

Methodology

Participants

L1 Thai high school learners are the target population because: 1. They largely receive formal instruction on affixes from the junior high school level, so by the high school level they should know common prefixes (e.g., *un-* and *dis-*) to a reasonable extent; 2. Words with prefix rivalry largely fall in the mid-frequency range, the range found in academic texts that they are to use at university (N. Schmitt & D. Schmitt, 2012).

Purposive sampling was employed with two criteria: 1. High school students at the CEFR B2 level (upper-intermediate); 2. No more than three-month experience in an English-speaking country or international school. B2 students can comprehend complex texts (Council of Europe, n.d.), hence suitable as contexts in this study were not always in simple sentences. The standardized EF Standard English Test (EF Education First, 2014) was used to qualify them. Finally, the data from the 30 participants was analyzed. This study was approved after a full-board review by the university's Research

Ethics Review Committee in July 2024. Informed consent was obtained from all participants and their legal guardians.

Target Word Selection (UnX Versus DisX)

Un- and *dis-* words were initially drawn from the previous studies and two corpora, MorphoQuantics (Laws & Ryder, 2014) and The Corpus of Contemporary American English (COCA) (Davies, 2008). Rigorous screening was conducted based on three main criteria: 1. Their base must be the same (i.e., not homonyms); 2. There are clear meaning differences and no overlapping; 3. They must not be low-frequency words (Anthony, n.d.; N. Schmitt & D. Schmitt, 2012).

Afterwards, to control any extraneous variable from different word classes (i.e., while *un-* words are *-ed* adjectives, most *dis-* words are verbs), we conjugated *dis-* words into the past participle *-ed* form. They were also presented in Task 2 (i.e., where words come in contexts) not in a predicative passive voice format but as premodifiers to ensure comparability with *un-* adjectives. Finally, there were 8 valid pairs whose meanings are distinct from each other (see Table 1).

Table 1

Eight Target Pairs (Conjugations Applied)

<i>un-</i>	Meaning	<i>dis-</i>	Meaning
<i>unarmed</i>	NOT	<i>disarmed</i>	REMOVE
<i>unassociated</i>	NOT	<i>disassociated^a</i>	REMOVE
<i>unclaimed</i>	NOT	<i>disclaimed</i>	REMOVE
<i>unconnected</i>	NOT	<i>disconnected</i>	REMOVE
<i>uninfected</i>	NOT	<i>disinfected</i>	REMOVE
<i>unproved</i>	NOT	<i>disproved^b</i>	WRONG
<i>unqualified</i>	NOT	<i>disqualified</i>	REMOVE
<i>unused</i>	NOT	<i>disused</i>	REMOVE

Note.

^a A spelling variant, *disassociated*, is lower in frequency.

^b Corpus information provides an additional meaning of *dis-*: wrong (e.g., *disprove* means “prove to be false or wrong”). The fact that it differs from the majority did not prevent it from being confused with its *un-* counterpart.

Instruments

The Two Form-Meaning Link Tasks

The form-meaning link construct can reveal whether the participants can differentiate between word pairs. Hence, the two tasks had the participants choose the correct meaning for each word provided one by one. All items included one correct and two incorrect options (i.e., the rival word's meaning and the both-correct answer). Each underwent the Item-Objective Congruence assessment by three experienced native English professors. To ensure comparability, the two tasks differed mainly in the existence of context.

Task 1, MRT, was the traditional meaning recognition test (Schmitt, 2010).

Disarmed

- a) Weapons taken away from someone
- b) Not carrying any weapons since the beginning
- c) Both a) and b) are correct.

Task 2's format was slightly modified. The words were presented in sentential contexts. The options were sentences describing comprehension rather than literal meaning. This was to prevent the similarity to Task 1, which could invite the use of personal strategies. Task 2 is called a context-based meaning recognition test (CMRT).

Due to gun control, the entire population of this country became **disarmed** people, except for the military and police.

- a) The people had no weapons before gun control.
- b) The people had weapons before gun control, but weapons were taken away from them.
- c) Both a) and b) are correct.

All sentences were carefully adapted from academic or newspaper sections in COCA (Davies, 2008). The main criterion was that the frequent collocates must be included to highlight the words' common usages. However, the chosen collocates must not be synonyms, antonyms, or words having close meaning (i.e., *disinfected* and *clean*) because these collocates are not always present in real situations. Rather, neutral collocates (e.g., *groups* and *unassociated*) were chosen, and the context clues worked in a sentential level (i.e., letting the whole sentences illustrate the words' meanings) (see both tasks in Appendices A and B).

Stimulated Recall Interview

One-third of the participants were randomly selected for individual semi-structured audio interviews. The stimuli for the recall were their scores. The questions were asked in Thai to prevent language barrier issues, and covered their knowledge of word pairs, negative prefixes, their errors in the tasks, and their experiences in learning this topic (see Appendix C).

Data Collection and Analysis

The pilot study was conducted, which allowed minor adjustments to be made to the tasks and software. During the real data collection, all participants completed Task 1 (MRT) (20 minutes) and Task 2 (CMRT) (40 minutes) in order. One-third did the interview within five days after (30 minutes/each session). All processes were conducted online to make it convenient for diverse participants. Everyone was given strict instructions and a code of conduct to follow. Data from the participants with suspected misconduct were eliminated.

For score analysis, the participants had to get two words in the pair correct to earn one point. Therefore, the full score for both tasks was eight (i.e., for eight pairs). However, the separate scores for *un-* and *dis-* words (i.e., each full score was also eight; one point for one word) were also considered to further explain the main results. Overall, there were two sets of scores (i.e., of Task 1 and 2) from the same participant group. Paired samples *t-tests* were conducted to show whether the differences were significant. For the interviews, thematic analysis was adopted. It was mainly deductive as themes were constructed mainly within the frame of each interview question.

Results

This section presents the results from each instrument and some primary analyses that were prerequisites for the holistic interpretation in the discussion section.

Task 1 (MRT)

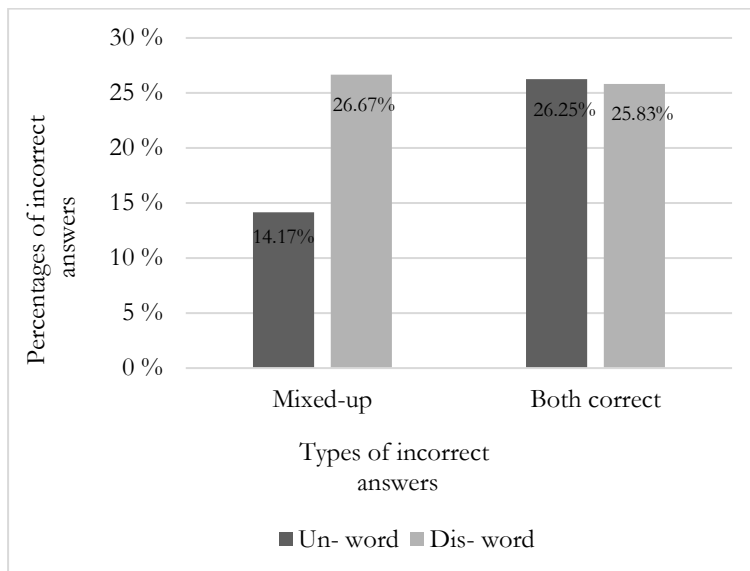
The individual *un-* words' mean score was 59.58% ($SD = 2.27$) while that of *dis-* words was 47.50% ($SD = 2.54$). Both centered around half, indicating that participants had a moderate knowledge of each prefix. The score for the mutual correct answers (e.g., getting both *unarmed* and *disarmed* correct) was 35.83 ($SD = 2.50$). This indicates a low sensitivity to the form-meaning link of the word pairs.

In terms of their incorrect answers (see Figure 1), participants chose the meaning NOT for *dis-* words a lot more than the opposite case (26.67% to 14.17%). In fact, NOT is the meaning of *un-* in this task while *dis-* mostly means REMOVE (see Table 1). This result, together with the higher number of *un-* correct answers, could indicate participants' strong connection with NOT. Another dominant result was that participants chose both-correct answers to a certain extent, indicating another problem—vague knowledge of each prefix's meaning.

In short, Task 1 simulated a situation when L1 Thai learners encountered these words without context. The results revealed clear difficulty in inferring them and some underlying problems.

Figure 1

The Incorrect Answers from Task 1 (MRT)



Task 2 (CMRT)

In this task, the same set of words was presented in sentential contexts. The mean scores were 78.33% (*un-* words) ($SD = 1.34$) and 67.92% (*dis-* words) ($SD = 2.27$). The pattern echoed the results in Task 1 (MRT), where *un-* scores were higher. However, both increased by about 20%. Correspondingly, the score for the mutual correct answers rose to 55.42% ($SD = 2.27$), also a roughly 20% increase. The paired samples *t-test* results revealed that all the increases were statistically significant ($p < .001$).

Furthermore, the increase generally matched up with the decrease in errors. The mixed-up errors on *dis-* words reduced from 26.67% to 20.42%. In other words, participants increasingly realized that *dis-* here means REMOVE. Nonetheless, the most striking result was that both-correct errors clearly reduced for both prefixes (i.e., down to 6.25% for *un-* and 11.67% for *dis-*).

Semi-Structured Stimulated Recall Interview

Participants' Previous Experience and Knowledge

Almost all ten interviewees reported that they were unaware that word pairs like this exist. Most stated that they were taught only individual words. For the rest, one expressed, “kind of realize, but confused about the meanings.” Another mentioned that her teacher once taught her, and she “remembered the way to differentiate for a while but already forgot.”

When further asked to give meaning(s) for each prefix one by one, six unconfidently stated that both solely mean NOT. A few of those mentioned the possible subtle differences in terms of usage, but struggled when asked to elaborate. For the others who mentioned the differences, their answers were roughly correct (e.g., stating that *un-* means LACK, NOT, and *dis-* means NOT, REMOVE). However, they did not confidently and clearly express these differences.

All of them reported receiving formal affix instruction at the junior high school level. However, seven emphasized tutoring schools. Some even stated that tutoring schools came to mind first.³ Most interviewees commonly stated that their formal schools regularly focused on grammar. Vocabulary was mainly taught based on topics in each textbook chapter. Affixes were formally learned through tutoring schools that often listed them in tables.

Task Completion

There was an interesting finding related to the selection of both-correct answers. Four interpreted the option REMOVE to mean NOT (e.g., thinking that ‘connection being **removed**’ meant ‘**not** being connected’ anyway). Interestingly, these people were among the six who cited NOT as a sole meaning for both prefixes. Again, this emphasized that they likely associated negative prefixes with NOT.⁴

Another dominant finding was that all stated that Task 1 was a lot harder, saying that they felt truly unsure of their answers. One even admitted to feeling like “knowing nothing.” By contrast, for Task 2, they commonly agreed that contexts helped “clarify” the meanings.

Discussion

RQ1: Difference in Learners’ Sensitivity Between the Two Tasks

Our hypothesis that learners’ sensitivity would be higher in Task 2 (CMRT) was confirmed based on the statistically significant increase of roughly 20% in every component (i.e., *un-*, *dis-*, and mutual correct answers, i.e., word pairs) ($p < .001$) (see Table 2). The interview findings also corroborated these quantitative results.

Table 2

Comparison of the Two Tasks’ Correct Scores

Components	Task 1 (MRT)		Task 2 (CMRT)		Sig. (1-tailed p)
	Mean in %	<i>SD</i>	Mean in %	<i>SD</i>	
<i>un-</i> word	59.58%	2.27	78.33%	1.34	< .001
<i>dis-</i> word	47.50%	2.54	67.92%	2.27	< .001
Word pair	35.83%	2.50	55.42%	2.27	< .001

However, there is a noteworthy point regarding the distribution of scores in both tasks. The standard deviation (*SD*) indices were mostly greater than 2 (see Table 2). The indices in Task 1 (MRT) highlight that the participants’ prior knowledge regarding negative prefixes varied despite their similar proficiency level (CEFR B2) and similar exposure to formal English instruction. For Task 2 (CMRT), the still-high *SD* on *dis-* words, which, in turn, affected that of the word pair, indicated that despite the help of contexts, the problems of strong association with NOT and vague knowledge still affected many participants.

Based on the overall results, the answer to RQ1 could be concluded as: L1 Thai learners’ sensitivity was significantly higher in Task 2 (CMRT), so the benefits of contexts were clearly observed. However, the benefits were not equally shared among participants, potentially because of their varied prior knowledge and experience (e.g., some instruction might have strongly emphasized NOT). This point is addressed more in RQ3.

RQ2: The Found Difference Indicates the Necessity of Contexts or not?

Our holistic interpretation of every result and theoretical framework convinced us that the answer is ‘yes’. Although not all participants received equal benefits from the contexts, the overall 20% statistically significant increases in every component and the corresponding interview findings were promising. The problem of strong association with NOT when it came to seeing negative prefixes might not decrease tremendously (i.e., mixed-up errors on *dis-* decreased from 26.67% to 20.42%). However, the vague knowledge of each prefix (i.e., as seen from both-correct errors) was clearly alleviated by contexts (20% reduction for *un-* words and approximately 14% for *dis-* words).

As previously discussed, Task 1 (MRT) simulated a common situation where L1 Thai learners encounter these words alone, such as in the exercise, a vocabulary list, or dictionary. Considering that the word pairs share the same façade (i.e., mutual base + fellow negative prefixes), it is often difficult for non-native learners to be sensitive to such nuanced meaning differences. This is because it requires the correct knowledge of each prefix’s meanings first, which, as we have presented, was clearly flawed and incomplete. While there could be learners who have a good grasp, the multiplicity (i.e., many negative concepts coexist) and complexity of the topic (i.e., each prefix is polysemous, e.g., both *un-* and *dis-* have up to four meanings) likely cause confusion. For instance, when encountering *unarmed* and *disarmed*, one might wonder which meaning each prefix takes, and whether it takes the same one. But with contexts provided, the chosen meaning automatically gets highlighted, as can be seen from the following example:

Due to gun control, the entire population of this country became **disarmed** people, except for the military and police.

- a) The people had no weapons before gun control.
- b) The people had weapons before gun control, but weapons were taken away from them.
- c) Both a) and b) are correct.

To reiterate, this hypothesis was formed based on Hamawand’s (2009) method of demonstrating meaning differences between the word pairs by comparing sentences and collocates. This was in turn based on the principle of the cognitive semantics (CS) approach in which meaning is born from our conceptualization based on contexts (e.g., Evans & Green, 2006; Langacker, 1997; Luo, 2021). Hence, word meanings do not include only conventional and fixed concepts, but they always include a *construal* or how we conceptualize and portray a specific situation according to the details in that context. The central argument is that word pairs have the same general

conceptual content of the base and the central negative meaning of the prefix, but they carry different construals. Each distinct construal is linguistically encoded through each prefix (i.e., either *un-* or *dis-*), which bears significant nuances extending beyond its core negative denotation. To shed light on that hidden construal, the words should be presented in appropriate contexts, the beginning of everything. Indeed, these are not like normal vocabulary that contexts *could help* or are *helpful* in inferencing them (Nassaji, 2004). In fact, they behave like synonyms, so they *need* the context to clarify the significant nuances hidden behind the similar façade.

Overall, the differences clearly reflected the difficulty (from the first scenario: no contexts) and benefits (from the second scenario: with contexts) learners experienced. The importance of contexts for this type of word was also highlighted by the pioneering study Hamawand (2009) and were in line with the underlying theoretical framework of cognitive semantics (CS). All have led us to conclude that contexts are not merely helpful, but truly necessary.

RQ3: The Possible Causes of the Common Problems

There were three common problems found: a strong association with NOT, vague knowledge of each prefix, and an unawareness of the existence of word pairs. Two psycholinguistic factors (Selinker, 1972) were believed to be the cause.

L1 Interference

There are considerable differences between the English and Thai negation systems. The local negative prefixes lack a wide range of negative meanings. This limitation likely hindered L1 Thai learners from realizing other meanings besides NOT—the only obvious counterpart. Furthermore, the prefixes are limited to formal words. Everyday negation is largely conveyed through the negator /mây/ (NOT) due to its versatility. Many prefixally negated words in English are translated to /mây/ words, even for those whose prefix does not originally mean NOT; for example, *unrest* (LACK) is translated to *kwaam mây sànpòp*. Overall, these L1 issues likely contribute to the participants' strong association with NOT and their vague knowledge (see Negation in English and Thai).

Furthermore, this lack of transfer does not receive help from other factors such as loanwords. For example, Mochizuki and Aizawa (2000) reported that their L1 Japanese participants got *un-* and *non-* correct a lot, potentially because Japanese used loanwords from English such as *anrakkī* (*unlucky*), and *nonstoppu* (*nonstop*). This was similar to the shared cognates

between Western languages (Briceño, 2017; Pacheco & Goodwin, 2013). For this case, the closest example is the similar prefix *ə-* (/ə/) (NOT) and *a-* (NOT) in English, but they fell out of the scope of this study.

In general, this corresponded with previous studies that found an influence of L1 on L2 acquisition of morphology. However, in the Thai context, it contradicted Kallayanamit (2019). Her study focused on clearly noticeable structure: multiple derivation (e.g., *inter-nation-al* which Thai does not have) and bound roots (i.e., Thai relies more on free roots). L1 interference was not observed, reportedly because the participants' long-term exposure to the English derivation system was said to already help them acquire that knowledge. In contrast, we investigated nuances in meaning, which are harder to notice on the surface and require more focused instruction, which the participants failed to receive. However, the different results suggest that if the participants were to receive a timely and effective instruction on this topic, the effect of L1 interference could be reduced.

Transfer of Training (Selinker, 1972)

There appears to be several problematic issues in negative prefix instruction in the Thai system. Most interviewees reported having received only incidental instruction in their schools. Figure 2 shows the example, taken from one of the textbook series approved by the Ministry of Education in Thailand, of how negative prefixes appear only as a part of topic-based vocabulary. Correspondingly, the interviewees reportedly have rarely been advised that word pairs could exist, leading to their unawareness. This insufficient instruction explains why more than half of the learners emphasized the formal instruction they received from tutoring schools.

Figure 2

Example of an Incidental Negative Prefix Instruction in a School Textbook

*** Personality adjectives**

b Complete the list of adjectives. Write the opposite of each word.

Positive	Negative
friendly	unfriendly
organized	
kind	
.....	dishonest
.....	lazy
polite	
.....	miserable
relaxed	

c Complete the sentences with an adjective from Exercise 8b. The missing word begins with the first letter of each person's name!

- 1 Ursula never says hello when she sees you on the street. She's very *unfriendly*.
- 2 Robbie never gets nervous before a test. He's always
- 3 Lucy never does any work. She's very
- 4 Peggy's very She always says please and thank you.
- 5 Mike's feeling today. He had an argument with his father.
- 6 Don't believe anything that Debbie says. She's very
- 7 Dave is really There are papers everywhere on his desk!
- 8 Everybody likes Frank. He's very

Note. Puchta and Stranks (2015, p.11).

However, as several interviewees reported, tutoring schools often present affixes in a compact table. Figure 3 presents an example teaching material from a comprehensive junior-high-school-level grammar course of a widely recognized English tutoring school. There are some noteworthy flaws. For example, *un-* has only NOT, hence emphasizing the strong association with NOT. For *dis-*, both NOT and REMOVE were given, but some derivatives tend to be too difficult. The meaning of *digress* ('to move away from the topic') is not transparent, in that it cannot be directly inferred from the combination of prefix + root (i.e., *-gress-* is from Latin). It is also a low-frequency word, and as is *dismount*. Furthermore, the word pairs are not presented. Although it is a normal practice that tutors will elaborate, the material undeniably plays a big part in shaping learners' understanding.

Figure 3*A Prefix Table from a Tutoring Material*

PREFIX และ SUFFIX ที่ควรรู้		
PREFIX		
Prefix	Meaning	Examples
a-, an-	not, without	apathy, anarchy
anti-, ant-	opposing, against, the opposite	antibiotic, antagonist, antisocial
de-	_____	descend, despair
dis-, di-	negation, removal	disadvantage, dismount, digress
ex-	out, previous	exit, exclude, ex-wife
extra-	outside, beyond	extracurricular, extramarital
in-, il-, im-, ir-	not, without	inappropriate, impossible, irresponsible, illegal
over-	excessively, upper, over	overconfident, overjoyed, overcoat, overcast
post-	_____	postpone, postgraduate
pre-	before in time	pretest, predecessor
re-	_____	replay, repay
sub-	_____	_____
un-	not	unfulfilled, uncomfortable

Note. Enconcept academic team (2021, p. 82).

Besides the incomprehensive and decontextualized instruction, the fact that learners largely undergo tutoring for high-stakes exams (Charoenroop, 2021) suggests that the knowledge they gain from it may not be long-lasting. To illustrate, many admitted that they formally learned this in the final year of junior high level when they started receiving tutoring for high-school entrance exams. The consequence of this learning-for-exam trend could be like what one interviewee shared, in which they “remembered the way to differentiate for a while but already forgot.” In fact, we could already see it occurring from the results.

In addition, one surprising fact that came to us during our research process was that the topic was included in the 2024 entrance exam of one of the top-tier high schools in Thailand. The students taking the exam reported⁵ encountering pairs like *un-/dis-qualified* and they had to choose one. One of the interviewees reported—without the researcher asking—“I encountered them for the first time in that exam. I felt really confused, didn’t know which one to choose.”

Indeed, while the high-stakes exam started to recognize the importance of this challenging topic, the training from both macro and micro levels could not properly prepare learners for it. To reiterate, the teaching of word pairs requires comprehensive instruction on negative prefixes first, but this fundamental instruction was already flawed in many ways. Hence, the answer to RQ3 could be concluded as follows: plenty of evidence has convinced us that L1 interference and transfer of training (Selinker, 1972) likely played a significant role in causing participants’ erroneous knowledge regarding negative prefixes and the word pairs. If this alarming issue is not fixed, it could become fossilized in the long term (Selinker, 1972; Tarone, 2018).

Implications

This study has generated new insights to applied cognitive semantics studies. We have demonstrated, following previous studies (e.g., Bielak & Pawlak, 2011; Bielak et al., 2013; Luo, 2021; Tyler, 2017; Tyler et al., 2011), that CS principles are valuable not only theoretically, but also practically.

To illustrate, teachers and material developers could adopt the CS-based explanation of English negative prefixation. The necessary first step is to make learners view language not as an *external* thing (i.e., rules), but *born from their own experiences*. This step does not need to be related to negation; it could employ newly created words, such as Google and TikTok, because they emphasize the connection between people’s experience and language.

Next, in relation to negation, a contrastive analysis of L1-L2 should be provided first and foremost. For example, as reported that Thai learners are most familiar only with *mây* (NOT), teachers must provide a list of English negative prefixes (e.g., *un-*, *dis-*, *in-*). Furthermore, other differing points should also be mentioned, such as that while *mây* mainly has a single meaning, each prefix in English often has more. This will expand learners’ worldview and knowledge, making it clear that negation is not limited to NOT.

Then, to overcome the limitations of current learning materials, each possible meaning should always be presented and clearly matched with each derivative (e.g., **un-**: *unnatural* [NOT], *unease* [LACK], *unwrap* [REMOVE], and *undo* [REVERSE]) (Hamawand, 2009). Providing learners with comprehensive meanings from the start (i.e., when they start learning affixes, which is in the junior-high level) should result in better learning outcomes.

After this step, the domain theory then comes in. A simple illustration of mind mapping showing each prefix (e.g., *un-* and *dis-*) residing in each nuanced meaning (which now behaves as a big concept of meaning) should be beneficial. This will highlight both prefixes' similarities and differences, showing how they are connected and thus pointing toward their potential rivalry. These are important pieces of information that learners cannot fully get from current learners' dictionaries, which mostly present each prefix individually without connections.

The previous steps eventually lead to the phenomenon of words with prefix rivalry (e.g., *unarmed* vs. *disarmed*), a key topic in English negative prefixation. Again, if there are no such pairs in learners' L1, this fact must be emphasized first (e.g., while Thai has no word pairs like this, English has plenty). Teachers must present them in contexts, which are the only source to shed light on the nuances behind the pairs' similar façade. It is noteworthy that synonyms and antonyms, which could guide the meaning even better, were excluded from our contexts because such words are not always present in the authentic texts learners see daily. However, teachers could employ those clear hints first and gradually reduce to neutral collocates, letting sentence-level contexts guide the meanings as we did. A juxtaposition (i.e., contrasting them side by side) will also highlight the rivalry.

Lastly, building effective morphological awareness (MA) requires time and focus; incidental instruction, as we have shown, does not work. Explicit teaching about morphemes and word formation rules is needed. Indeed, L2 learners are at a disadvantaged position due to the lack of transfer and natural English exposure. Strengthening their MA will compensate for these deficiencies and equip them with resources to leverage when learning other literacy skills.

Limitations and recommendations

We recognize some key limitations of this study. First, prioritizing other criteria to ensure the words' validity resulted in *un-* and *dis-* words having different frequency levels (i.e., *un-* [high] and *dis-* [mid]). To reduce potential interference, we emphasized that learners must make inferences based not on the whole words, but on prefix + base (already well-known to these CEFR B2 learners). The options also differed only in the prefix meanings, so we

believe the inference was largely minimized (see Appendices A and B). Second, some pairs were unfit with our task design, such as *unable* versus *disable* (both could not be similarly presented as pre-modifiers in Task 2), and *unsatisfied* versus *dissatisfied*, and *uncover* versus *discover* (one of their meanings overlaps). Still, they have significant meaning differences. Future studies should incorporate them if possible. Finally, we generalized the results to L1 Thai learners with CEFR B2 proficiency (upper-intermediate), particularly the ones educated in Thai schools. Interestingly, a very large number of interested applicants were at the B1 (intermediate) level. Examining this group should provide a more complete representation.

Conclusion

This study was inspired by our own inability to clearly differentiate between word pairs as L2 English learners. However, we found that the problems lay deeper than the rival words themselves. Indeed, not knowing “how are they different?” indicated major flaws in L1 Thai learners’ morphological awareness (MA), which, in turn, pointed toward deeper structural problems that lie beyond the learners’ capacity to solve them independently. Indeed, while the findings demonstrated that sentential contexts are beneficial and necessary for the precise interpretation of words with negative prefix rivalry, further findings also suggested that a more effective approach is to solve the problems at its source, that is, to fundamentally reform the instruction of English negative prefixation. These findings could reflect similar recurring problems in other L2 or even L1 contexts. Therefore, we sincerely hope that the practical implications of this study could serve as useful guidelines to develop instruction that prioritizes deep semantic engagement over rote memorization. While such an instructional shift requires a significant time investment, the long-term educational gains are substantial.

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Endnotes

¹ The present study followed Langacker (1987) in using an UPPERCASE form to represent the concept and a lowercase italic form to represent the word form.

² It must be noted that the authors did not totally agree with Hamawand's (2009) strong argument of rejecting total synonymy or interchangeability. Such cases could happen. For example, *unsatisfied* (which he argued to mean something is "not fulfilled", e.g., *unsatisfied wishes*) can refer to feelings of "not satisfied" like *dissatisfied*, as stated in major dictionaries. Corpus information (i.e., COCA) also showed a frequent cluster of *unsatisfied customers*—the counter-example Hamawand (2009) did not mention. However, Hamawand's (2009) strong claim is understandable considering that, in his context, the mainstream trend seemed to overlook the nuanced differences among fellow negative prefixes and between the word pairs. Despite these minor flaws, his pioneering attempt to systematically explain these overlooked topics remains valuable and largely convincing.

³ We did not ask any leading questions about tutoring. However, one of the researchers works as a tutor at a tutoring school and the participants were aware of this. Nevertheless, the researcher clearly emphasized at the beginning about the roles to perform during the interview (i.e., a researcher and participant).

⁴ In fact, this revealed negligence to the instruction, which emphasized that choosing both-correct answer would mean they think the word could mean *two* things (e.g., both NOT and REMOVE), not that thinking the two mean the *same* thing (i.e., what these interviewees did). However, it revealed something that can never be seen by merely looking at the scores. Without

these accounts, it would be impossible to see that there was, once again, a very strong association with NOT. Therefore, we decided not to filter these participants' data out.

⁵ Via personal communication since one of the researchers works as a tutor at a tutoring school.

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Appendix A

The target items in Task 1
(MRT–meaning recognition test)

1. **Unarmed**

- a) Weapons taken away from someone
- b) Not carrying any weapons since the beginning
- c) Both a) & b) are correct.

2. **Disarmed**

- a) Weapons taken away from someone
- b) Not carrying any weapons since the beginning
- c) Both a) & b) are correct.

3. **Unassociated**

- a) Not being associated with someone/something
- b) Association with someone/something being removed
- c) Both a. & b. are correct

4. **Dissociated**

- a) Not being associated with someone/something
- b) Association with someone/something being removed
- c) Both a. & b. are correct

5. **Unclaimed**

- a) Any claim of knowledge or responsibility being refused
- b) Not being claimed by the owner
- c) Both a) and b) are correct.

6. **Disclaimed**

- a) Any claim of knowledge or responsibility being refused
- b) Not being claimed by the owner
- c) Both a) and b) are correct.

7. **Unconnected**

- a) Not being connected
- b) Connection being removed
- c) Both a) and b) are correct.

8. **Disconnected**

- a) Not being connected
- b) Connection being removed
- c) Both a) and b) are correct.

9. **Uninfected**

- a) Infection being removed
- b) Not being infected
- c) Both a) and b) are correct.

10. **Disinfected**

- a) Infection being removed
- b) Not being infected
- c) Both a) and b) are correct.

11. Unproved

- a) Not being proved
- b) Something being proved to be wrong/false
- c) Both a) and b) are correct.

12. Disproved

- a) Not being proved
- b) Something being proved to be wrong/false
- c) Both a) and b) are correct.

13. Unqualified

- a) Qualifications to do something being removed, making the person no longer qualified
- b) Lacking qualifications to do something
- c) Both a) and b) are correct.

14. Disqualified

- a) Qualifications to do something being removed, making the person no longer qualified
- b) Lacking qualifications to do something
- c) Both a) and b) are correct.

15. Unused

- a) Not being used
- b) No longer being used (has been used but later abandoned)
- c) Both a) and b) are correct.

16. Disused

- a) Not being used
- b) No longer being used (has been used but later abandoned)
- c) Both a) and b) are correct.

Note.

This is not the order that appeared in the task (i.e., all the words in the task were randomized and mixed with distractors; the rival words were not placed one after the other.)

Appendix B

The target items in Task 2 (CMRT–context-based meaning recognition test)

1. The police used force against peaceful protestors, shooting **unarmed** people.
 - a) The people did not carry any weapons.
 - b) The police took the weapons away from the people.
 - c) Both a) & b) are correct.
2. Due to gun control, the entire population of this country became **disarmed** people, except for the military and police.
 - a) The people had no weapons before gun control.
 - b) The people had weapons before gun control, but weapons were taken away from them.
 - c) Both a) & b) are correct.
3. The network enabled **unassociated** groups to share information and coordinate activities.
 - a) Before the network, there used to be an association among the groups, but it was removed.
 - b) Before the network, there used to be no association among the groups.
 - c) Both a) & b) are correct.
4. After repressing painful memories, she was not able to retrieve them by merely thinking about them. Only when seeing reminders, sometimes those **dissociated** memories came back in pieces.
 - a) Her painful memories used to be associated with her mind, but the association was somehow removed.
 - b) Her painful memories were not associated with her mind.
 - c) Both a) & b) are correct.
5. A lost wallet was turned in to police and remained in an **unclaimed** property box.
 - a) The property had not yet been claimed for ownership by anyone.
 - b) People refused to claim ownership of the property.
 - c) Both a) & b) are correct.
6. The **disclaimed** responsibility of having pressed the button was expressed by the viewers who said, " I didn't know how to do that!".

- a) The responsibility of having pressed the button had not yet been claimed by anyone.
 - b) Viewers refused to claim responsibility for having pressed the button.
 - c) Both a) & b) are correct.
7. Indonesia aimed to improve its sea transportation facilities. Its railroads served only Java and three **unconnected** areas of Sumatra.
- a) The three Sumatra areas used to be connected, but the connection was removed.
 - b) The three Sumatra areas were not connected.
 - c) Both a) & b) are correct.
8. The cause of the **disconnected** phone line was non-payment of bills.
- a) The phone line used to be connected to the central system, but the connection was removed.
 - b) The phone line was not connected to the central system since the beginning.
 - c) Both a) & b) are correct.
9. Someone with influenza coughed, so the virus-containing droplets were inhaled by an **uninfected** person who stood close causing sickness.
- a) A person who stood close had no infection before inhaling the droplets.
 - b) A person who stood close used to be infected with the virus, but the infection was removed before inhaling the droplets.
 - c) Both a) & b) are correct.
10. The used materials were turned into **disinfected** materials, so they did not become home for the growth of bacteria.
- a) The materials had no infection before.
 - b) The materials used to be infected, but the infection was removed.
 - c) Both a) & b) are correct.
11. Nurses encouraged patients to be cautious in accepting any **unproved** claims that foot massage was a valid method for the treatment of bone diseases.
- a) The claims had been proved to be wrong.
 - b) The claims had not yet been proved.
 - c) Both a) & b) are correct.

12. The investigation revealed that each machine underwent careful testing, so the idea that machines were inaccurate was a **disproved** idea.
 - a) The idea that machines were inaccurate had been proved to be wrong.
 - b) The idea that machines were inaccurate had not yet been proved.
 - c) Both a) & b) are correct.

13. Because graduates from other fields eventually found their way into teaching, schools in Nigeria had many **unqualified** teachers.
 - a) The teachers lacked qualifications.
 - b) The teachers used to have qualifications, but their qualifications were removed due to some reasons, making them no longer qualified.
 - c) Both a) & b) are correct.

14. The **disqualified** election candidates were those found to have ties to illegal military groups.
 - a) The candidates lacked qualifications.
 - b) The candidates used to have qualifications, but their qualifications were removed due to some reasons, making them no longer qualified.
 - c) Both a) & b) are correct.

15. Georgia state bought a wonderful site to be developed for a big business project, but thirteen years later, it remained an **unused** site.
 - a) The site had been used, but it was no longer being used.
 - b) The site had not yet been used.
 - c) Both a) & b) are correct.

16. In 1991, Jennifer found the **disused** house which was built in the 1870s. She poured much of her free time and money into renovating it.
 - a) The house had been used, but it was no longer being used when Jennifer found it.
 - b) The house had not yet been used when Jennifer found it.
 - c) Both a) & b) are correct.

Note.

This is not the order that appeared in the task (i.e., all the words in the task were randomized and mixed with distractors; the rival words were not placed one after the other.)

Appendix C

Six main interview questions
(translated from Thai)

1. Have you ever realized or learned that words with prefix rivalry like *unarmed* and *disarmed* exist?
2. What do you think each prefix means?
3. (Inform the score from Task 1) After knowing your scores, what do you think caused you to choose these wrong answers (details asked based on each individual result)
4. How were your feelings different when doing Task 1 and Task 2?
5. (Inform the score from Task 2) After knowing your scores, what do you think caused you to choose these wrong answers (details asked based on each individual result)
6. Please recall your experiences in learning negative prefixes in your school.