Cooperative Corpus Consultation for Acquisition of Adjective + Preposition Collocations

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ABSTRACT

Teaching collocations through corpus consultation can highlight not only linguistic patterns but also association between meaning and patterns. However, previous studies have reported learners' problems during corpus consultation. Corpus consultation refers to learning activities in which a group of learners explore concordance lines in a corpus as to observe language patterns. It is assumed that the integration of group work into corpus consultation tends to facilitate the learning process. The study therefore investigated the effects of cooperative corpus consultation on the acquisition of L2 English adjective + preposition collocations. The participants were 74 first-year Thai undergraduate students divided into a control and an experimental group with 38 and 36 learners, respectively. The instruments were corpus-based materials and activities covering both paper-based and online activities, a pre-test and a post-test. While the control group consulted the corpus individually, the experimental group employed the cooperative corpus consultation approach before both groups took the post-test. The statistical results showed a significant difference in the pre-test and the post-test results of the experimental group, in both production and perception of the targeted collocations. The findings suggested that cooperative corpus consultation could promote discussion and cooperation in the experimental group, resulting in the acquisition of the adjective + preposition collocations.

Keywords: corpus consultation; cooperative learning; adjective + preposition collocations; acquisition; L1 Thai learners of English

INTRODUCTION

Despite the important role of collocations in the field of language learning, learning and acquiring collocations has been considered one of the problematic areas for learners (Bahns & Eldaw, 1993; Phoocharoensil, 2014). The study conducted by Nesselhauf (2003) even revealed that the participants had difficulties in mastering collocations despite their advanced level of language. Siyanova and Schmitt (2008) discovered that the problem was from the learners' underlying intuitions about collocations, and that the learners were not able to perceive common high-frequency collocations, so the learners tended to judge uncommon collocations as more common ones. Another important reason comes from the negative effects of the learners' first language (Bahns & Eldaw, 1993; Walker, 2011). A possible explanation is that collocation teaching has not been highlighted or has even been ignored. Bahns and Eldaw (1993) stated that poor collocation performance in class resulted from the neglect of collocation teaching, leading to a lack of learners' attention drawn to collocations.

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As a result, Bahns and Eldaw (1993) and Hill (2000) suggested that learners should receive collocation instruction, while Lewis (2000) proposed that teachers should train their students to notice collocations to raise collocational awareness. Like other researchers, Nesselhauf (2005) confirmed that learners needed collocation exposure, consciousness-raising activities, explicit teaching and collocation selection.

The mastery of collocations seems to cause Thai learners learning problems regardless of learners' language proficiency. Previous studies not only revealed various collocational errors produced by first language (L1) Thai learners (Mallikamas & Pongpairoj, 2005; Phoocharoensil, 2014), but also the causes of miscollocations as follows: interference from learners' first language, limited knowledge of collocations, the use of synonymy, learners' creative invention and the use of analogies. Another cause is transfer of training. In fact, when new words were introduced in class, their definitions and usage were presented (Mallikamas & Pongpairoj, 2005). However, Boonyasaquan (2009a, 2009b) stated that the role of grammar was more highlighted because teachers paid less attention to vocabulary as well as collocations.

Another interesting aspect about the collocation situation in Thailand is the imbalance of collocation research. More attention has been given to lexical collocations than to grammatical ones. However, the results from Phoocharoensil (2011) and Alotaibi, and Alotaibi (2015) showed that grammatical collocations, in particular those patterns containing prepositions, could be problematic due to L1 interference. After that, preposition omission, preposition insertion, and incorrect choice of prepositions could occur. This could be explained by the fact that L1 Thai learners struggle to master preposition usage and make a great number of errors involving prepositions (Pongpairoj, 2002; Watcharapunyawong & Usaha, 2013).

The grammatical collocational pattern, namely the pattern of adjective + preposition collocations, was focused on in this study for the following reasons. Firstly, this pattern can be problematic since one adjective can occur with more than one preposition without changing the meaning, such as "annoyed at", "annoyed about" and "annoyed by". What is more, some prepositional collocates do affect the meaning of some adjectives, for instance "tired of" and "tired from". Moreover, this pattern tends to be frequently found in both spoken and written texts. Lastly, very little attention of L1 Thai learners has been drawn to these possible problems. Corpus consultation could be of great help becaue it offers language exposure through authentic samples in the form of condancelines and opportunities to observe and explore language patterns reliably and statistically. Through corpus data, learners are able to confirm or reject a langueg hypothesis which might derive from L1 influence. This study investigated the effects of cooperative corpus consultation on the acquisition of adjective + preposition collocations among L1 Thai learners of English.

LITERATURE REVIEW

In this section, the literature review related to corpus, cooperative learning and cooperative corpus consultation is presented.

CORPUS AND CONCORDANCE

Since its first appearance in the 1960s, the computer corpus has penetrated all fields of language-related research and the use of the computer corpus has led to the development called 'corpus linguistics' (Granger, 1998). The term "corpus" has been defined by researchers similarly as "a collection of authentic language, either written or spoken, which has been compiled for a particular purpose" (Flowerdew, 2012, p. 3). The definitions from

the researchers in the field cover the following criteria: authenticity of the language, representation of the language, and explicit text-selection criteria. Therefore, the term "corpus" in this paper refers to a collection of authentic English language from both written and spoken texts collected for purposes of reference and usage as pedagogical materials.

One major approach addressed in corpus studies is Data Driven Learning (DDL) by Johns (1991). DDL is associated with inductive learning, where learners now take the role of researcher, computers and concordance lines act as informants, and teachers take the role of facilitator. Corpus consultation, one of the forms of DDL, refers to the learning process of using corpora and concordance lines as data and instruments to construct knowledge or to test previous hypotheses. This is done by selecting a search word, observing the search word and surrounding contexts in the concordance lines, interpreting and analyzing the data before creating patterns based on the observation. According to Johns (1997), there are three steps in DDL: Identify-Classify-Generalize. "Identification" refers to learners' ability to identify what language problems they want to investigate from corpus data. "Classification" means learners decide which category of patterns a particular language form represents. Lastly, "generalization" involves establishment of patterns and rule formulation on the basis of the data.

DDL can be an effective way to promote the acquisition of collocations. According to Hunston (2002), collocations can be observed informally but more reliably and statistically through corpus data. Teaching collocations through corpus data can highlight not only patterns but also associations between meaning and patterns. Also, the findings from the previous studies showed that DDL can be used to promote collocational learning. Koosha and Jafarpour (2006) reported the positive effects of data-driven learning on learning collocations of prepositions. Yoon (2008) found that corpus consultation could raise language awareness which is important for learning collocations. Liu (2010) stated that corpus-based cognitive analysis can promote not only better collocational understanding but also productive use of collocations, when compared to the noticing/memorization approach. Liu (2010) explained that there are too many collocations for learners to remember, therefore the cognitive process during corpus consultation tends to be more helpful. Furthermore, the process of corpus consultation can raise collocational awareness, which promotes better word retention.

COOPERATIVE LEARNING

"Cooperative learning" is defined by Slavin (1982) as an approach which involves group tasks wherein a group of four to six members of all levels of performance work together to achieve their goals or rewards. According to Slavin (1982), there are various things that take place when a group of people work together to achieve their goal. One thing is that team members express norms to provide support in doing, which could help their group to accomplish their goal. In classroom settings, the same thing is expected to happen. When working towards a group goal, learners begin telling one another what to do with regards to aspects such as doing school work, coming to class regularly and other important learning behaviors. Learners are then valued by peer groups.

Johnson, Johnson and Smith (2014) point out that there are five elements which are important for cooperative learning. The first one is positive interdependence. This means team members rely on each other, and one's success is not possible unless other members are successful. In other words, if one member fails to do their part, the rest of the team cannot succeed. Secondly, individual accountability refers to each learner doing their part for mastery of all of the material to be learned. Individual accountability may cover the following: allowing each member to test each other, having each learner explain what they have learned and lastly, observing each learner and recording the contributions of each

member. The third element is promotive interaction. While working together, learners support each other's success by aiding, supporting and providing verbal support. That could lead to cognitive processes such as problem solving, discussion of concepts, teaching each other, challenging each other's reasoning skills and connecting present and past learning. In addition, this could promote interpersonal skills such as supporting each other and encouraging efforts to learn. Next, appropriate use of cooperative skills is the condition in which group members develop and practice trust-building, leadership, decision-making, communication, and conflict-management skills. Finally, group processing refers to occasionally assessing their group's goal in order to maximize their own learning as well as other members' learning.

COOPERATIVE CORPUS CONSULTATION

The term "cooperative corpus consultation" is a combination of "cooperative learning" and "corpus consultation". It refers to data-driven learning activities where a group of L1 Thai learners consult a corpus to obtain concordance lines as their resources in order to observe adjective + preposition collocational patterns. In the next section, the reasons why cooperative corpus consultation was implemented in this study are explained.

Previous studies have shown potential drawbacks in using a corpus in language teaching. For example, Liu and Jiang (2009) reported these problems in in their study: sorting a large amount of data, the confusion from irrelevant examples, and a low level of motivation to use the corpus. In the Thai contexts, Sripicharn (2003) pointed out the concordance group students had very little exposure to inductive learning, which is vital in corpus consultation. Subsequent studies such as Gavioli and Aston (2001) and O'Sullivan (2007), proposed group work as an alternative way of carrying out corpus consultation. By creating a group community, cooperative learning provides the learners with exposure to corpus consultation and opportunities to work with their peers. As the group completes the tasks, they need to interact with one another in their group. Their interaction is important because it functions as peer scaffolding. According to Johnson et al. (2014) interaction and discussion during cooperative learning allow and encourage learners to construct conceptual understanding of what is being learnt, and provide feedback for one another as well as support.

Moreover, cooperative corpus consultation could provide the learners with opportunities to develop cognitive learning strategies as well as cooperative learning strategies that may lead them to construct their own language learning process. In fact, a large number of collocations cannot be taught in classroom settings. The learners need to develop their learning process to direct their own learning. As Johns (1991) stated, the use of corpus and concordance can influence the process of language learning, promoting enquiry and forming assumptions of learners, and aiding learners to develop the ability to see patterns of the target language in order to form generalizations for the patterns. During the corpus consultation process in the study, upon completing the tasks together, the target learners observed various cognitive skills such as comparing, differentiating as well as inferncing and social skills i.e.leadership and trust building from their peers. With the scaffolding from their peers and the teacher, this process will be gradually developed and could be used as a tool for their future collocation learning.

The hypothesis of the study was that cooperative corpus consultation has better effects on the acquisition of adjective + preposition collocations than corpus-based instruction.

METHODOLOGY

PARTICIPANTS

74 first year students from the Faculty of Humanities, Srinakharinwirote University participated in the study and they were divided into two groups: 38 students in a control group and 36 students in an experimental group. Both groups shared the following aspects: their first language, and their previous English exposure through the Thai educational system as well as their language proficiency (based on their English scores from the ONET (Ordinary National Educational Test).

The participants for the stimulated recall were chosen from the experimental group using purposive sampling. They were selected according to their scores on the pre-test: those with the highest scores, the lowest scores and the scores that were closest to the mean were chosen.

SELECTION OF ADJECTIVE + PREPOSITION COLLOCATIONS

The adjective + preposition collocations in this study were chosen based on the following criteria and steps. To begin with, the level of the tentative adjectives was checked according to the Common European Framework of Reference for Languages and only those adjectives whose levels range from A1 to B2 were chosen (see Appendix A). This was because the target participants were supposed to have reached B1 upon completing their secondary-level education. Then, the analysis of the prepositional collocates of the tentative adjectives was conducted. The analysis showed that the adjective + preposition collocations could be classified into two groups: those adjectives with restricted prepositions, such as "allergic to", and those with several prepositions, such as "careful with", "careful of" and "careful for". Adjectives with restricted prepositions refer to adjectives whose prepositional collocates were restricted. The latter group was later classified into two more groups: Group 1 collocations, which are collocations whose meaning does not alter despite the change of prepositions, and Group 2 collocations, are collocations whose meanings change according to the prepositional collocates. Secondly, the meaning of the target collocations was investigated to minimize the influence of the learners' first language. Therefore, any pair possibly receiving the effects of the mother tongue was taken out. The final step was to check each pair's frequency, hence, the number of concordance lines from the Brigham Young University (BYU) Corpus of Contemporary American English (COCA) was considered. The list of the target collocations was evaluated by three native teachers, resulting in an overall IOC score of 0.97 (The list of Group 1 and 2 collocations is in the appendix B).

TEACHING MATERIALS

TRAINING MATERIALS AND ACTIVITIES

Since the previous studies encountered the problems of corpus consultation, training and practice in corpus use was suggested (Tasanameelarp & Laohawiriyanon, 2010; Yoon & Hirvela, 2004; Yoon & Jo, 2014). There were two training sessions in the present study. Training Session 1 was to prepare the participants for collocation learning, while training Session 2 was aimed at corpus introduction as well as five corpus strategies.

CONCORDANCE-BASED TASKS

After the two sessions of corpus consultation training, both groups were exposed to the paper-based concordance tasks and the hands-on concordance-based tasks. The paper-based handouts were given before the other tasks since they provided both groups with a

manageable number of concordance lines. As suggested by Gilmore (2009) , teachers should facilitate the use of their materials by editing concordance lines to cope with the excessive amount of data. The validity of the tasks was checked by three experts in the fields of EFL teaching and classroom concordance by using the index of item-objective congruence (IOC). The mean score of the IOC was 0.92.

CORPUS

A free online corpus, the Brigham Young University (BYU) Corpus of Contemporary American English (COCA) was selected for this study due to its free online access, its variety of texts, and its large collections of collocations.

CORPUS STRATEGIES

In this study, the corpus strategies were developed based on Sun's cognitive skills (2003) and the five strategies are as follows. First, *observing strategy* refers to observing the words surrounding the keywords in terms of frequent occurrence and collocates. Second, *comparing strategy* means searching for similarities. Third, *differentiating strategy* is to identify different meanings or co-texts. Next, *grouping strategy* refers to classification of concordance lines. Finally, *generalizing strategy* is the process of generalizing collocation patterns from concordance lines.

COOPERATIVE STRATEGIES

Cooperative strategies are the strategies the learners employ in their group in order to complete the concordance-based tasks. Based on Johnson et al. (2014), there are five cooperative strategies that the learners could use during the cooperative corpus consultation. The strategies are grouped under the following five elements: positive interdependence, individual accountability, promotive interaction, use of social skills and group processing. The lecturer assigned the following roles to the participants in the experimental group, who worked in groups of four: facilitator, collocation recorder, strategy recorder and secretary. The roles were then voluntarily exchanged between the members of the group.

RESEARCH INSTRUMENTS

PRE-TEST AND POST-TEST

There were two parts to the test: a Grammaticality Judgment Task (GJT) and a Gap Filling Task (GFT) to measure collocational perception and production, respectively. The GJT contained a complete sentence with the adjective + preposition collocations as well as miscollocations, and the participants had to identify which sentences were correct and provide corrections for the incorrect sentences. The GJT was composed of 30 target items and 35 distracters. The test items were developed from five adjectives from Group 1 collocations and five adjectives from Group 2. Each adjective co-occurred with three prepositions (two target prepositions and one miscollocated preposition). The full score of the first part was 30 points. Containing 10 target items and 15 distracters, the GFT was based on both groups of adjectives. The five items based on G1 collocations were designed to have two correct answers, as can be seen from Item 6 below. The participants could choose the two correct answers, namely "at" and "by".

6. Parents are genuinely shocked _____ the widespread use of alcohol and drugs in school zones.

A. at B. to C. by D. of

The five items from G2 contained one correct answer. As a result, the total number of marks is 15 points. The test was then verified for its content validity using the Index of Item-objective Congruence (IOC) by three native English teachers. The mean IOC scores of the GJT and GFT was 0.98 and 0.93, respectively, leading to an overall IOC score of 0.95.

STIMULATED RECALL INTERVIEW

The stimulated recall interview was conducted to investigate the participants' thinking process during the cooperative corpus consultation. The participants were prompted using the results from the classroom observation schemes and the cooperative concordance-based tasks. The six participants retrospectively verbalized their corpus and cooperative strategies as well as the effects of the treatment. The verbal reports were audio-recorded and transcribed before they are analyzed using content analysis method.

DATA COLLECTION AND DATA ANALYSIS

The study began with two training sessions to prepare the participants for the corpus consultation process. In addition, the pre-test was given to examine the participants' level of perception and production of acquisition of adjective + preposition collocations. After that, the experimental group was formed in which they completed the concordance tasks with their peers, while the control group performed the corpus consultation individually. As mentioned earlier, both groups received the paper-based concordance handouts from week 3 to week 7, followed by the hands-on concordance-based tasks for the last five weeks. After ten learning sessions, both groups took the post-test. In terms of data analysis, the scores from the pre-test and post-test were analyzed for mean scores and standard deviations. The mean scores within each group were compared using a paired-sample *t*-test while the comparison of the mean scores between the two groups was performed using an independent sample *t*-test. In terms of the data collection of the stimulated recall interview, the process started with two sessions of training in week 3 and 4, so that the six participants understood the process. From week 5 onwards, they were asked to retrospectively talk about the process of the cooperative corpus consultation. The verbal reports from the stimulated recall protocol were qualitatively analyzed using content analysis.

RESULTS/DISCUSSION

The overall mean scores of each group, on both tasks, are presented in Table 1.

TABLE 1. Mean pre-test scores of GJT and GFT

	Control Group	%	Experimental Group	%	Sig (2 tailed)
GJT (full score= 30)	16.26	54.2	16.08	53.6	0.82
GFT (full score= 15)	4.79	31.93	4.53	30.2	0.55

* $p<0.05$

As can be seen from Table 1, the mean GJT and GFT scores of the control group were 16.26 of out 30 marks (54.2%) and 4.79 out of 15 marks (31.93%), respectively. Likewise, the mean GJT and GFT scores of the experimental group were 16.08 (53.6%) and 4.53 (30.2%), respectively. After the mean scores had been calculated, an independent-samples t-test was conducted to compare the average scores of both groups; there was no significant difference in the pre-test scores of both groups ($p = 0.82$ and $p = 0.55$, respectively), as can be seen in Table 1. It could be said that both groups nearly performed equally.

A detailed analysis of the pre-test of both groups found top five challenging collocations which the participants had difficulties with, as shown in Table 2.

TABLE 2. Top five problematic collocations of the pre-test

	Control Group (38 participants)				Experimental Group (36 participants)			
Collocations	**GJT**	**%**	**GFT**	**%**	**GJT**	**%**	**GFT**	**%**
Group 1	upset in	92.1	puzzled at	89.47	upset in	88.8	puzzled at	94.44
	furious with	89.47	excited by	86.84	furious with	80.5	slow at	91.66
	disappointed in	78.94	annoyed at	81.57	disappointed in	77.7	annoyed by	86.11
	amazed in	71.05	slow at	81.57			excited by	86.11
			shocked at	78.94			shocked at	83.33
							slow in	69.44
Group 2	wrong at	89.47	immune to	76.31	wrong at	94.44		
	free to	73.68			free for	91.66		
					punished at	80.5		
					punished with	77.77		

Generally, both groups had similar collocational problems and the collocations of GJT tasks were more problematic. To be precise, eight pairs of the collocations were found to be problematic in the analysis of both groups, namely: "upset in", "furious with", "disappointed in", "wrong at", "puzzled at", "slow at", "excited at" and "shocked at". Upon completing the GJT tasks, the participants from both groups perceived some miscollocations as more acceptable, such as "upset in", "furious with", "disappointed in", and "wrong at". A similar trend could be found in choosing the prepositional collocates in the GFT, such as with "puzzled at", "excited by", "shocked at" and "slow at". It is interesting to note that five items of the GFT can have two possible correct answers, yet only one participant from each group could score two points from providing two correct answers.

Table 3 shows the overall mean scores of the post-test of both groups compared to those of the pre-test as well as the difference between the control group and the experimental group.

TABLE 3. The comparison of the post-test and the pre-test within and between the control group and the experimental group

	Control Group				Experimental Group				Between groups
	Pre	%	Post	%	Pre	%	Post	%	Sig (2 tailed)
GJT (full score= 30)	16.26	54.2	16.03	54.1	16.08	53.6	19.44	64.8	p = 0.000
Intra group			0.794				p = 0.000		
GFT (full score= 15)	4.79	31.93	5.86	39.06	4.53	30.2	8.03	53.53	p = 0.000
Intra group			p = 0.011				p = 0.000		

* $p<0.05$

In general, the participants in the experimental group outdid those in the control group in both tasks. The comparison of the GJT and GFT between the pre-test and the post-test revealed that the control group performed better in the GFT only, where the mean score rose from 31.93% to 39.06%, whereas the GJT score remained unchanged. A paired samples t-test was conducted to compare the mean GJT and GFT scores between the pre-test and the post-test for the control group. The statistical data revealed that there was no significant difference in the scores of the GJT (p = 0.794) but there was a substantial difference in those of the GFT (p = 0.011). It could be said that the traditional corpus consultation led to an improvement on the target collocation in the production tasks of the control group. However, the traditional corpus approach had no positive effect on the target colloctoions in the

perception tasks. Unlike the control group, the experimental group performed far better in both the GJT and GFT, increasing their scores from 53.6% to 64.8% and from 30.2% to 53.53%, respectively. The comparison of the GJT and GFT scores between the pre-test and the post-test of the experimental group was also made using a paired samples t-test which showed a significant difference in both the GJT and GFT (p = 0.000). The mean scores of both groups were then compared using an independent-samples t-test, showing a significant difference (p = 0.000). It can be drawn that the cooperative corpus consultation was more effective because it could promote both perception and production tasks. Moreover, the examination of the answers from the GFT showed that the number of times the control group participants chose both correct answers in the items with two answers increased from one to five, while the corresponding number among experimental group participants significantly increased from once in the pre-test to 32 times in the post-test.

The data from Table 4 illustrates that after the corpus consultation, both groups had fewer problematic collocational pairs, and that five pairs of the collocations – "furious with, wrong at, slow at, slow in and wrong at" – caused both groups similar problems.

TABLE 4. Top five problematic collocations of the post-test

	Control Group (38 participants)				Experimental Group (36 participants)			
Collocations	**GJT**	**%**	**GFT**	**%**	**GJT**	**%**	**GFT**	**%**
Group 1	furious with	89.47	slow at	81.57	furious with	80.5	slow in	88.8
	surprised in	76.31	slow in	78.94	disappointed in	72.22	excited by	69.44
			shocked at	76.31	upset in	63.88	slow at	69.44
Group 2	wrong at	94.73			wrong at	88.8		
	free for	89.47			free for	72.22		
	frightened in	81.57						

Figure 1 shows the factors affect the acquisition of collocations derived from the verbal reports.

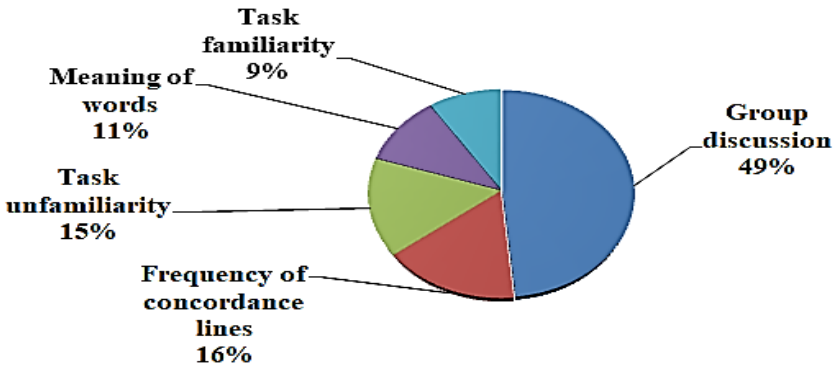

FIGURE 1. Verbal protocol data showing factors affecting the acquisition of the collocations

The analysis of the verbal reports, conducted with the six learners from the experimental group during the stimulated recall, indicated five factors influencing the acquisitions of the target collocations: the group discussion, the frequency of the concordance lines, task unfamiliarity, task familiarity and meanings of words. The group discussion referred to oral support occurring in a cooperative learning group ranging from brainstorm, discussion, request for reasons or conclusions to suggested solutions. Secondly, the frequency of the concordance lines was the number of the samples the learners used as a criterion for grouping or generalizing a collocation pattern. The task unfamiliarity showed that the

learners were not used to the tasks requiring inductive learning skills whereas the task familiarity referred to the task comprehension. Lastly, meanings of words in this study referred to definitions of nouns found in the concordance lines in both paper-based handouts and hands-on concordance based tasks. The three factors which seemed to have had a positive influence on the process of cooperative corpus consultation were the group discussion, the frequency of the concordance lines and the task familiarity, while the other two, namely the task unfamiliarity and the meanings of words found in the concordance lines, relatively impeded the process.

The present study set out to assess the effects of the cooperative corpus consultation on learning adjective + preposition collocations. At the beginning of the project, the participants hardly had any experience in corpus consultation. Besides, the analysis of the pre-test revealed the collocational deviations from the negative influence of their L1, in that the two groups judged the use of the preposition "in" as the acceptable preposition for "upset", "disappointed" and "amazed" as seen in the following examples.

> *Sarah was **amazed in** the morning news about an armless airplane pilot.*
> *Someone stole my bag. I was **upset in** leaving my smartphone which was inside the bag.*

In fact, the use of "in" is not acceptable in the given contexts. The possible causes of this usage come from the effect of transfer of training and the transfer of their L1. In fact, the majority of L1 Thai learners have English exposure through in-class learning and tutoring schools. While the latter tends to focus on memorizing words for examination preparation, the former may not pay enough attention to collocational awareness, needless to say the variety of adjective + preposition collocations. Moreover, teaching materials tend not to highlight the use of this pattern. As a result, the participants resorted to their first language when taking the pre-test. The use of the preposition "in" in the examples above, when literally translated into Thai, can be understood by the majority of the participants. The findings are consistent with those of Phoocharoensil (2011, 2014). After the treatment, both groups showed improvement in their collocation perception. In fact, more participants from both groups were aware of the uncommon use of the preposition "in", leading to the higher number of participants who judged "upset in"," disappointed in", and "amazed in" as unacceptable collocations. Despite the potential negative influence of the participants' L1 on collocation perception, their verbal report indicated that the participants used their first language as a facilitative factor in the process of corpus consultation such as writing the definitions of the unknown words in Thai and discussing them with their group members in Thai.

The findings confirm the hypothesis that the cooperative corpus consultation has positive effects on producing the target collocations since there was a significant improvement of the experimental group's scores from the pre-test to the post-test. The findings are in line with those of Cho (2016) in that the participants in the individual group were outperformed by those in the collaborative group, especially in the conceptual task where they collaboratively constructed the data analysis to reach comprehensive interpretations of corpus data. According to Johnson et al. (2014), cooperative learning stimulates intercommunication and consultation where learners create conceptual understanding and provide feedback for each other. As frequently mentioned in the stimulated verbal protocol, the group discussion helped the participants in the experimental group share their linguistic findings, justify their answers and provide feedback, as can be seen from the following excerpts.

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(1) "*For example, when working on the adjective "Grateful", I was confused that which prepositions could be used with people. When Pond (his teammate) pointed out that "Grateful + to" collocate frequently with the nouns referring to people and he showed me the examples from the concordance lines, I understood clearly.* (ST6)
(2) "*I compared with my friends" and "I asked my friends how to observe and asked them to give their justification".* (ST3)

However, the results of this study are different from those of Cho (2016) in that there was a problem regarding power inequality between group members in Cho's study. The possible reason why power inequality was not observed in this particular study is that the second element of cooperative learning, individual accountability, requires each member to take responsibility for their part and explain what they achieve from their learning. As a result, the participants in the cooperative group in this study took different assigned roles each week, ranging from a facilitator, secretary, or collocation recorder to a strategy recorder. Each of the members had the opportunity to try each role, hence, the members of each team hardly encountered the dominant control of their team members. Moreover, the verbal report from one group revealed the balance between individuality and cooperative learning, since after receiving the task, each team member spent time consulting corpus individually before starting the group discussion, as can be seen from the excerpts below.

(3) "*At first, we separately worked on the task. We tried to understand the data on our own. After that, we started discussion. Mostly, we preferred this way".* (ST3)
(4) "W*e silently work on our own before sharing what we find".* (ST5)

The verbal protocol report received from the six participants also supports what Granger (2011) suggests, in that there are three study areas for learners to analyze, namely frequency, variations and co-texts. The participants from the experimental group, during corpus consulting, observed the data frequency in terms of prepositional variations and the subsequent nouns.

(5) "*At first, I circled the prepositions following the adjective to see what prepositions can follow and then wrote them down separately to see the most frequently used prepositions. I found "by, for, at and to" are the most frequent collocates. Then I looked at the following nouns like abstract nouns, concrete nouns or object pronouns".* (ST1)
(6) *" I looked the following nouns after the prepositions and I observed the similar meaning. I found the following words frequently (facts, questions, presence and lack).* (ST4)

In fact, the difference of the preposition variations between the two groups could be seen from the number of participants providing two correct answers in relevant items of the GFT. As mentioned earlier, there were 32 times where the experimental group participants were more aware of prepositional variations and successfully chose two correct prepositions in the GFT. Partly, it could be because the participants understood the linguistic character of the adjective + preposition collocations through the observation of frequency of corpus data and their group discussion. Moreover, when analyzing the subsequent nouns from the concordance lines, the participants could generalize the patterns and they came up with their linguistic hypothesis.

(7) *"I thought "punished" was easily observed. Since "punished with" occurred with nouns referring to punishments only while "punished for" indicting the reasons why the people got punishments".* (ST6)

(8) "*When the adjective "frightened" means showing fear, it follows the following prepositions "to, of, with". "When it means showing concern, it seems to have the preposition "for" only.* (ST1)

Apart from the significant improvement of the experimental group, the score comparison of the control group revealed a noticeable development, especially in the GFT. Possible explanations are as follows. Unlike other traditional corpus studies, the control group participants received a training session and paper-based handouts to work on during the first five weeks. In fact, the paper-based handouts facilitated the individual corpus process. Working on sufficient and manageable input in the form of the concordance lines, could help the control group to practice using cognitive skills such as observing, noticing, comparing, and differentiating. Secondly, being exposed to the concordance lines and the paper-based handouts could raise their collocational awareness and knowledge of prepositional variations. However, when moving to the stage of the hands-on concordance-based tasks during the last five weeks, the control-group learners showed some confusion due to various problems: the unfamiliarity with COCA, the large number of concordance lines and some technological problems. In fact, the process of corpus consultation involves various cognitive skills, listed by O'Sullivan (2007) as follows: predicting, observing, noticing, thinking, reasoning, analyzing, interpreting, reflecting, exploring, making inferences (inductively or deductively), focusing, guessing, comparing, differentiating, theorizing, hypothesizing, and verifying. As Sripicharn (2003) noticed, due to different learning cultures, the Thai participants in his study had problems with inductive learning approach which was necessary for corpus consultation. Likewise, handling a new learning approach and mastering necessary cognitive skills in completing the hands-on concordance-based tasks caused some confusion and uncertainty within the control group. On the contrary, the experimental group could exchange their findings and healthily discuss them, justify their opinions with the evidence from the concordance lines, observe each other's learning strategies, and solve their team problems together. It is worth observing that the experimental group co-constructed the linguistic knowledge and co-developed the cognitive skills during the cooperative corpus consultation, leading to the significant improvement in both given tasks.

CONCLUSION

This study provided an examination of the effects of the cooperative corpus consultation on the acquisition of adjective + preposition collocations. Two groups of L1 Thai learners (control and experimental group) participated in this study. The results of the study revealed significantly positive effects of the cooperative corpus consultation on the experimental group's performance. The focused group not only performed better in the post-test but also revealed the development of the process of language learning through the cooperative corpus consultation such as linguistic analysis, frequency observation, and observation of prepositional variations as well as co-texts of the adjective + preposition collocations.

What should be observed in this study is that corpus consultation alone might not yield promising benefits without teachers' support planning. With the provision of corpus training, edited corpus materials and more importantly, cooperative strategies, cooperative corpus consultation has positive effects on collocation instruction and this learning method could be employed with other groups of learners. However, the findings of this study have some limitations. Since the period of the experiment lasted for a semester, to have a clearer picture of the role of cooperative corpus consultation in assisting learners to learn collocations, a long-term study with a similar experimental design could be conducted. Based

on the findings of this study, future studies could employ an investigation into other types of grammatical collocations or lexical collocations. Moreover, future studies might be more effective and engaging if teachers could provide various tasks in learning collocations, where learners can freely select an interesting target word, perform a corpus consultation and present their findings for the class, thus, promoting a meaningful learning process for learners.

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APPENDIX A

Proficient User	**C2**	Can understand with ease virtually everything heard or read. Can summarise information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express him/herself spontaneously, very fluently and precisely, differentiating finer shades of meaning even in more complex situations.
	C1	Can understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express him/herself fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organisational patterns, connectors and cohesive devices.
Independent User	**B2**	Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.
	B1	Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics, which are familiar, or of personal interest. Can describe experiences and events, dreams, hopes & ambitions and briefly give reasons and explanations for opinions and plans.
Basic User	**A2**	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.
	A1	Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

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APPENDIX B

Group 1 collocations: a combination of adjective+ preposition collocations whose meaning will not change regardless the different prepositional collocate.

Adjectives	More frequent collocational prep	The number of concordance lines from COCA	Less frequent collocational prep	The number of concordance lines from COCA
annoyed	by	327	at	274
amazed	at	1172	by	518
disappointed	by	558	at	186
excited	by	741	at	141
furious	at	383	over	61
puzzled	by	462	at	65
surprised	by	3118	at	2280
shocked	by	1167	at	630
slow	in	432	at	114
upset	by	673	over	228

Group 2 collocations: a combination of adjective+ preposition collocations whose meanings vary according to the prepositional collocates.

Adjectives	More frequent collocational prep	The number of concordance lines from COCA	Less frequent collocational prep	The number of concordance lines from COCA
clear	of	57	on	5
free	to	1696	from	972
frightened	of	440	for	28
generous	with	330	of	112
grateful	for	2689	to	2358
good	to	16592	with	1483
immune	to	1384	from	503
punished	for	711	with	70
sick	of	2339	at	225
wrong	with	1664	for	172

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