Structural Priming and the Acquisition of English Dative

Constructions by L1 Thai Learners

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A Thesis Submitted in Partial Fulfillment of the Requirements

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การเตรียมรับรู้ทางโครงสร้างและการรับหน่วยสร้างผู้รับสภาพในภาษาอังกฤษโดยผู้เรียนที่มี

ภาษาไทยเป็นภาษาที่หนึ่ง

นายจตุรพร คงบาง

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วัตถุประสงค์ของงานวิจัยคือ ศึกษาว่าการเตรียมการรับรู้ทางโครงสร้าง (structural priming) สามารถอำนวยความ
สะดวกในการรับหน่วยสร้างผู้รับสภาพแบบกรรมคู่ (double-object construction) และหน่วยสร้างผู้รับสภาพกรรมคู่แบบบุพ
บท (prepositional dative construction) ในภาษาอังกฤษได้หรือไม่ และ เพื่อศึกษาว่าเงื่อนไขแต่ละประเภทของการ
เตรียมการรับรู้ทางโครงสร้างมีผลการเรียนรู้ที่แตกต่างกันในการรับหน่วยสร้างผู้รับสภาพในภาษาอังกฤษของผู้เรียนที่มีภาษาไทยเป็นภาษาที่
หนึ่งหรือไม่ สมมติฐานแรกของงานวิจัยนี้คือ ผู้เรียนที่มีภาษาไทยเป็นภาษาที่หนึ่งจะใช้หน่วยสร้างดังกล่าวในจำนวนที่มากขึ้นหลังจาก
ได้รับการทดลองการเตรียมการรับรู้ทางโครงสร้าง โดยหน่วยสร้างผู้รับสภาพกรรมคู่แบบบุพบทซึ่งมีลักษณะทางโครงสร้างคล้ายกับหน่วย
สร้างเทียบเคียงในภาษาที่หนึ่งจะถูกใช้ในจำนวนที่มากกว่าหน่วยสร้างผู้รับสภาพแบบกรรมคู่ซึ่งมีลักษณะทางโครงสร้างแตกต่างจากหน่วย
สร้างเทียบเคียงในภาษาที่หนึ่ง สมมติฐานที่สองคือ เงื่อนไขแต่ละประเภทของการเตรียมการรับรู้ทางโครงสร้างมีผลการเรียนรู้ที่แตกต่างกัน
ในการรับหน่วยสร้างผู้รับสภาพในภาษาอังกฤษของผู้เรียนที่มีภาษาไทยเป็นภาษาที่หนึ่ง โดยเงื่อนไขที่มีประโยคแทรกจำนวนมากจะส่งผล
ต่อการเรียนรู้ในระยะยาว ส่วนเงื่อนไขที่มีประโยคแทรกจำนวนน้อยจะส่งผลต่อการเรียนรู้ในระยะสั้นต่อการรับหน่วยสร้างดังกล่าว
งานวิจัยนี้มีผู้เข้าร่วมวิจัยทั้งหมด 90 คน โดยทั้งหมดเป็นผู้เรียนที่มีสมิทธิภาพภาษาอังกฤษในระดับกลาง แบ่งเป็นผู้เรียนกลุ่ม long-lag
จำนวน 30 คน ผู้เรียนกลุ่ม short-lag จำนวน 30 คน และ ผู้เรียนกลุ่ม no-lag จำนวน 30 คน เครื่องมือวิจัยประกอบด้วย
แบบทดสอบความเข้าใจโครงสร้างประโยคภาษาอังกฤษ (Comprehension Checking Task) แบบทดสอบการเลือกใช้
โครงสร้างภาษาอังกฤษ (Preference Assessment Task) การทดสอบการเตรียมการรับรู้ทางโครงสร้าง (Priming
Task) และการทดสอบบรรยายภาพหลังการทดลองทันที (Immediate Post-Picture Description Task)

ผลงานวิจัยพบว่าผู้เรียนทั้งสามกลุ่มใช้หน่วยสร้างผู้รับสภาพในภาษาอังกฤษเพิ่มขึ้นอย่างมีนัยสำคัญที่ระดับ .05หลังจาก
ได้รับการทดลองการเตรียมการรับรู้ทางโครงสร้าง ซึ่งเป็นไปตามสมมติฐานในข้อที่หนึ่ง อย่างไรก็ตาม เงื่อนไขแต่ละประเภทของการ
เตรียมการรับรู้ทางโครงสร้างไม่มีผลการเรียนรู้ที่แตกต่างกันในการรับหน่วยสร้างผู้รับสภาพในภาษาอังกฤษของผู้เรียนเนื่องจากผู้เรียนทุก
กลุ่มใช้หน่วยสร้างผู้รับสภาพในภาษาอังกฤษได้อย่างถูกต้องในระดับสูงในระดับที่ใกล้เคียงกัน ซึ่งไม่เป็นไปตามสมมติฐานในข้อที่สอง ผล
วิจัยยังชี้ให้เห็นว่าการเตรียมการรับรู้ทางโครงสร้างเป็นกระบวนการเรียนรู้แบบอัตโนมัติ (Implicit learning process) (Bock
& Griffin, 2000) รูปแบบหนึ่ง ผลการวิจัยมีประโยชน์สำคัญในด้านการรับภาษาที่สองที่เกี่ยวกับการเตรียมการรับรู้ทางโครงสร้าง
และนำไปสู่นัยทางด้านการเรียนการสอนภาษา

สาขาวิชา	ภาษาอังกฤษ	ลายมือชื่อนิสิต ....
ปีการศึกษา	2564	ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

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The purpose of the present study is to examine whether structural priming can facilitate L1 Thai learners' acquisition of English dative constructions, both English DO construction and English PO construction and to investigate whether different priming conditions have different learning effects on L1 Thai learners' acquisition of English dative constructions. The first hypothesis states that the L1 Thai learners produce English dative constructions, both DO construction and PO construction, at higher rates after receiving the structural priming experiments. However, the similar structure, i.e. the English PO construction is used more frequently than the different structure, i.e. the English DO construction. The second hypothesis states that different priming conditions have different learning effects on L1 Thai learners' acquisition of English dative constructions. That is, less intervening sentences between prime and target sentences contribute to the short-term learning effects, whereas more intervening sentences between prime and target sentences mediate the long-term learning effects on L1 Thai learners' acquisition of English dative constructions. The participants were 90 Thai intermediate learners of English randomly divided into three different priming conditions groups: long-lag priming group (n=30), short-lag priming group (n=30) and no-lag priming group (n=30). Data were collected from a comprehension checking task, a preference assessment task, a priming task and an immediate post-priming picture description task.

Results showed that the L1 Thai learners of English showed a significant increase in their productions of English dative constructions after receiving the structural priming experiments, suggesting that the learners acquired the English dative constructions more effectively through structure priming. Thus, the first hypothesis was confirmed by the results. Moreover, the structural priming effects were found to persist over time, suggesting that structural priming can promote long-term production of the English dative constructions among the learners. However, different priming conditions did not have different learning effects because the learners across the three priming condition groups showed similar production rates of dative sentences. Thus, the second hypothesis was not confirmed by the results. Moreover, it was assumed that structural priming was a form of implicit learning process (Bock & Griffin, 2000). The findings of the study contributed to SLA with respect to structural priming and led to some pedagogical implications.

| Field of Study: | English | Student's Signature .... |
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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Grammar or the syntactic structure has been among the most problematic areas in Second Language Acquisition (SLA) (e.g., Abbasi & Karimnia, 2011; Berent, 1985; Brown, 2014; DeKeyser & Sokalski, 1996; Ellis, 2008; Sattayatham & Honsa, 2007; Scheffler, 2009). Specifically, the dative construction appears to be one that represents the greatest challenge for second language (L2) learners (e.g., Jiang, 2009; Kang, 2011; Larson, 1988; Pongyoo, 2017; Shin, 2008).

The dative construction is a syntactic structure consisting of a dative verb, a verb that requires two objects: a direct and an indirect object e.g., 'give', 'send', 'hand', etc. Specifically, a dative sentence is said to have three arguments: an agent argument (A) — a person who gives something, a recipient argument (R) — a person who receives something and a theme argument (T) — a thing which is transferred from agent to recipient. Nevertheless, different languages have different argument structures of dative construction (Wolf-Quintero, 1992). For instance, Korean allows free word order for dative constructions. Structures like 'John gave a book to Peter,' 'John gave to Peter a book,' 'John gave Peter a book,' and 'John gave a book Peter' are all possible in Korean (Kang, 2011). In English, there exist two types of dative construction, i.e. the Double-Object Dative Construction (DO) and the Prepositional Dative Construction (PO), as in (1a-b) and (2b).

(1)   a. [**Alice**] ᴀɢᴇɴᴛ gave [**a book**] ᴛʜᴇᴍᴇ [**to John**] ʀᴇᴄɪᴘɪᴇɴᴛ.

          b. [**Alice**] ᴀɢᴇɴᴛ bought [**a book**] ᴛʜᴇᴍᴇ [**for John**] ʙᴇɴᴇꜰɪᴄɪᴀʀʏ.

(2)   a. [**Alice**] ᴀɢᴇɴᴛ gave [**John**] ʀᴇᴄɪᴘɪᴇɴᴛ [**a book**] ᴛʜᴇᴍᴇ.

Adapted from Iwasaki and Ingkaphirom (2005, p. 113)

Specifically, the constructional schema for English dative construction can be represented as [Agent – Dative Verb – Recipient –Theme] or [Agent –Dative Verb – Theme – to/for Recipient]. In (1a-b), the direct object 'a book' — the T-argument precedes the prepositional phrase 'to / for John' — the R-argument. Sentence (1a-b) is called Prepositional Dative Construction (PO). In (2a), the indirect object 'John' — the R-argument precedes the direct object 'a book' — a T-argument. This sentence is called Double-Object Dative Construction (DO). Research has shown that the DO construction is highly problematic for L2 learners from a variety of L1 backgrounds because they encounter the difficulty in learning the argument structures of dative constructions (e.g., Chang, 2004; Hamdan, 1994; Jiang & Huang, 2015; Pongyoo, 2017; Whong-Barr & Schwartz, 2002).

This problem also occurs among L1 Thai learners of English (Pongyoo, 2017), perhaps owing to cross-linguistic differences between English and Thai. In Thai, the dative construction can be used to express one semantically related event in two syntactic constructions like English, but it differs from those of English in terms of order of arguments in the DO construction.

(3) a. *rûŋ náʔ pha: hâj   nǎŋsǔɰ   **kɛ̀ɛ / dɛ̀ɛ**   sùʔ ma: li:*

       Rungnapha   give   book   to   Sumalee

       'Rungnapha gave a book to Sumalee.'

(4) a. *rûŋ náʔ pha: hâj   **nǎŋsǔɰ   sùʔ ma: li:***

       Rungnapha   give   book   Sumalee

       'Rungnapha gave a book to Sumalee.'

              Adapted from Iwasaki and Ingkaphirom (2005, p. 113)

The constructional schema for Thai dative construction can be represented as [Agent – Dative Verb – Theme – Recipient] or [Agent – Dative Verb – Theme – kɛ̀ɛ / dɛ̀ɛ Recipient]. In (3a), the direct object nǎŋsǔɰ 'a book'— the T-argument precedes the prepositional phrase kɛ̀ɛ/ dɛ̀ɛ Sumalee — an R-argument, which is similar to the English prepositional dative construction (PO). In (4a), the direct object nǎŋsǔɰ 'a book' — the T-argument precedes the indirect object 'Sumalee' — an R-argument, which is different from English in terms of order of arguments. This sentence is called the Double-Object Dative Construction (DO). As a result of this difference, L1 Thai learners of English possibly would have difficulty in acquiring the English DO construction.

In the field of SLA, the issue of whether repetition and imitation can promote L2 acquisition is still subject to debate. Research has revealed a kind of repetition called 'structural priming' (e.g., Bock, 1986; Bock & Griffin, 2000). Specifically, the term 'structural priming' (also termed 'syntactic priming' and 'structural persistence') refers to a tendency of learners to reuse a recently produced and heard structure in the

subsequent utterances (Bock, 1986; Branigan, 2007). For instance, if learners have heard and produced a PO sentence (e.g., 'the man is giving a book to the girl.'), they will be more likely to produce another PO sentence (e.g., 'the girl is sending a gift to her father.') in a subsequent utterance. Structural priming has been first discussed in the L1 literature (e.g., Bock, 1986; Bock & Griffin, 2000; Pickering & Branigan, 1998; Saffran & Martin, 1997). These studies investigated structural priming as an underlying mechanism in language production, comprehension and processing. Recent research on structural priming has focused on whether it can promote L2 acquisition (e.g., Ameri-Golestan, 2012; Jiang & Huang, 2015; McDonough, 2006; McDonough & Mackey, 2008; Shin & Christianson, 2012). These studies examined the structural priming effects on the acquisition of various English syntactic structures by L2 learners with different L1 backgrounds such as passives structures by L1 Korean learners, (Kim & McDonough, 2008), dative structures by L1 Chinese learners (Jiang & Huang, 2015; Shin & Christianson, 2012), indirect questions/request by L1 Persian learners (Ameri-Golestan, 2010) and separated-phrasal verb structures by L1 Korean learners (Shin & Christianson, 2012).

In the Thai context, to the best of my knowledge, there has been only one study using a structural priming paradigm to investigate the English ESL question development among L1 Thai learners (McDonough & Mackey, 2008). Specifically, there is an apparent lack of studies which examine the acquisition of English dative constructions by L1 Thai learners using a structural priming methodological paradigm. The current study will examine this issue.

1.2 Research Questions

1) To what extent can structural priming facilitate L1 Thai learners' acquisition of English dative constructions, both the DO construction and the PO construction?

2) How do different priming conditions have different learning effects on L1 Thai learners' acquisition of English dative constructions?

1.3 Research objectives

1) To investigate whether structural priming can facilitate L1 Thai learners' acquisition of English dative constructions, both the DO construction and the PO construction.

2) To investigate whether different priming conditions have different learning effects on L1 Thai learners' acquisition of English dative constructions.

1.4 Statement of hypotheses

The formulated hypotheses were as follows:

1) L1 Thai learners produce English dative constructions — both the DO construction and the PO construction — at higher rates after the structural priming experiments. Nevertheless, the similar structure, i.e. English PO construction is likely to be used more frequently than the different structure, i.e. English DO construction.

2) Different priming conditions have different learning effects on L1 Thai learners' acquisition of English dative constructions. Nevertheless, less intervening sentences between prime and target sentences contribute to the

short-term learning effects, whereas more intervening sentences between prime and target sentences mediate the long-term learning effects on L1 Thai learners' acquisition of English dative constructions.

1.5 Significance of the study

The present study was significant for the following reasons:

1) The findings of the study contribute to SLA with respect to the effects of structural priming on the acquisition of English dative constructions by L1 Thai learners of English.

2) The findings of the study benefit the English language teaching for L1 Thai learners of English.

The current study will proceed as follows. Chapter 2 presents literature review of the study. Chapter 3 details the methodology of the study. Chapter 4 reports and discusses the results. Chapter 5 provides a conclusion of the study, pedagogical implications, limitations, and recommendation for future research.

CHAPTER 2

REVIEW OF LITERATURE

This chapter reviews related theories and previous studies. Section 2.1 discusses the Structural Priming Theory. Section 2.2 presents language transfer and markedness theory. Section 2.3 presents dative constructions in both English and Thai .Section 2.4 reviews previous research studies on the acquisition of L2 English dative constructions. 2.5 reviews previous research studies related to structural priming in second language acquisition. 2.6 presents the conclusion of the chapter.

2.1. Structural Priming Theory

This section discusses structural priming theory, its factors and its three mechanistic accounts.

The term 'structural priming[1]', alternatively known as 'syntactic priming' or 'structural persistence', is defined as a cognitive phenomenon by which processing of an utterance that was recently encountered facilitates a subsequent utterance which shares the same underlying syntactic representations (e.g., Bock, 1986; Pickering & Ferreira, 2008). In other words, structural priming is a tendency of learners to reuse the same syntactic structure as one that was encountered previously, even if they can use alternative structures that express the same meaning. For instance, when learners have heard and produced a passive sentence (e.g., 'the book is destroyed by the boy.'), they are more likely to produce another passive sentence (e.g., 'the table is moved by the man.') rather than an active sentence (e.g., 'the man moves the

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[1] This study adopts the term **'structural priming'**.

table.'). The explanation for this could be that, when learners hear and produce a certain syntactic structure, they store abstract syntactic representations for that structure which become activated and facilitate the subsequent production of the same syntactic structure (e.g., Bock, 1986; Bock & Griffin, 2000; Pickering & Branigan, 1998). Such notion supports the Levelt's (1989) speech production model in a way that the underlying representations of a recently heard and produced structure positively affects the formation of the subsequent syntactic structures. Several research studies claimed that structural priming occurs independently of any shared lexical items, closed-class elements and phonological or semantic features between prime and target sentences (e.g., Bock, 1986; Pickering & Branigan, 1998; Pickering & Ferreira, 2008). For example, the initial utterance "the teacher gave the student a book." and the subsequent utterance "the man sent his friend a letter." are unrelated in terms of their lexis, phonology or semantics, but share the same syntactic structure; that is, subject-verb-indirect object-direct object. This could suggest that, when learners operate the underlying syntactic representations by means of structural priming, their syntactic knowledge is independent of lexical and pragmatic knowledge.

A must-cited study on structural priming is Bock's (1986) first classic research that has had great influence on later work on structural priming in language production, comprehension and processing. Bock conducted a series of structural priming experiments in which L1 learners repeated prime sentences (i.e. transitive and dative structures), and afterwards they described the target pictures which were semantically unrelated to the prime sentences. The results showed that, when the learners had repeated the DO sentence (e.g., 'the man is reading the boy a story.'),

they were more likely to describe the subsequent picture of the man reading the boy a story using a DO sentence. The same trend was observed for active and passive sentences. Since Bock's original study, there have been several studies using the same methodological paradigm to examine the priming effects in a variety of L1 populations, and similar results have been observed, including children and adults (e.g., Garrod & Clark, 1993; Tomasello, 2000), aphasiacs (e.g., Saffran & Martin, 1997) and bilinguals (e.g., Hartsuiker et al., 2008). Recent research on structural priming has been extended to L2 literature (e.g., Ameri-Golestan, 2012; Hurtado & Montrul, 2021; Jiang & Huang, 2015; McDonough, 2006; McDonough & Mackey, 2008; Shin & Christianson, 2012), focusing on whether structural priming would improve L2 learners' performance in producing unfamiliar and more complex structures.

To sum up, structural priming occurs when the processing of a previously heard and produced utterance facilitates the processing of a subsequent utterance that shares the same underlying syntactic structures (e.g., Bock, 1986; Pickering & Ferreira, 2008). By the structural priming methodological paradigm, it is assumed that syntactic knowledge is independent of lexical and pragmatic knowledge. The next section describes certain factors affecting the occurrence of structural priming.

2.1.1 Factors Affecting Structural Priming

Structural priming researchers claimed that there are certain factors affecting the occurrence of structural priming, i.e. the level of language proficiency, frequency of the target structure, cumulation of prime sentences and lexical overlap.

Firstly, it is assumed that greater structural priming effects are likely due to the level of language proficiency. Several studies claimed that, after a series of structural priming experiments, high-proficiency learners had better production of the target structure than low-proficiency learners (e.g., Bernolet et al., 2012; McDonough, 2006). One major reason is that the abstract syntactic representations of low-proficiency learners are still underdeveloped, so they are assumed unable to form certain syntactic representations which are not appropriate enough to cause priming effects. The results in Morishita (2013)'s study on sentence production of Japanese EFL learners support this claim. In a series of experiment, the learners were asked to see written prime sentences and complete written target sentences using either PO sentences or DO sentences. The results showed that syntactic priming effects in high-proficiency learners were greater than in low-proficiency learners. Moreover, it was found that the learners with low language proficiency produced sentences other than target sentence including sentences with only one object and unsystematic order of arguments (e.g., ' *the girl gives a book the boy.'). This could suggest that the low-proficiency learners' syntactic representations of the target structures were not well formulated. In a similar vein, Jackson and Ruf (2017) studied priming effect in L2 production of German word order. It was found that structural priming in learners with low language proficiency was more semantically driven than syntactically driven because their abstract syntactic representations are still in their development. Nevertheless, some research studies provided counter evidence (e.g., Hartsuiker & Bernolet, 2017; Rowland et al., 2012). Rowland et al. (2012) investigated structural priming in speech production of

L1 children and adults. The findings indicated that priming effect was found stronger in children than in adults. This could be that children with limited knowledge of syntactic structures are more susceptible to priming effects owing to less competition of different candidate structures. Consistent with Rowland et al. (2012)'s study, Hartsuiker and Bernolet (2017) used the syntactic priming paradigm to investigate the development of syntax in L2 learners. They found that, after a series of priming experiments, low-proficiency learners drew upon their L1 knowledge to produce the target structures and rely more on imitation of the prime sentences. The findings suggested that learners with low language proficiency were more influenced by structural priming, compared to those with high language proficiency. In light of these findings, greater priming effects are observed in learners with lower and higher proficiency levels.

Apart from the level of language proficiency, frequency of the target structure also affects structural priming. Some studies claimed that the low-frequency structures are better primed than the high-frequency structures, thus resulting in an inverse-frequency effect (e.g., Hartsuiker & Westenberg, 2000; Yu & Zhang, 2020). Hartsuiker and Westenberg (2000) conducted a series of experiments in which Dutch learners read prime sentences and completed sentence fragments either with a participle-final or an auxiliary-final word order. They found that, after a structural priming session, the auxiliary-final word order was preferred to the participle-final word order. This suggests that the low-frequency auxiliary-final word order causes greater priming effects. Similarly, Yu and Zhang (2020) studied syntactic processing in Chinese spoken sentence production using the syntactic priming paradigm. Initial baseline

measurements showed that prepositional dative structure was preferred to the double-object dative structure. After a priming session, the baseline preference was reversed. Such effects could be accounted for by implicit learning mechanism (Bock & Griffin, 2000; Chang et al., 2006), which is discussed in Section 2.1.2.2. Results from these diverse set of studies show that priming effects were stronger for the low-frequency structures.

Besides the level of language proficiency and frequency of the target structure, cumulation of prime sentences also plays an important role in the occurrence of structural priming. It has been observed that structural priming effect has been shown to increase with the number of prime sentences (e.g., Jaeger & Snider, 2007; Kaschak, 2006). Segaert et al. (2016) compared participants who read three passive prime sentences to those who read one prime sentence. The results showed that structural priming effect was significantly larger in participants who had been exposed to three prime sentences than those who had been exposed to one prime sentence. In a similar vein, Wang and X. Wei (2018) examined cumulative effect of structural priming in Chinese EFL learners. It was found that a tendency of producing relative clause was found to increase with the number of sentences in the same construction primed previously. Results from these studies provide support for implicit learning mechanism, which is discussed in Section 2.1.2.2. That is, the meaning-form mappings are strengthened after being exposed to multiple prime sentences. These results suggest that multiple prime sentences could trigger greater priming effects.

Some studies have shown that the magnitude of structural priming becomes significantly larger when there is a lexical overlap, i.e. the verb and noun overlap (e.g., Arai et al., 2007; Branigan & McLean, 2016). Arai et al. (2007) explored structural priming effects on dative construction. The results showed that, if participants see a picture with a prime sentence that contains the verb 'give' in a DO construction and describe a new picture using the same verb, structural priming effects are larger than when they describe the picture with different verbs. Like Arai et al. (2007), Branigan and McLean (2016) conducted a series of experiments in which participants read prime sentences and describe the target pictures using either passive or active sentences. It was found that the increase in magnitude of priming effect was associated with having the same verbs across the prime and target sentences. This effect has been called 'lexical boost'. Researchers have explained the lexical boost effect as being caused by activation of a certain word, i.e. VERB — 'send' and its related structures, i.e. NP, PP — 'a letter to his mother' in dative structures that facilitates explicit memory[2] of the prime structure (e.g., Hartsuiker et al., 2008; Pickering & Branigan, 1998). This suggests that when a sentence is being processed, the repeated lexical item becomes a cue for learners to repeat the structure that was recently used. Thus, there will be larger of priming amount effects when the target sentence contains the same verb as was produced in the prime sentence. Apart from verb overlap, some research studies claimed that significant priming effects were observed when the prime and target sentences

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[2] **Explicit memory** or declarative memory refers the conscious and intentional recollection of previously encountered information, which is short-lasting in the absence of recall (Ullman, 2004).

share the same noun. Cleland and Pickering (2003) conducted a series of experiments in which participants repeated prime sentences and described target pictures using either adjective-noun order (e.g., 'the read sheep') or noun-relative clause order (e.g., 'the sheep that is read'). The results showed that the magnitude of the priming effect was significantly greater when the prime and target sentences use the same noun (e.g., 'sheep' — 'sheep') than when they do not (e.g., 'knife' — 'sheep'). However, it is claimed that this lexical boost effect is attributed to short-term memory because it is lexically driven (Pickering & Branigan, 1998). In light of these results, the magnitude of priming effects become significantly larger when the verb and the noun are repeated between prime and target sentences.

In conclusion, structural priming effects are assumed to associate with certain factors including the level of language proficiency, frequency of the target structure, cumulation of prime sentences and lexical overlap. The following section describes the three mechanistic accounts of structural priming in details.

2.1.2 Mechanistic Accounts of Structural Priming

Researchers have viewed structural priming as a short-term residual activation mechanism (Pickering & Branigan, 1998), a form of implicit learning of a certain syntactic structure (e.g., Bock & Griffin, 2000; Chang et al., 2006) or a combination of explicit memory process and implicit learning mechanisms (e.g., Chang et al., 2006; Shin & Christianson, 2012). The different mechanistic accounts of structural priming in language production, i.e. the Residual

Activation Account, the Implicit Learning Account and the Dual Mechanism

Account are reviewed in details in the following sections.

2.1.2.1 The Residual Activation Account

Researchers supporting the Residual Activation Account claim

that structural priming in language production occurs as a result of

activation of a certain word and its related structures (Pickering &

Branigan, 1998). In this view, structural priming effects have been

explained by Lavelt's model of speech production (Levelt, 1989) and

Roelofs' lemma stratum (Roelofs, 1992). In these models, words are

represented and activated at the conceptual level, and activation then

spreads to a lemma stratum (e.g., the base form of a word), which

represents a linguistic category (e.g., number, gender and tense) and

possible syntactic structures (e.g., combinatorial nodes).This activation

finally spreads to a word-form stratum where phonological and

morphological elements are specified. Thus, when a certain syntactic

structure has been produced, there will be residual activation of

combinatorial nodes for that structure. For instance, when the DO

structure (e.g., 'the boy gives the girl a book.') has been produced, its

combinatorial nodes, i.e. NP, NP — 'the girl, a book' which are linked to

its lemma node, i.e. VERB — 'give' are activated. Activation of these

nodes does not disappear immediately. These nodes are positively

assumed to affect the formation of the subsequent syntactic structures in a

way that it helps reduce cognitive load. Figure 1 illustrates structural priming process based on residual mechanism in details.

Figure 1

A model of structural priming based on residual activation mechanism proposed by Pickering and Branigan (1998)
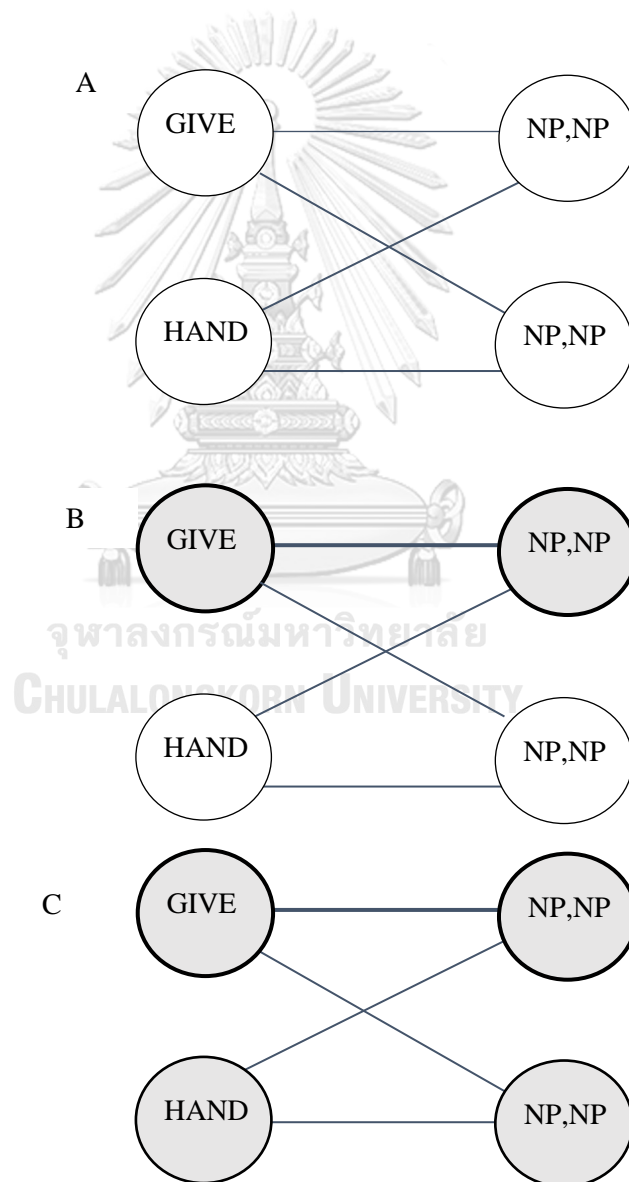
Figure 1 illustrates the model of structural priming in a DO sentence whereby thickness of the lines shows the degree of activation. These three models specify that residual activation depends on the link between the lemma nodes, i.e. 'GIVE' and 'HAND' and the combinatorial nodes, i.e. 'NP, NP'. Specifically, model (A) shows that before a prime sentence is repeated, there is no activation of the lemma nodes and its combinatorial nodes. Model (B) illustrates that when a prime sentence is repeated, there appears a high degree of activation of these nodes as shown by the thick lines. Model (C) shows that, after a prime sentence is produced, there is residual activation for that structure's combinatorial nodes, which is shared with other lemmas (e.g., HAND) that can take the same syntactic structure. This implies that, when learners are primed with a particular structure, they are more likely to produce another sentence with that structure in their subsequent utterances. This could mean that activation of combinatorial nodes, i.e. NP, NP has been retained for a short time, so learners can make use of such activation.

Moreover, this account predicts that there will be greater amount of priming effects when the target sentence has the same verb produced in the prime sentence. This increase in the priming effects has been termed 'lexical boost'. Nevertheless, structural priming effects are still observed, although the prime and target sentences do not share the same verb. The explanation for this could mean that the shared combinatorial nodes remain activated regardless of which verb is repeated. Therefore, this suggests that both lexically independent priming effects and lexically

dependent priming effects[3], i.e. lexical boost effects are caused by residual activation mechanism.

Different claims have been proposed to explain the priming effects based on the residual mechanism. Researchers supporting the Residual Activation Account also claim that structural priming effects involve explicit memory (Pickering & Branigan, 1998). That is, the prime sentences become a retrieval cue that enables learners to use their explicit memory to recall and then reuse the structure in the prime sentences. Thus, it is predicted that structural priming effects based on residual activation mechanism do not persist across multiple intervening sentences, i.e. sentence with different structures between prime and target sentences. In support of this claim, Pickering and Branigan (1998) manipulated a number of unrelated intervening sentences. They found that learners rarely reused the structure in the prime sentences in their speech productions when the target sentences did not immediately follow the prime sentences. This implies that the priming effects caused by residual mechanism do not persist across many intervening sentences. Such short-term effects are indicative of short-term activation changes, which is assumed to decay rapidly by a number of intervening sentences.

Other researchers provided counter evidence to explain cases where structural priming effects are long-lived (e.g., Bock & Griffin,

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[3] While the term **'lexically independent priming effects'** refers to the priming effects in the absence of lexical overlap between the prime and target sentences, the term **'lexically dependent priming effects'** refers to the priming effects in the presence of lexical overlap between the prime and target sentences (Pickering and Branign, 1998).

2000; Chang et al., 2006). These researchers claimed that larger priming effects were observed a week later, even the prime and target sentences were separated by intervening sentences. These findings point to a mechanism that causes long-term implicit learning of syntactic structures. Thus, the Residual Activation Account cannot adequately account for the time course of priming effects in language production.

To sum up, structural priming effects in language production based on the Residual Activation Account are caused by activation of a certain word its related structures, i.e. combinatorial nodes that help facilitate explicit memory of the prime's structure. Moreover, both lexically independent priming effects and lexically dependent priming effects, lexical boost effects caused by residual mechanism are assumed short-lived because it does not persist across multiple intervening sentences.

2.1.2.2 The Implicit Learning Account

Opposed to the Residual Activation Account, proponents of the Implicit Learning Account posits that structural priming in language production is consequence of implicit learning mechanism, rather than short-term activation changes (e.g., Bock & Griffin, 2000; Chang et al., 2006). In this account, structural priming is viewed as a form of implicit learning of a syntactic structure, which involves implicit memory[4].

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[4] **Implicit memory** or non-declarative memory refers to the unconscious and unintentional recall of previously encountered information, which is long-lasting even in the absence of further practice (DeKeyser, 1997)

Implicit learning is the unconscious acquisition of abstract information over a period of time (Seger, 1994). Specifically, Seger (1994) argued that learning is considered implicit if it meets these four criteria: (a) rules or structure cannot be explicitly explained by learners; (b) learning is for an abstract rule and complex knowledge, not just simple information or frequency count; (c) learning involves cognitive processing of information rather than explicit hypothesis testing; (d) learning is preserved in cases of amnesic patients.

Bock and Griffin (2000) argued that all of these criteria can be a possible source of structural priming effects in language production. In other words, the knowledge that emerges from structural priming experiments is assumed to reflect abstract and complex relationships between form and meaning that learners are unaware of and unable to explain. These researchers provided evidence for this claim by showing that structural priming effects persist across up to ten unrelated intervening sentences between prime and target sentences. If priming effects were due to short-term activation of a structure, then the prime's influence would decay more quickly. This implies that long-term priming effects are caused by implicit learning because the priming manipulation is so covert that learners are unaware of the prime sentences. Such long-lived priming effects occur independently of any shared lexical items. The findings suggested that lexically independent priming effects are caused by implicit learning mechanism. Similar to Bock and Griffin (2000)'s study, Shin and Christianson (2012) have also found long-term priming

effects, which supports the Implicit Learning Account of structural priming in language production. Specifically, they explored whether structural priming effects of English dative constructions and phrasal verb structures had been observed when one or more intervening sentences appeared between the prime and target sentences. The results revealed that priming effects were very robust and persist across several unrelated intervening sentences. It was also found that implicit learning through long-lag priming, i.e. more intervening sentences helped promote long-term production of English dative constructions.

Evidence supporting the implicit learning explanations for long-term priming effects in language production has been found. Chang et al. (2006) used error-based learning and meaning-form mappings models to account for structural priming through implicit learning. Specifically, they claimed that the acquisition of syntactic structures could be achieved by error-based learning and meaning-form mappings. In these models, learners try to predict the upcoming sentences. If these predictions are wrong, the learners will adjust their predictions to be more accurate. Such changes show how linguistic patterns in language is learnt implicitly and how those patterns are mapped onto meaning. After this learning, learners are assumed to be able to produce the next sentence from a representation of a previous syntactic structure. This implies that, if learners are exposed to several priming sentences, the priming effects may become greater. For example, when learners expect to hear a DO sentence (e.g., 'the man sends the girl a letter.') but then hear a PO sentence (e.g., 'the boy gives a

book to the girl.'), the expectation to hear a PO sentence in a subsequent utterance is likely to increase. These changes in expectation raise the possibility that the PO sentence is produced in subsequent production.

The error-based learning model also predicts that the low-frequency structure cause greater priming effects than the high-frequency structure, thus resulting an inverse-frequency effect (e.g., Chang et al., 2006; Pickering & Ferreira, 2008). Such effect is assumed to reflect implicit learning. That is, the low-frequency structure is subject to greater learning, while the high-frequency one is subject to less learning. This implies that the low-frequency structure triggers greater priming effects than the high-frequency structure (e.g., Hartsuiker & Westenberg, 2000; Yu & Zhang, 2020).

Other researchers also provided evidence to explain cases where structural priming seems to reflect implicit learning. Saffran and Martin (1997) investigated structural priming effects on the use of English transitive and dative structures in speakers with explicit memory problems. They found that when the speakers had repeated the dative sentence, they tended to describe the subsequent pictures using the same structure. The same trend was observed for transitive structure. If priming effects were due to explicit memory of the prime sentences, then the priming's influence would not be observed in brain-damaged speakers who have no explicit memory of the prime sentence. The findings suggested that structural priming was likely due to implicit learning, rather than explicit memory process. Results from these studies point to

the implicit learning mechanism that causes long-term facilitation of syntactic structures.

In conclusion, structural priming effects in language production based on the Implicit Learning Account are due to long-term implicit learning of syntactic structures. Moreover, findings for an inverse-frequency effect provide support for this implicit learning mechanism. Specifically, lexically independent priming effects caused by implicit learning are assumed long-lived because it does not decay by intervening sentences between the prime and target sentences. The next section discusses the Dual Mechanism Account of structural priming.

2.1.2.3 The Dual Mechanism Account

The Dual Mechanism Account claims that structural priming may be driven by both explicit memory process and implicit learning mechanism (e.g., Chang et al., 2006; Hartsuiker et al., 2008; Shin & Christianson, 2012). Similar to Bock and Griffin (2000), Hartsuiker et al. (2008) manipulated a number of unrelated intervening sentences in both spoken and written production tasks. Participants were asked to read sets of priming sentences with intervening sentences, and then describe the target pictures using either PO sentence or DO sentence. The results showed that structural priming effects in both modalities persisted across up to six intervening sentences between the prime and target sentences. Moreover, it was found that the magnitude of priming effects became significantly larger when the prime and target sentences shared the same

verb (lexical boost effects). However, such effects were found to decay by multiple intervening sentences. Hartsuiker et al. (2008) argued that, if the priming effects were due to implicit learning mechanism, then the priming's influence would be long-lived and persists across several intervening sentences. Thus, the implicit learning mechanism seems unable to account for the decay of priming effects.

In light of this finding, Hartsuiker et al. (2008) proposed an alternative analysis based on different durations in priming effects. That is, structural priming effects in language production could have been explained by at least two underlying mechanisms, i.e. residual activation mechanism and implicit learning mechanism. This suggests that lexically dependent structural priming effects, i.e. lexical boost are caused by short-term residual activation mechanism, while lexically independent structural priming effects are caused by long-term implicit learning mechanism. Therefore, the Dual Mechanism Account predicts that, when there are less intervening sentences between the prime and target sentences, structural priming effects occur as a result of explicit memory process, which lends support to the Residual Activation Account. When the prime and target sentences are separated by more intervening sentences, structural priming effects may involve implicit learning, supporting the Implicit Learning Account.

To sum up, structural priming effects in language production based on the Dual Mechanism Account have been driven by both short-term residual activation and

long-term implicit learning. The lexically dependent structural priming effects, i.e.
lexical boost effects caused by short-term residual activation mechanism are assumed
short-lived, while the lexically independent structural priming effects caused by long-term implicit learning mechanism are more long-lived.

2.2 Language Transfer and Markedness Theory

Language transfer or cross-linguistic influence is the process in which
learners' L1 influences the learners' use and acquisition of the L2. Odlin (1989, p. 27)
defined language transfer as "the influence resulting from similarities and differences
between the target language and any other language that has been previously (and
perhaps imperfectly) acquired". Language transfer is assumed to occur in all linguistic
subsystems including phonological, morphological, syntactic, pragmatic and
discoursal levels. Specifically, language transfer can be divided into positive and
negative transfer. In cases where the learners' L1 and the L2 are similar, similarities
may bring about "positive transfer". Positive transfer could facilitate or promote L2
acquisition. That is, learners may draw upon their L1 knowledge to acquire L2. For
example, L1 Thai learners may have better production of English PO construction
(e.g., 'the girl gave a book to her teacher.') because it exists in their L1. On the other
hand, in cases where the learners' L1 differs from the L2, the difference may cause
"negative transfer" or "interference" (Weinreich, 1953). Negative transfer could cause
difficulty in L2 acquisition. That is, properties of the learners'L1 are negatively and
interferingly transferred to L2 acquisition. For instance, L1 Thai learners of English
may produce the sentence '*the man showed his homework the teacher.', evidencing

the use of the theme-recipient order in DO construction which is grammatical in Thai but ungrammatical in English.

Language transfer is associated with Markedness Theory in a certain way. Eckman (1977) proposed Markedness Differential Hypothesis (MDA), arguing that transferability is determined by typological markedness. The hypothesis makes three predictions as follows.

(a) *Those areas of the target language which differ from the native language and are more marked that the native language will be difficult;*

(b) *The relative degree of difficulty of the areas of difference of target language which are more marked that the native language will correspond to the relative degree of markedness;*

(c) *Those areas of the target language which are different from the native language, but are not more marked than the native language will not be difficult.*

To apply the MDH, take dative constructions as an example. An investigation by White (1987) revealed that the PO construction is less marked because it is present in most languages. However, the DO construction is more marked since it appears only in a few languages. According to Pongyoo (2017), L1 Thai learners had little difficulty in using the English PO construction; however, they were likely to have trouble in producing English DO construction. This obviously appeals to the MDH in that the DO construction is more marked and difficult to be acquired than the PO construction, which is less marked. This could suggest that negative transfer tends to

occur when L2 learners acquire a structure in the L2 that is more marked than that in their L1.

The concept of 'saliency' is related to markedness. In L2A, the term 'saliency' refers to "the east with which learners are able to perceive grammatical features in input" (Ellis, 2008, p. 67). Features or structures that are salient will be attended to and acquired more easily than those that are not. For instance, the PO construction is assumed to be more salient than the DO construction in the input as the former construction is less marked, while the latter is more marked. Thus, L2 learners tend to acquire the PO construction sooner than the DO construction.

To sum up, language transfer refers to the influence which the learners' L1 exercises over L2A. In cases where the learners' L1 and the L2 have similar patterns, positive transfer may occur. In contrast, in cases where the L1 and the L2 are different, "negative transfer" or "interference" may arise. Negative transfer may occur when an L2 structure is more marked than that in their L1, and those less salient. Conversely, positive transfer could arise in case an L2 structure is less marked and therefore more salient.

2.3. Dative constructions in English and Thai

This section provides a comparison between English dative constructions and their counterpart in Thai. 2.2.1 and 2.2.2 discuss the dative constructions in English and dative constructions in Thai, respectively.

2.3.1 Dative Constructions in English

In English, the transfer events are expressed through dative construction, i.e. a construction which requires a dative verb; that is, a verb that requires two objects: a direct object and an indirect object, an agent argument (A) — a person who gives something, a recipient argument (R) — a person who receives something and a theme argument (T) — a thing which is transferred from the agent to the recipient. There are two main types of dative construction in English—namely, the Double-Object Dative Construction (DO) and the Prepositional Dative Construction (PO).

In the DO construction, the dative object is not marked by any morphemes. The three participants, i.e. an agent argument (A), a recipient argument (R), and a theme argument (T) are expressed as direct arguments of the verb because the arguments are not marked by any prepositions. There are two post verbal noun phrases appearing in a row without any markers, as shown in (5).

(5)   NP1   V   NP2   NP3

       AGENT   RECIPIENT THEME
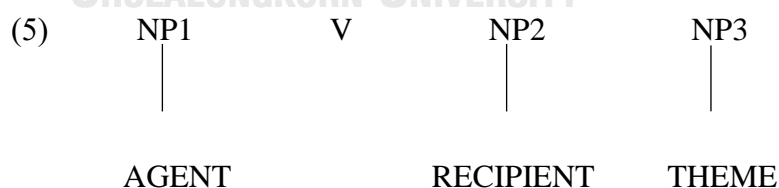
Examples:

(6)   a. [**Kim**] AGENT gave [**John**] RECIPIENT [**the book**] THEME.

       b. [**Mary**] AGENT sent [**her friend**] RECIPIENT [**the letter**] THEME.

Syntactically, the DO construction consists of an agent followed by a dative verb, an R-argument (NP2) and a T-argument (NP3). In examples (6a) and (6b), the verbs 'gave' and 'sent' take the indirect objects (NP2) 'John' and 'her friend' — R-arguments covertly marked by the dative case[5] and the direct objects (NP3) 'the book' and 'the letter'— T-arguments, respectively.

Apart from the DO construction, the transfer events in English can also be encoded by the PO construction. In this construction, the dative object is marked by the prepositions 'to' and 'for' (Pinker, 1989) . The three participants appear differently from those in the DO construction, i.e. the theme appears before the recipient. Only two participants, i.e. the A-argument and the T-argument are occupied by the verb, and the R-argument is marked by the prepositions 'to' or 'for', as shown in (7).

(7)   NP1   V   NP2   *to/for*   NP3

         AGENT   THEME   RECIPIENT

Examples:

(8)   a. [**Peter**] AGENT gave [**a pen**] THEME [**to Allan**] RECIPIENT.

           b. [**Emma**] AGENT baked [**a cake**] THEME [**for Ellis**]

BENEFICIARY.

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[5] **Dative case** is a grammatical case for nouns and pronouns which is used to show to or for whom action is taken. In English, the indirect object of a dative verb is covertly marked by a dative case (Radford, 2009)

In English, there are two types of the PO construction, namely, the To-Dative Construction and the For-Dative Construction (Pinker, 1989). In (8a), the verb 'gave' takes the direct object (NP2) 'a pen' — a T-argument and the indirect object (NP3) 'Allan' — the recipient of the object marked by the preposition 'to'. Sentence (8a) is called To-Dative Construction. In (8b), the verb 'baked' takes the direct object (NP2) 'a cake' — a T-argument and the indirect object (NP3) 'Allan'— the beneficiary of the object marked by the preposition 'for'. Sentence (8b) is called For-Dative Construction. It is worth noting that the For-Dative Construction is less frequently used than the To-Dative Construction (e.g., Pinker, 1989; Wolf-Quintero, 1992).

To sum up, while the dative object in the PO construction is marked by the prepositions 'to' and 'for', that in the DO construction is not marked by any morphemes.

2.3.1.1 Constraints on English Dative Alternation

Some dative verbs in English can occur in more than one dative construction, while others cannot. Such phenomenon is called 'dative alternation' (e.g., Mazurkewich & White, 1984; Pinker, 1989). The term 'dative alternation' refers to the alternation between the PO construction and the DO construction. Several dative verbs in English appear in the PO construction more than in the DO construction (e.g., Pinker, 1989; Wolf-Quintero, 1992). Since the transfer events in English can be encoded by two syntactic constructions, there are certain constraints on English dative

alternation. These constraints include a broad semantic constraint based on possession (2.2.1.1.1), narrow semantic constraint based on verb class membership (2.2.1.1.2) and a morphological constraint concerning phonological characteristics (2.2.1.1.3).

2.3.1.1.1 The Broad Semantic Constraint

There is a broad semantic constraint on occurrence of the DO and PO constructions (e.g., Pinker, 1989; Wolf-Quintero, 1992). In this constraint, the transfer events can be encoded by the DO construction and the PO construction if possession of an object by the recipient is affected by the action of the verb. Moreover, the recipient must be animate and capable of possession. If the recipient is inanimate, or the action does not directly benefit someone, the DO construction is ungrammatical, as shown in (9) and (10).

(9)   a. Mary sent a package to the boarder/border.

b. Mary sent the **boarder** the package. [+animate]

c. *Mary sent the **border** the package. [-animate]

(10)   a. John opened a beer/a window for Mary.

b. John opened Mary a beer.

c. *John opened Mary a window

Wolf-Quintero (1992, p. 99)

Example 9 shows that the recipient must be animate for the DO construction to be grammatical. However, sentence (9c) is the DO construction with the inanimate object 'border', hence ungrammatical. Example 10 shows that the action indirectly benefits someone without possession being affected. In (10c), the object opened is a window. This implies that there is no possession involved, and no one is directly affected by the action of window-opening, so the DO construction is not allowed.

Moreover, there are certain verbs in English that can occur only in the DO construction, but not in the PO construction because they do not express a sense of transfer of possession (e.g., Pinker, 1989; Wolf-Quintero, 1992). Generally, these verbs convey a sense that possession has been adversely affected, as shown in (11).

(11)   a. Mary **cost**/**denied**/**envied** John his promotion.

         b. *Mary **cost**/**denied**/**envied** John's promotion to/ for him.

Wolf-Quintero (1992, p. 101)

In (11), the verbs 'cost' and 'deny' show a sense that John did not get the promotion because of Mary's behavior. The verb 'envy' conveys a sense that John got the promotion, and Mary had envious feelings. Notice that there is no physical transfer of the promotion between John and Mary, but John's promotion has been affected by Mary's behavior. Therefore, the DO construction is

more grammatical than PO construction because there is no physical transfer between the two parties.

In addition to these verbs, there appear some verbs that can take the indirect object, but in their idiomatic use, they can only appear in the DO construction. Generally, these verbs show a sense that the indirect object comes into possession without transfer being affected, as shown in (12).

(12)   a. Mary **taught** John the lesson.
        b. Mary **taught** the lesson to John.
        c. *Mary **taught** the lesson to John. (idiomatic sense)

Wolf-Quintero (1992, p. 101)

It is true that a person can be taught by someone's action, but it is an awareness that the person gets it himself. In this use of idiomatic sense, the DO construction is allowed because possession by the indirect object has been affected. Nevertheless, in (12c), the PO construction is not possible because there is no physical transfer of the lesson.

To sum up, the DO construction admits the verbs which express the meaning of possession, while the PO one admits the verbs which express a sense of physical transfer. In cases in which the recipient is animate and the action directly involves transfer of possession, both the DO construction and PO construction are

possible. If there is possession of an object without transfer being involved, only the DO construction is grammatical.

2.3.1.1.2 The Narrow Semantic Constraint

Pinker (1989) claimed that the possessional constraint is a necessary condition on the English dative alternation but not sufficient. That is, even though some verbs convey a sense of transfer of possession to the animate receiver, they cannot appear in the DO construction, as shown in (13-16).

(13)   a. Mary **told**/**whispered** a secret to John.

b. Mary **told** John a secret.

c. * Mary **whispered** John a secret.

(14)   a. John **kicked**/**pushed** a ball to Mary.

b. John **kicked** Mary a ball.

c. * John **pushed** Mary a ball.

(15)   a. John **took**/**carried** an ice cream cone to Mary.

b. John **took** Mary an ice cream cone.

c. *John **carried** Mary an ice cream cone.

(16)   a. Mary **bought**/**chose** a new tie for John.

b. Mary **bought** John a new tie.

c. *Mary **chose** John a new tie.

Wolf-Quintero (1992, pp. 103-104)

Examples 13-16 show that the verbs denote a transfer of objects to someone. Nevertheless, the verbs 'whisper', 'push', 'carry' and 'choose' do not allow the DO construction even though their meanings are similar to the verbs 'tell', 'kick', 'take' and 'buy'. This could suggest that broadly possessional constraint seems unable to adequately account for the English dative alternation (e.g., Pinker, 1989; Wolf-Quintero, 1992).

Pinker (1989) proposed an alternative analysis of dative verbs in English based on narrow semantic features to account for English dative alternation. These semantic features include motion, manner, accompaniment, illocution, causation, intention, communication etc. When the verbs share the same semantic features, they become members of the same verb class. Specifically, Pinker defined fourteen verb classes, where, in each class, verbs share similar semantics and certain alternations, as shown in Table 1.

Table 1

Fourteen verb class membership adapted from Pinker (1989)

	Fourteen Verb Classes		
	Verbs		
Semantic types	**Alternating**	**Non-alternating**	
	(DO or PO)	**(PO only)**	**(DO only)**
Giving	give, hand, sell, pass	donate, contribute	
Instantaneous causation of motion	throw, kick, toss, slap, lob	release, propel	
Sending	send, mail, ship	transport	
Continuous causation of transfer	take, bring	-	
Future having	offer, promise, allow, recommend	-	
Communication	tell, show, teach, write, read	explain	announce, describe, declare, demonstrate
Creation	bake, make, build, cook, fix, pour	construct, create, design	
Obtaining	find, order, earn, get, buy	purchase, obtain	
Instrument communication	radio, telephone, fax, wire, email, modem	-	
Fulfilling	-	supply, credit, present, entrust	
Accompanied motion	-	carry, pull, push, lift, lower	
Choosing	-	choose, pick, select	
Manner of speaking	-	shout, whisper, scream	
Communication	-	say, ask	

Within each of these verb classes, verbs are semantically similar to one another because they share the same semantic types in common. Pinker narrowly divided verbs in these fourteen classes into two main categories including 'alternating category' and 'non-alternating category'. For instance, the verb 'give' belongs to the alternating verb class because it can appear either in the DO

construction or the PO construction. Nevertheless, the verb 'carry'

belongs to the non-alternating verb class because it can appear only

in the PO construction. Among those of fourteen types of verb

classes, there are six types whose usages overlap between

alternating category and non-alternating category, including verbs of

giving, verbs of sending, verbs of instantaneous causation of

ballistic motion, verbs of communication, verbs of creation and

verbs of obtaining. In other words, these types of verb can be both

alternating verbs and non-alternating verbs. When new verbs enter

the language, they can undergo alternation only if they share similar

meanings (e.g., Pinker, 1989; Wolf-Quintero, 1992).

In summary, English dative alternation based on narrow

semantic features is determined by verb class membership rather

than possession constraint. In other words, verbs can undergo

alternation only if they are members of the same verb class.

2.3.1.1.3 The Morphological Constraint

In addition to the broad semantic constraint and the narrow

semantic constraint, there is also a morphological constraint on

occurrence of English dative alternation. In this constraint, native

English verbs can appear in the DO construction, but verbs of the

French and Latin origin cannot, as shown in (17-18).

(17)   a. Mary **gave**/**donated** a painting to the museum.

        b. Mary **gave** the museum a painting.

        c. *Mary **donated** the museum a painting.

(18)   a. Mary **told**/**reported** the news to the public.

        b. Mary **told** the public the news.

        c. *Mary **reported** the public the news.

Wolf-Quintero (1992, p. 107)

Examples 17-18 show that, although the meaning of each pair of words, i.e. 'give' — 'donate' and 'tell'— 'report' is similar to each other, the DO construction admits only the native English verbs. Historically, there were case markers for the dative case and the accusative case in Old English (Wolf-Quintero, 1992). Thus, the arguments order of a dative sentence was 'V NP-DAT NP-ACC' which is more common than the order 'V NP-ACC NP-DAT' (Visser, 1963). When case markers disappeared in Middle English, the argument structure of a dative sentence became 'V NP RECIPIENT NP THEME' which is similar to the DO construction in Modern English. However, in the 14th and 15th centuries, several verbs of the French and the Latin origin began to have R-arguments marked by the preposition 'to'. This is why the native English verbs can appear in this argument structure (i.e. the PO construction), but verbs of French and Latin origin cannot appear in the DO construction.

Apart from the explanation concerning etymology, there is still another explanation of English dative alternation which is related to phonological characteristics. Wolf-Quintero (1992) claimed that, while native English verbs allow the DO construction, Latinate verbs do not. This could be due to the stress associated with native English verbs. While native English verbs are one metrical foot (i.e. a single stressed syllable or stress on the first syllable of two), Latinate verbs are more than one metrical foot. Nevertheless, Pinker (1989) claimed that Latinate verbs can appear in the DO construction if they have one stressed syllable, as shown in (19).

(19)   a.   Mary **offered**/**promised**/ **recommended**/ **described** a book to John.

        b. Mary **offered**/**promised** John a book.

        c. *Mary **recommended/described** John a book.

Wolf-Quintero (1992, p. 108)

In (19b), the Latinate verbs 'offer' [ˈɔːfər] and 'promise' [ˈprɒm.ɪs] can take the DO construction because they have two syllables with stress on the first syllable. However, the verbs 'recommend' [ˌrek.əˈmend] and 'describe' [dɪˈskraɪb] are not allowed in the DO construction because they have more than one syllable with the initial unstressed syllable.

To sum up, native English verbs can appear in the DO construction, but verbs of the French and the Latin origin cannot. If the Latinate verbs have two syllables with stress on the first syllable, they are grammatical in the DO construction.

2.3.2 Dative Constructions in Thai

While there are two constructions for encoding transfer events in English, there exist three constructions in Thai, namely, the Double-Object Dative Construction (DO), the Prepositional Dative Construction (PO) and the Serial Verb Construction (Thepkanjana, 2010).

The DO construction in Thai consists of three participants, i.e. an agent argument (A), a recipient argument (R), and a theme argument (T). These participants are expressed as direct arguments of the verb, but they appear differently from those in English, i.e. the T-argument appears before the R-argument, as shown in (20).

(20)   NP1   V   NP2   NP3
         | | |
        AGENT   THEME   RECIPIENT
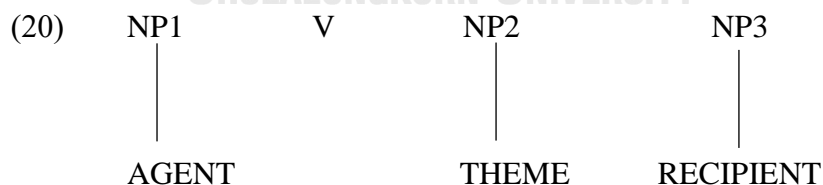
Examples:

(21)   a. Sǒmchaay   hâj   **nǎŋsǔɯ dèk**

        Somchaay   give   book   child

        'Somchaay gave books to children.'

b. Sǒmchaay   pɔ̀ɔn **khâaw   lûuk**

Somchaay   feed   rice   child

'Somchaay fed the baby some rice.'

In this construction, there are two post verbal noun phrases appearing in a row without any markers. The post verbal noun phrase (NP2) appearing immediately after the verb is the T- argument, while the other one is the R-argument. In examples in (21a) and (21b), the verbs 'give' and 'feed' take the direct objects (NP2) năŋsɯ̌ɯ 'book' and khâaw 'rice' — the T-arguments and the indirect objects (NP3) dèk 'child' and lûuk 'child'— the R-arguments, respectively.

The Thai PO construction consists of three participants, i.e. an agent argument (A), a recipient argument (R), and a theme argument (T). The three participants appear in the same word order as in the English PO construction; that is, the T-argument appears before the R-argument, and the third participant is marked by the prepositions 'kɛ̀ɛ' and 'dɛ̀ɛ', as shown in (23).

(22)   NP1   **V**   NP2   *kɛ̀ɛ/ dɛ̀ɛ*   NP3
        | | |

        AGENT   THEME   RECIPIENT

Examples:

(23)   a. Sǒmchaay   hâj   ŋən   **kɛ̀ɛ**   dèk   yâakcon

Somchaay   give   money   PREP   child   poor

'Somchaay gave some money to poor children.'

b. Sǒmchaay   mɔ̂ɔp   khɔ̌ɔŋkhwǎn   **dɛ̀ɛ**   khánábadii

Somchaay   present   gift   PREP   dean

'Somchaay presented a gift to the dean.'

Thepkanjana (2010, p. 411)

In this construction, the recipient argument is expressed with the prepositions 'kɛ̀ɛ' or 'dɛ̀ɛ'. In (23a), the verb hâj 'give' takes the direct object (NP2) ŋən 'money' — a T-argument and the indirect object (NP3) dèk yâakcon 'poor children'— an R-argument marked by the preposition kɛ̀ɛ 'to'. In (23b), the verb mɔ̂ɔp 'present' takes the direct object (NP2) khɔ̌ɔŋkhwǎn 'gift' — the T- argument and the indirect object (NP3) khánábadii 'dean'— an R-argument marked by the preposition dɛ̀ɛ 'to'. In Thai, the preposition 'dɛ̀ɛ' is more formal than the preposition 'kɛ̀ɛ'. These two prepositions can be used interchangeably without affecting the meaning of a sentence and can be omitted if the sentences are used in informal contexts (Thepkanjana, 2010).

In addition to the DO and PO constructions, the transfer event in Thai can be expressed through the Serial Verb Construction. In this construction, the transfer event is encoded by means of two verbs in one construction sharing the three participants between them. According to Thepkanjana (2010), there are

two types of the Serial Verb Construction: the T-type Serial Verb Construction and the R-type Serial Verb Construction.

In the T-type Serial Verb Construction, a serial verb introduces the T-argument. The serial verbs aw 'take' introduces the T-argument. The two verbs in a sentence may or may not share the same subject. The T-type Serial Verb Construction is shown in (24).

(24) a. *khǎw **aw** kankray **tàt** kràdàat*

he   take scissors cut   paper

'He took the scissors to cut the paper.'

Thepkanjana (2010, p. 412)

In (24), the two verbs share the same subject khǎw 'he', and the serial verb tàt 'cut' introduces the T-argument denoted by the first verb aw 'take'. Sentence (24a) is called the T-type Serial Verb Construction because the T-argument is introduced by the serial verb.

In the R-type Serial Verb Construction[6], the serial verb hâj 'give' introduces the R-argument. This construction consists of two verbs with their own objects in one sentence, as shown in (25).

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[6] In Thai, the transfer events are expressed through the PO construction, the DO construction and the Serial Verb Construction. However, the Serial Verb construction is not considered a dative construction.

(25)　　NP1　　　　**V**　　　　NP2　　　*hâj*　　NP3

　　　　　　│　　　　　　　　　　│　　　　　　│

　　　　AGENT　　　　　　　THEME　　　　RECIPIENT
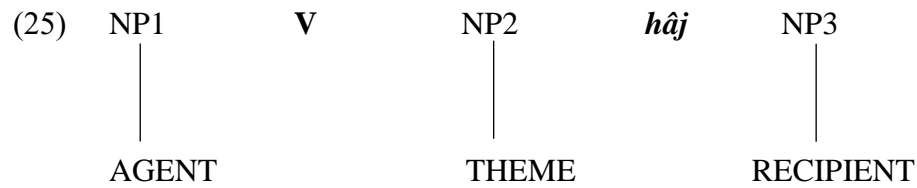
Examples:

(26)　a. Sŏmchaay　**sòŋ**　còtmăay　**hâj**　phɯ̂an

　　　Somchaay　send　letter　give　friend

　　　'Somchaay sent a letter to his friend.'

　　　b. Sŏmchaay　**yìp**　năŋsɯ̌ɯ　**hâj**　lûukchaay

　　　Somchaay　pick up　letter　　give　son

　　　'Somchaay picked up a book and gave it to his son.'

Thepkanjana (2010, p. 413)

In each example in (26), the two verbs share the same subject 'Somchaay', and the serial verb hâj 'give' introduces the R-argument denoted by the first verb sòŋ 'give' and yìp 'pick up'. This is called the R-type Serial Verb Construction because the R-argument is introduced by the serial verb.

In summary, the transfer events in Thai can be encoded by the PO construction, the DO construction and the Serial Verb Construction. Specifically, the Thai PO construction and the English PO construction have the same syntactic structure and argument order. In contrast, the Thai DO construction and the English DO construction have the same syntactic

structure but different argument order; that is, while Thai uses the theme-recipient order, English uses the recipient-them order.

2.3.2.1 Constraints on Thai Dative Alternation

Similar to English, there are certain constraints on Thai dative alternation. These constraints include a semantic constraint and a heaviness constraint (Thepkanjana, 2010).

2.3.2.1.1 The Semantic Constraint

Thepkanjana (2010) proposed an analysis of Thai dative alternation based on the semantic types of verb which is similar to the narrow semantic constraint proposed by Pinker (1989). In this constraint, the verbs are classified into five types, including verbs with an inherent sense of giving or change of possession, verbs of imparting information, verbs of application substances, verbs of caused motion and verbs of creation. Within each of these verb classes, verbs share similar meaning and certain alternations.

It is noted that the semantic types of verb that can appear in all the three dative constructions include verbs with an inherent sense of giving or change of possession and verbs of imparting information, as shown in (a-b).

(a)   *Verbs with an inherent sense of giving or change of possession*

hây 'give', mɔ̂ɔp 'present', khǎay 'sell' and pɔ̂ɔn 'spoonfeed'

(b)   *Verbs of imparting information*

sɔ̌ɔn 'teach', bɔ̀ɔk 'tell', cɛ̂ɛŋ 'inform' and nɛ́ʔnam 'suggest'

Examples

(27)   a. Somchaay **mɔ̂ɔp** khɔ̂ɔŋkhwǎn (dɛ̀ɛ/ hâj) khánábadii

Somchaay present gift   PREP/give dead

'Somchaay presented a gift to the dean'

b. Somchaay **sɔ̌ɔn** khanítsàat (kɛ̀ɛ/ hâj) nákrian

Somchaay teach mathematics PREP/give student

'Somchaay taught students mathematics.'

Thepkanjana (2010, pp. 415-416)

In examples in (27a) and (27b), the two verbs mɔ̂ɔp 'present' and sɔ̌ɔn 'teach' express roughly the same meaning; that is, an agent does something which physically and abstractly moves an entity to the target. It is worth noting that the preposition kɛ̀ɛ and the verb hâj meaning 'give' in the parentheses can be omitted without affecting the meaning of a sentence.

Notice that verbs which can occur only in the DO Construction are verbs of application of substances, as shown in (c).

(c)   Verbs of application substances

phôn 'spray (paint)' and thaa 'paint'

Examples

(28)   a. Sǒmchaay **phôn** sǐi   rót   lέεw

Somchaay   spray   color   car   already

'Somchaay already sprayed the car.'

b. Sǒmchaay **thaa** sǐi   bâan   lέεw

Somchaay   paint   color   house   already

'Somchaay already painted the house.'

Thepkanjana (2010, p. 416)

In (28a-b), the verbs phôn 'spray' and thaa 'paint' carry a sense of abstract transfer. The word rót 'car' and bâan 'house', which do not express a strong sense of the recipient are the inanimate receivers. Thepkanjana (2010) claimed that the PO construction admits only the verbs which have a sense of transfer to an animate recipient. Thus, verbs of application of substances can appear only in the DO Construction.

The two types of verbs which can appear only in the Serial Verb Construction are verbs of caused motion and verbs of creation, as shown in (d-e).

(d)   *Verbs of caused motion*

sòŋ 'send', yûɯɯn 'hand in', yìp 'pick up', tèʔ 'kick' and khwâaŋ 'throw'

(e)   *Verbs of creation*

sâaŋ 'build', tèŋ 'compose' and wâat 'draw'

Examples

(29)   a. Sǒmchaay **sòŋ** ŋən hâj phɔ̂ɔ

Somchaay   send   money give   father

'Somchaay sent some money to his father.'

b. Sǒmchaay **sâaŋ** bâan hâj mɛ̂ɛ

Somchaay   build   house   give   mother

'Somchaay built a house and gave it to his mother.'

Thepkanjana (2010, p. 417)

In examples in (29a) and (29b), the serial verb hâj 'give' introduces the R-arguments phɔ̂ɔ 'father' and mɛ̂ɛ 'mother' denoted by the first verb sòŋ 'give' and sâaŋ 'build', respectively. Notice that the verb hâj 'give' expresses a sense of transfer, which can co-occur with verbs of caused motion and verbs of creation.

To sum up, the occurrence of Thai dative constructions based on semantic constraint is determined by the meaning of the verbs.

2.3.2.1.2 The Heaviness Constraint

Apart from the semantic constraint, there is also a heaviness constraint on occurrence of the DO Construction (Thepkanjana, 2010). In this constraint, the theme noun phrase must not be heavy for the DO Construction to be grammatical. In other words, a modifying phrase or clause of the theme argument must appear at the end of the sentence, as shown in (30).

Examples:

(30)   a. naaycâaŋ   môɔp   ŋən   phŏm

       boss   give   money   I

'The boss gave me some money.'

b. *naaycâaŋ   môɔp   ŋən   hâarɔ́ɔy   bàat   phŏm

   boss   give   money   five hundred   Baht   I

'The boss gave me five hundred Baht.'

c. naaycâaŋ   môɔp   ŋən   hâarɔ́ɔy   bàat   kɛ̀ɛ   phŏm

   boss   give   money   five hundred   Baht   PREP   I

'The boss gave me five hundred Baht.'

Thepkanjana (2010, p. 421)

Sentence (30a) is the DO Construction without a heavy theme noun phrase, thus grammatical. On the other hand, sentence (30b) is the DO Construction with a heavy theme noun phrase, which is ungrammatical. This is because the quantified phrase hâarɔ́ɔy bàat 'five hundred Baht' does not appear immediately after the theme. This could suggest that it is ambiguous to put the recipient argument after a modified theme noun phrase, which is considered heavy. Thepkanjana (2010) claimed that the construction that best allows the presence of the modifying phrase or clause is the PO construction, not the DO Construction, as shown in sentence (30c).

In summary, there are two conditions on alternations among the three dative constructions in Thai, including the semantic constraint based on the meaning of the verbs and the heaviness constraint concerning sentence structure.

2.4 Previous Studies on the Acquisition of L2 English Dative Constructions

The acquisition of L2 English dative constructions has been extensively investigated in the field of L2 acquisition. One aspect that has received particular attention is the issue of whether L2 learners could acquire the said constructions.

Chang (2004) explored Chinese EFL learners' acquisition of English dative constructions. Participants were classified into an intermediate proficiency group and an advanced proficiency group. Data collected from a writing task and a reading task showed that the learners in both proficiency groups produced more PO sentences than

DO sentences in the two tasks. Chang concluded that the PO construction was less cognitively complex, thus preferred by the learners.

Hamdan (1994) examined the acquisition of English dative constructions by L1 Arabic learners using a framework of transfer and markedness. Data were obtained from a grammaticality judgment task, a picture description task and a translation task. In a series of experiment, the participants were asked to judge whether each sentence was correct, describe the pictures orally and complete an Arabic-English translation task. The findings showed that the L1 Arabic learners had better production of the PO construction than the DO construction in the three tasks. It was assumed that the DO construction seemed to be more complicated than the PO Construction. The researcher concluded that the learners' low rates of suppliance of English DO Construction may have been the result of differences between English and Arabic.

Inagaki (1997) carried out an experiment with Chinese-speaking learners and Japanese-speaking learners of English on the use of English dative constructions. Data were collected from an acceptability judgment task. The findings showed that L1 Chinese learners were able to distinguish the DO sentences containing the 'Tell-class' verbs from those with 'Whisper-class' verbs because their L1 had such a distinction, but not the DO sentences containing the 'Throw-class' verbs from those containing 'Push-class' verbs due to the non-existence of such a distinction in their L1. Moreover, the L1 Japanese learners were found to be able to distinguish the English DO sentences containing the 'Tell-class' verbs from those with 'Whisper-class' verbs despite the lack of such a distinction in Japanese, but not the DO sentences containing the 'Throw-class' verbs from those with 'Push-class' verbs despite the existence of such a distinction in their L1. Inagaki concluded that, while similarities between

learners' L1 and L2 facilitated their L2 acquisition, differences between the learners' L1 and L2 hindered their L2 acquisition.

Whong-Barr and Schwartz (2002) investigated the acquisition of English to-dative and for-dative constructions by comparing the data from two L1 groups (Korean and Japanese) under the assumption of the Full Transfer Hypothesis. Whong-Barr and Schwartz hypothesized that (1) Japanese learners whose L1s lacked both to-dative construction and for-dative construction could not acquire such constructions in their L2; and (2) Korean learners whose L1s had a similar construction to English, i.e. for-dative construction and a different construction, i.e. to-dative construction could acquire only to-dative construction. Data were collected from an oral acceptability judgement task. The results confirmed the Full Transfer Hypothesis (Schwartz & Sprouse, 1996) in that the L1 Japanese learners were capable with both to-dative construction and for-dative construction due to existence of such constructions in Japanese. However, the L1 Korean learners were more capable with to-dative construction than for-dative construction due to a lack of such construction in their L1. Moreover, the L1 Japanese learners were found to variably produce the English for-dative construction. Whong-Barr and Schwartz concluded that the correct use of dative constructions was influenced by positive transfer, while the errors found in the learners' production were influenced by negative transfer.

Pongyoo (2017) studied the acquisition of the English dative constructions by 60 L1 Thai learners, who were divided into three proficiency groups: a low proficiency group, an intermediate proficiency group and an advanced proficiency group. The study aimed at investigating whether there was any correlation between the level of English proficiency and the use of English dative constructions. Data were

collected from an acceptability judgment task and an elicited production task. The findings showed that the learners in all proficiency groups were more accurate in judging the sentences with PO construction, which was considered a less complicated construction, than those with DO construction, which was considered a more complicated construction. Specifically, the advanced learners were better at using the DO construction because they were exposed more frequently to this construction type. Pongyoo suggested that, while the low proficiency learners and the intermediate learners were assumed to draw upon their L1 knowledge to complete the tasks, the advanced learners possibly relied more on the L2.

The results from these studies showed that problems of the acquisition of English dative constructions by L2 learners from various L1 backgrounds have been well-attested. It was assumed that the problems occurred as a result of the learners' L1 interference.

2.5 Previous Research Studies on Structural Priming in Second Language Acquisition

A number of studies have been conducted on structural priming effects on the use of various syntactic structures by learners from various L1 backgrounds.

Flett (2003) investigated whether syntactic priming facilitated the use of passive constructions in Spanish speech production. There were 36 participants, including 12 native speakers of Spanish, 12 intermediate and 12 advanced English speakers of L2 Spanish. The Spanish passive construction was the target structure under investigation. Data were collected from a picture description task. In a series of experiment, the participants and a confederate were required to describe the pictures to each other,

whereby each picture can be described using either a passive sentence or an active sentence. The results revealed that the priming effect was larger in the L2 speakers than the native speakers, and larger in the advanced L2 speakers than the intermediate speakers. It was also found that the intermediate group was found to produce some incorrect passive constructions. This could be that L2 speakers of a language had less experience with the language, so any representations for the language tended to be of a weaker strength than those in native speakers. However, the effect of same and different verbs was the same in the all three groups. This would suggest that the priming effect observed was not the simply conscious repetition of structures because such an effect was always stronger for different than same verbs. If the effect had been from repetition, the difference across conditions may not have been found.

McDonough (2006) investigated whether structural priming would improve learners' performance in producing English dative constructions. Thirty L2 learners from different L1 backgrounds were the subjects of investigation in this study. A confederate scripting technique was adopted to explore whether syntactic priming occurred during interaction between L2 English learners. Two experiments were conducted. In experiment 1, the learners were primed with both PO and DO sentences, while they were primed with only DO sentences in experiment 2. The results showed that the interaction between L2 learners and more advanced English speakers showed evidence of structural priming for the PO construction, but not for the DO construction in experiment 1. This could be assumed that the DO construction had complex semantic and morphological rules required for the online production. Similar to experiment 2, the learners were not found to produce more DO sentences after DO prime sentences.

Biria and Ameri-Golestan (2010) studied the effects of syntactic priming on production of English indirect questions and requests by L1 Persian learners. The study aimed at investigating whether the exposure to indirect questions and requests in L2 increased the likelihood of subsequently producing these structure in L2 and examining whether syntactic priming in the oral contexts encouraged the renewed use of indirect questions and requests in upcoming written production. Eighty L1 Persian learners of English were divided into four groups based on their proficiency: Experimental High-proficiency group, Experimental Mid-proficiency group, Control High-proficiency group, and Control Mid-proficiency group. Data were collected from a picture description task. In a series of experiment, the participants were asked to describe the target pictures orally in Experiment 1 and then complete target written sentences in Experiment 2. The findings from Experiment 1 showed that the participants who had been primed for the target structure produced more the target structures than those who had not. Similar findings were observed in Experiment 2. This would suggest that syntactic priming helped facilitate L2 acquisition. However, it was found that the priming effects were not transferred from speaking to writing.

Shin (2010) examined cross-linguistic syntactic priming effects on the production of English dative constructions by Korean-English bilinguals. Data were collected from an auditory sentence recall task, which was designed based on Shin and Christianson (2012). In a series of experiment, the participants were asked to listen to some Korean sentences, English sentences, and English word probes, respectively, and afterwards repeat the Korean sentences. Then, they were asked to fill the gaps in a cloze test with appropriate dative constructions. The results showed that cross-linguistic syntactic priming effects for dative constructions in Korean-English bilingual

production were not observed because the participants did not produce Korean dative sentences after they had repeated English dative sentences, or vice versa. This could suggest that L1 Korean sentence did not affect L2 English sentence production.

Ameri-Golestan (2012) studied the acquisition of English passive construction in Iranian EFL learners using a priming methodological paradigm. Specifically, the study aimed at examining whether structural priming improved the L2 learners' production of the passive construction. Sixty Iranian EFL learners were divided based on their language proficiency into four experimental and control groups, namely, Experimental High-Proficiency group, Experimental Mid-Proficiency group, Control High-Proficiency group, and Control Mid-Proficiency group. Data obtained from a picture description priming task showed that the participants who had been primed for the passive sentences produced more of the passive sentences than those who had not, although this structure seemed underrepresented in the production of Persian learners of English, thus resulting in an inverse frequency effect. It was also found that the proficiency levels made a significant difference in production of the target structure; that is, the higher proficient participants had higher scores of passive production. This would suggest that greater priming effects were observed in learners with higher proficiency levels.

Shin and Christianson (2012) examined whether structural priming improved performance in producing L2 syntactic structures among L1 Korean learners. The target structures were the DO Construction (e.g., 'the boy is handing the signer a guitar.') and separated phrasal-verb structures (e.g., 'the man is putting the fire out.'). Data were collected from a picture description priming task and a grammatical judgement task. In a series of experiment, the learners were asked to repeat prime sentences and describe

the target pictures using the target structures. These experiments were conducted through implicit instruction learning and explicit instruction learning. The findings showed that structural priming improved complex DO construction, and this improvement was observed to persist overtime. Similar results were observed for the separated phrasal-verb structure. Shin and Christianson suggested that, when there were less intervening sentences between the prime and target sentences, the priming effects were due to explicit memory process. However, when the prime and target sentences were separated by more intervening sentences, the priming effects involved implicit learning process. The results from this study pointed to the Dual Mechanism Account.

Jiang and Huang (2015) studied the acquisition of English dative constructions by L1 Chinese EFL learners using a structural priming paradigm. Specifically, the study aimed at investigating whether structural priming can facilitate L2 acquisition of English DO construction in short-term and long-term periods and whether each priming condition had different learning effects. The participants of the study were 60 lower intermediate Chinese EFL learners equally divided into three groups: a control group, a no-lag priming group and a long-lag priming group. Data obtained from a picture description priming task showed that the experimental groups produced more DO picture descriptions in English after they had just heard the DO sentences. It was also found that the no-lag priming group performed better than the long-lag priming group in the immediate posttest. It was assumed that, when there were less intervening sentences between the prime and target sentences, the syntactic information of the prime sentence, i.e. the DO sentence was better retained in the participants' memory, so they needed less processing load to recall the structure in their short-term memory. However, when there were more intervening sentences between the prime and target

sentences, what retained in participants' memory was the syntactic information of the intervening sentence other than that of the prime sentence. Since the participants had more processing load to retrieve the DO sentence information in their memory, they tended to use other structures than the DO sentence in the immediate picture description priming task. Jiang and Huang claimed that the results could be explained by the Residual Mechanism Account.

McDonough and Kim (2016) investigated working memory and structural priming effects in L2 learners. The participants were 64 L2 English learners from different L1 backgrounds divided into three priming condition groups, i.e. a no-lag group, a two-lag group and a five-lag group. Data were collected from a picture description priming task and an aural running span task. In experiment 1, the participants were required to read prime sentences and describe the target pictures using either passive or active sentences. In experiment 2, they were asked to listen to a series of letter and recall the last letter. Data from these experiments were compared to examine whether there was any correlation between working memory and the priming effects. The results showed that the learners produced significantly more passive sentences following passive prime sentences than in unprimed contexts. However, the priming effects were found not to associate with working memory, regardless of lag-conditions.

Hurtado and Montrul (2021) examined syntactic priming effects within language in monolingual Spanish speakers, heritage speakers and L2 speakers. Specifically, the study aimed at investigating whether syntactic priming promoted L2 acquisition of Spanish clitic doubling constructions (e.g., Antonio le dio una manzana a María. 'Antonio gave María an apple.'), both in short-term and long-term periods. Data

collected from a picture description priming task showed that when the participants in the three groups had repeated the DO sentence, they were more likely to describe the subsequent picture in Spanish using a DO sentence. However, heritage speakers and L2 speakers showed significant long-term priming effects for the DO construction. Moreover, it was found that, after a syntactic priming session, the recipient construction (e.g., 'the man is donating some money to the hospital.'), which was considered a high-frequency structure, was preferable to the non-recipient construction (e.g., 'the girl is stealing some money.'), which was considered a low frequency structure. Hurtado and Montrul concluded that the high-frequency structure caused greater priming effects, as opposed to an inverse frequency effect. The results from this study pointed to the implicit learning mechanism that causes long-term facilitation of syntactic structures.

There has been only one study conducted in this area where the participants' L1 is Thai, and their L2 is English. McDonough and Mackey (2008) investigated whether syntactic priming improved performance of L1 Thai learners in producing English questions. The participants were 46 intermediate L1 Thai learners of English. Data were obtained from a confederate script technique. In a series of experiment, the participants were asked to carry out communicative activities with a more advanced L2 English interlocutor who had been scripted with developmentally advanced question form. Then, participants were asked to complete two oral post-tests using the same technique. The results indicated that the participants who often produced developmentally advanced English questions after hearing a scripted interlocutor produced such questions were more likely to move to a higher stage of English question development.

There has been much research exploring structural priming effects on the acquisition of various English syntactic structures by L2 learners with different L1

backgrounds such as passives construction by L1 Korean learners (Kim & McDonough, 2008), L1 Spanish learners (McDonough & Kim, 2016), dative constructions by L1 Chinese learners (e.g., Jiang & Huang, 2015; Shin & Christianson, 2012), indirect questions/request by L1 Persian learners (Ameri-Golestan, 2010) and separated-phrasal verb structures by L1 Korean learners (Shin & Christianson, 2012). The results from these studies showed that structural priming improved L2 learners' production of the syntactic structures which are difficult for the L2 learners to process. However, to the best of my knowledge, there has been only one study using a structural priming paradigm to investigate the English question development among L1 Thai learners (McDonough & Mackey, 2008). Specifically, there is an apparent lack of studies investigating the acquisition of English dative constructions by L1 Thai learners using a structural priming methodological paradigm. Therefore, the current study aimed to fill in the gap by examining whether structural priming can cause learning of English dative constructions which were challenging for L1 Thai learners to process and investigating whether any learning effects that can possibly be observed were of implicit learning process or explicit memory process.

2.6 Summary

In this chapter, the notion of structural priming in language production was discussed (e.g., Bock, 1986; Pickering & Ferreira, 2008). Based on the structural priming methodological paradigm, it was assumed that, when learners had previously heard and repeated a particular structure, they were likely to reuse that structure in their subsequent production.

The four factors affecting the structural priming effects including the level of language proficiency, frequency of the target structure, cumulation of prime sentences and lexical overlap were also discussed.

The three views on structural priming effects in language production were also introduced. One view assumed that the priming effects occurred as a result of short-term activation of a certain word and its related structures (Pickering & Branigan, 1998). Researchers of another view argued that the priming effects were consequence of long-term implicit learning of a syntactic structure (e.g., Bock & Griffin, 2000; Chang et al., 2006)Proponents of the other view posited that the priming effects were driven by both short-term residual activation and long-term implicit learning. (e.g., Chang et al., 2006; Hartsuiker et al., 2008; Shin & Christianson, 2012).

Dative constructions in English and Thai were also explored. It was postulated that the dative constructions in Thai can be used to express one semantically related event in two syntactic constructions like those in English, but it differs from those of English in terms of order of arguments in the DO construction.

Research studies on the acquisition of L2 English dative constructions and structural priming in L2 acquisition were illustrated. It was shown why this thesis is working on structural priming in English dative construction production.

The next chapter describes the methodology of the study.

CHAPTER 3

METHODOLOGY

This chapter describes the methodology of the study. Section 3.1 presents participants. Section 3.2 presents research instruments. Section 3.3 shows procedure, followed by coding and analyses in 3.4. Section 3.5 shows the conclusion of the chapter.

3.1 Participants

L1 Thai learners with the intermediate English proficiency level were recruited through online posters 'Call for Research Participants' (See Appendix A). Their language proficiency level was determined based on Chulalongkorn University Test of English Proficiency[7] (CU-TEP) scores. Those whose scores in the range between 35- 69 was considered in the intermediate level. The mean score of the participants included in the experiment was 51.75. All the participants were required to complete an online 1-page questionnaire. The questionnaire was intended to collect data on their educational background and available time slots (See Appendix B). Then, they were asked to take a Comprehension Checking Task. Ninety participants who scored correctly more than 80% of the target test items were chosen to take part

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[7] The CU-TEP is a test of English language proficiency required for Chulalongkorn University's undergraduate and graduate students. The test contains 120 test items divided into three parts: listening, reading and writing (See the score range and classification of the English proficiency levels in Appendix C).

in the experiment because they were assumed to understand dative constructions in English.

At the time of the experiment, the participants were undergraduate students from mixed majors and academic years at Chulalongkorn University (See details of the L1 Thai learner participants in Appendix C). Their ages range was 17-20. They did not have any experience living in an English-speaking country and had not studied in an English program or an international school where English was the primary medium of instruction.

These ninety participants were randomly categorized into three different priming conditions groups: long-lag priming group (n= 30), short-lag priming group (n= 30) and no-lag priming group (n= 30). The dative production data from the participant groups could be compared to examine whether different priming conditions had different learning effects on the participants' production of English dative constructions after the structural priming experiments. All the participants were paid 300 baht for having participated in the experiment. Those who did not score correctly more than 80% of the target test items in the Comprehension Checking Task were also paid 150 baht for having taken the test.

3.2 Research Instruments

This section provides information on research instruments. Section 3.2.1 provides information on Comprehension Checking Task, followed by Preference Assessment Task in 3.2.2, Priming Task in 3.2.3 and Post-priming Picture Description Tasks in 3.2.4, respectively. Section 3.2.5 presents task validity.

3.2.1 Comprehension Checking Task

The first step of the production process for the Comprehension Checking Task was to identify the level of dative verbs to be used for task production. A comparison was made between the CU-TEP score and the Common European Framework of Reference (CEFR). It was assumed that intermediate participants were equivalent to B1, so the target dative verbs were chosen based on the B1 level vocabulary word lists of the English Vocabulary Profile[8], which was based on CEFR (Cambridge University Press, 2015). In addition, the target dative verbs were also selected based on the research conducted by the National Institute of Educational Testing Service (2012)[9] and their frequencies of occurrences in the Corpus of Contemporary American English (COCA). All of the selected dative verbs and their frequencies of occurrences are illustrated in Table 2:

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[8] The English Vocabulary Profile (Cambridge University Press, 2015) consists of English vocabulary words which are known and used by English language learners at each level of the CEFR. The word are collected from the Cambridge Learner Corpus (CLC), the Cambridge English Corpus and other sources such as classroom materials, examination vocabulary lists and course books.

[9] The research conducted by the National Institute for Educational Testing Service of Thailand (2012) contains English vocabulary lists which are compulsory for grades 1-12 Thai students. The words are based on 15 English textbooks for Thai students.

Table 2

The list of dative verbs in English used for target test items in the Comprehension

Checking Task

English Dative Verbs	Corpus Frequency (COCA)
give	1,048,189
show	538,889
read	386,137
send	256,309
teach	169,673
throw	152,388

Six English dative verbs including 'give', 'send', 'read', 'throw', 'teach' and 'show' were chosen to elicit English dative construction production. The chosen verbs can be used interchangeably in two syntactic constructions, i.e. the To-dative construction and the DO construction. One major reason for this was to examine whether the participants described the pictures using the target structure or the alternate structure. It is worth noting that, in English, there are two types of PO constructions, i.e. the for-dative construction and the to-dative construction. However, the PO construction under investigation in this study was the to-dative construction. Thus, the term 'PO construction' in this study refers to 'to-dative construction'. Since all of the participants had already completed their compulsory education, they were assumed to have knowledge of the chosen verbs, as the selected verbs were from grades 1-12 English textbooks, which were mandatory for Thai students. In addition, the frequency of each verb in the Corpus of Contemporary American English (COCA) was taken into consideration. Since the chosen verbs were the most six frequently

used in the COCA, it was assumed that participant would be familiar with the chosen verbs.

The Comprehension Checking Task was designed to ensure the participants' knowledge of the English dative constructions under investigation: PO construction and DO construction (See Appendix D). In total, there were 20 multiple-choice test items, consisting of 6 target test items and 14 distractors. Different syntactic constructions such as relative clause construction, passive construction, comparative construction, conditional construction and causative construction were used in distractor items so that the participants would not be aware of the target structures. The target test items and the distractors were presented in random order.

In this task, the participants were required to examine whether each item corresponded to the sentences given, as shown below in (1):

(1)   a   **Somsak threw the shirt to his friend in the crowd.**

        What can be inferred from the statement above?

        a. The shirt was thrown by Somsak's friend in the crowd.

        b. Somsak did not throw his friend in the crowd the shirt.

        c. Somsak threw his friend in the crowd the shirt.

        d. Somsak's friend threw the shirt in the crowd.

    b   **The teacher always read students a short story about science.**

What can be inferred from the statement above?

    a. The teacher never read students a short story about science.

    b. The teacher always read a short story about science to students.

    c. A short story about science was read by students to the teacher.

    d. Students read the teacher a short story about science.

In (1a), the sentence 'Somsak threw the shirt to his friend in the crowd' was written in the PO construction form, while in (1b), the sentence 'The teacher always read students a short story about science' was written in the DO construction form. In each item, the participants were required to read each sentence carefully and circle the correct answer. The score was determined by the correctness of their answers. Each item was worth one point. The participants who scored lower than 80% of target test items (i.e. at least four correct test items) were excluded from the study as it was assumed that they lacked knowledge of English dative constructions. To make the variables constant, the test items were in the past tense. Moreover, since there were six target dative verbs used in this task, three verbs including 'throw', 'teach', and 'show' were chosen to appear in the PO construction, while the other three including 'give', 'sent' and 'read' appeared in the DO construction.

3.2.2 Preference Assessment Task (Pre-test)

The Preference Assessment Task (Pre-test) was to determine the degree of preference of each dative construction type among the participants before receiving structural priming treatment (See Appendix E). The dative verbs in this task were the same verbs used in the Comprehension Checking Task. The total number of test items was 20 test items, consisting of 6 target test items and 14 distractors. Six target test items contained a pair of PO sentence and DO sentence to test which dative construction type was preferred. Various grammatical features such as synonyms, transitions, gerunds, adjectives and infinitives were used in distractor items so that the participants would not be aware of the target structures. For this task, the participants were required to choose a dative phrase they preferred, as shown in 2:

(2)   a   **My sister had sent_____ last month because there were a few job positions available.**

a. many international companies her resume

b. her resume to many international companies

        b   **Ms. Sumalee has been teaching_____ at an international school in Bangkok for three years.**

a. foreign students the Thai language

b. the Thai language to foreign students

In (2a), the dative verb 'sent' requires a direct object and an indirect object. In choice (a), the indirect object 'many international companies' — the R-argument precedes the direct object 'her resume' — a T-argument. Such a phrase is called a DO phrase. In choice (b), the direct object 'her resume' — the T-argument precedes the prepositional phrase 'to many international companies' — the R-argument. Such a phrase is called a PO phrase. In (2b), the dative verb 'teaching' requires a direct object and an indirect object. In choice (a), the indirect object 'foreign students' — the R-argument precedes the direct object 'the Thai language' — a T-argument. In choice (b), the direct object 'the Thai language' — the T-argument precedes the prepositional phrase 'to foreign students' — the R-argument. In each item, there was a gap in the sentence to be filled with a dative phrase that the participants preferred.

3.2.3 Priming Task

The Priming Task was adapted from Shin and Christianson's (2012) computer-delivered picture description task. The task was designed to examine whether structural priming improved L1 Thai learner participants' production of the English dative constructions (See Appendix F). In total, there were 20 sets of picture descriptions, consisting of 6 experimental priming sets and 14 distractors. Several distractors were made up using different syntactic constructions such as the relative clause construction, the passive construction and the separated-phrasal verb construction so that the participants would not aware of the experimental priming sets. The six experimental priming sets were used in three different priming conditions, i.e. the long-lag condition, the short-

lag condition and the no-lag condition. The six experimental priming sets were equally divided into two groups in accordance with two types of English dative constructions: three sets for PO construction and three sets for DO construction. This was intended to test whether PO construction or DO construction was used more by the participants after receiving the structural priming experiment.

Each experimental priming set contained prime picture descriptions, intervening picture descriptions and one target picture. Since the priming effects were assumed to increase with the number of prime sentences (e.g., Jaeger & Snider, 2007; Kaschak, 2006), three prime picture descriptions were made up. The three dative prime sentences were created with the same verbs in order to increase the priming effects (e.g., Hartsuiker et al., 2008; Shin & Christianson, 2012). Nevertheless, if the verb was used in a prime sentence, it was never used in the target pictures across the entire experiment. One major reason for this was to decrease the participants' guessing the descriptions from the similar sentence structures. The prime picture stimuli were made up and labelled with a dative verb. Six English dative verbs including 'feed', 'sell', 'bring', 'write', 'take' and 'tell' were chosen to create the prime sentences. All of the selected dative verbs for the prime sentences are illustrated in Table 3:

Table 3

The list of dative verbs in English used for the prime sentences in the Priming Task

English Dative Verbs	Corpus Frequency (COCA)
take	1,768,822
tell	1,116,692
write	439,865
bring	439,445
sell	198,982
feed	178,280

The dative verbs for prime sentences were selected based on the same criteria as the dative verbs for target pictures. Three dative verbs including. 'feed', 'sell', and 'bring' were chosen to appear in the DO construction, while the other three including 'write', 'take' and 'tell' appeared in the PO construction.

To make the variables constant, all prime sentences were written in the present continuous tense and controlled for the number of syllables; that is, the number of syllables in each prime sentence ranged from 7 to 11. Moreover, the agents in all the prime pictures were located on the right side. Figures 2 and 3 are examples of prime picture descriptions for PO and DO constructions:

Figure 2

Example of prime picture description for PO construction

write
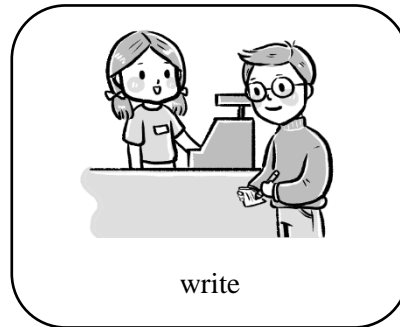
"The man is writing a note to the cashier."

Figure 3

Example of prime picture description for DO Construction
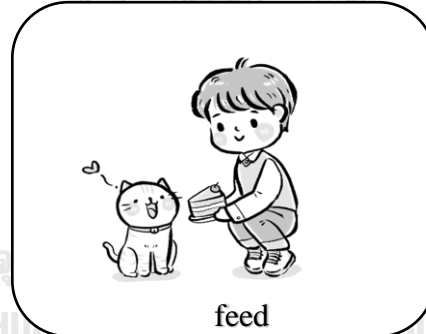
feed

"The boy is feeding his cat a piece of cake."

In addition to the prime picture descriptions, there were also intervening picture descriptions in short-lag priming set and long-lag priming set. The intervening picture descriptions were inserted between the prime picture descriptions and the target pictures so that the participants would not draw upon the prime sentences to describe the target pictures. The intervening sentences

were written in various syntactic forms such as passive form and present continuous form, but not dative form. Similar to the prime sentences, all the intervening sentences were controlled for the number of syllables; that is, the number of syllables in each sentence ranged from 7 to 11. The cartoon pictures stimuli for each sentence were made up. These cartoon pictures provided an illustration of an animate agent performing a transitive action involving either an inanimate patient, such as the man moving the chair (human agent / inanimate patient) and the girl eating noodles (human agent / inanimate patient). Figures 4 and 5 are examples of intervening picture descriptions

Figure 4

Example of intervening picture description

eat

"The girl is eating noodles."

Figure 5

Example of intervening picture description
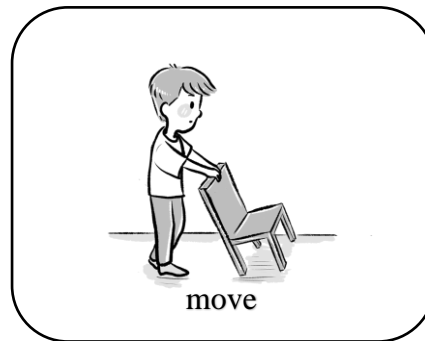
"The man is moving the chair."

Six target pictures were made up to elicit dative constructions. The pictures provided an illustration of an animate agent performing an action involving a possessive transfer to an animate patient such as the girl giving a book to the man (human agent / animate patient) and the man throwing a ball to the girl (human agent / animate patient). Each illustration was provided with a dative verb, which the participants used to generate a sentence. To make the variables constant, the agents in the target pictures were located on the right side in three pictures and on the left in the other three. The target pictures were illustrated in Figures 6- 11.

Figure 6

Picture 1 of the target pictures

"The girl is giving the man a book."

(Expected dative sentence)

Figure 7

Picture 2 of the target pictures

"The man is teaching Chinese to the girl"

(Expected dative sentence)

Figure 8

Picture 3 of the target pictures

"The man is sending the girl a postcard."

(Expected dative sentence)

Figure 9

Picture 4 of the target pictures

"The man is throwing a ball to the girl."

(Expected dative sentence)

Figure 10

Picture 5 of the target pictures
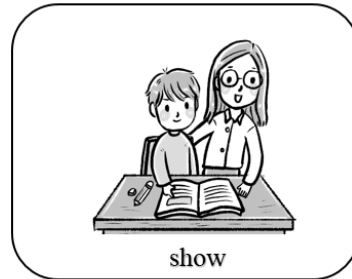
"The man is showing the teacher his homework."

(Expected dative sentence)

Figure 11

Picture 6 of the target pictures
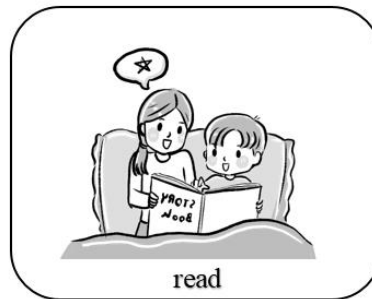
"The girl is reading a story to her son."

(Expected dative sentence)

Since the dative verbs 'give', 'send' and 'show' were chosen for the target picture of the DO prime picture descriptions, the DO sentences were expected for these verbs. Similarly, the PO sentences were expected for the dative verbs 'teach', 'throw' and 'read' because the verbs were chosen for the target picture of the PO prime picture descriptions.

Three priming conditions were created to explore the issue of whether the priming effects were due to implicit learning process or explicit memory process. These conditions included the long-lag condition, the short-lag condition and the no-lag condition. The three lag conditions were created by manipulating the order of the sentences and pictures in order to vary the number of intervening sentences between the prime and the target pictures. In each priming condition, there were six experimental priming sets, consisting of three PO priming sets and three DO priming sets. However, all priming conditions shared the same set of pictures and sentences.

In the long-lag condition, the prime sentences and the target pictures were not adjacent. That is, there were five intervening picture descriptions between the prime sentences and the target picture. In this study, the term 'intervening picture descriptions' refers to 'fillers between the prime sentences and target pictures'. This priming condition was assumed to involve implicit learning process, owing to the fact that the priming manipulation was so covert that the participants were unaware of the prime picture descriptions. If the long-lag condition was due to implicit learning of a syntactic structure, the priming effects would persist over five intervening sentences (e.g., Bock & Griffin, 2000; Chang et al., 2006). That is, the participants would to produce more of the PO sentences following PO prime sentences, and more of the DO sentences following DO prime sentences. Moreover, they were expected to show an increase in their production of English dative constructions over time. Each set of long-lag priming condition contained 9 picture descriptions, consisting of 3 prime picture descriptions, 5 intervening picture descriptions and 1 target

picture. Example of long-lag priming condition for PO and DO constructions are shown in Table 4:

Table 4

Example of long-lag priming condition for PO and DO constructions

Priming Conditions	DO priming set	PO priming set
Long-lag	*The boy is feeding his cat a piece of cake.* *The girl is feeding the bird a piece of cookie.* *The girl is feeding the bird a piece of cookie.* **The house is being decorated by the boy.** **The girl is eating noodles.** **The man is going to hit the snake.** **The boy cannot climb the tree.** **The boy cannot climb the tree.** ***The girl is giving the boy a book.***	*The boy is writing a letter to his mother.* *The man is writing a note to the cashier.* *The man is writing a note to the cashier.* **The girl is playing the piano.** **The man is moving the chair.** **The deer is being chased by the tiger.** **The girl is sweeping the room.** **The girl is sweeping the room.** ***The man is teaching Chinese to the girl.***

As shown in Table 4, the prime sentences were in italics, while the expected dative sentences were in bold italics. The intervening picture descriptions were in bold.

For the short-lag condition, three intervening picture descriptions were inserted between the prime sentences and the target picture. In each set of short-lag priming condition, there were 7 picture descriptions, consisting of 3 prime picture descriptions, 5 intervening picture descriptions and 1 target picture. Similar to the long-lag condition, the short-lag priming condition was assumed to involve implicit learning process because the priming manipulation was so covert that the participants were unaware of the prime picture descriptions. If the short-lag condition was due to implicit learning of a syntactic structure, the

priming effects would persist over five intervening sentences (e.g., Bock & Griffin, 2000; Chang et al., 2006). That is, the participants would to produce more of the PO sentences following PO prime sentences, and more of the DO sentences following DO prime sentences. In addition, they were expected to show an increase in their production of English dative constructions over time. Example of short-lag priming condition for PO and DO constructions are illustrated in Table 5:

Table 5

Example of short-lag priming condition for PO and DO constructions

Priming Conditions	DO priming set	PO priming set
Short-lag	*The boy is feeding his cat a piece of cake.* *The girl is feeding the bird a piece of cookie.* *The girl is feeding the bird a piece of cookie.* **The house is being decorated by the boy.** **The girl is eating noodles.** **The girl is eating noodles.** *The girl is giving the boy a book.*	*The boy is writing a letter to his mother.* *The man is writing a note to the cashier.* *The man is writing a note to the cashier.* **The girl is playing the piano.** **The man is moving the chair.** **The man is moving the chair.** ***The man is teaching Chinese to the girl***

As presented in Table 5, the prime sentences were in italics, while the expected dative sentences were in bold italics. The intervening picture descriptions were in bold.

In the no-lag condition, no intervening picture description appeared between the prime sentences and target picture. This condition was assumed to reflect explicit memory process, owing to the fact that the prime manipulation was so overt that it became a retrieval cue that enabled the participants to use

their explicit memory to recall and then reuse the structure in the prime sentences. If the no-lag condition involved explicit memory process, the priming effects would not persist over time (Pickering & Branigan, 1998). That is, the participants would produce fewer PO sentences following PO prime sentences, and fewer DO sentences following DO prime sentences. Moreover, they were expected to show a decrease in their production of English dative constructions over time. It is worth noting that the number of sentences and pictures were exactly the same as in the long-lag condition. Example of no-lag priming condition for PO and DO constructions are illustrated in Table 6:

Table 6

Example of no-lag priming condition for PO and DO constructions

Priming Conditions	DO priming set	PO priming set
No-lag	**The house is being decorated by the boy.**	**The girl is playing the piano.**
	The girl is eating noodles.	**The man is moving the chair.**
	The man is going to hit the snake.	**The deer is being chased by the tiger.**
	The boy cannot climb the tree.	**The girl is sweeping the room.**
	The boy cannot climb the tree.	**The girl is sweeping the room.**
	The boy is feeding his cat a piece of cake.	*The boy is writing a letter to his mother.*
	The girl is feeding the bird a piece of cookie.	*The man is writing a note to the cashier.*
	The girl is feeding the bird a piece of cookie.	*The man is writing a note to the cashier.*
	The girl is giving the boy a book.	***The man is teaching Chinese to the girl.***

As shown in Table 6, the prime sentences were in italics, while the expected dative sentences were in bold italics. The intervening picture descriptions were in bold.

For the priming task, the participants were required to listen to spoken sentences and look at the pictures presented in a continuous list when they saw the headphone icon. Then, they were asked to repeat what they had heard when they saw the same pictures with red frames and the microphone icon. Finally, when they saw the pictures with read frames without spoken sentences, they were required to describe that picture using the verb presented below the picture. The priming session was self-paced and lasted 40 minutes, slightly varying by the individual. Due to the COVID situation, the experiment was carried out online by means of E-conference through Zoom Clouds Meetings. All priming materials were presented via E-priming 3.0 software[10]. All the verbal responses from three testing conditions were recorded and transcribed by the researcher. One example of short-lag priming set for DO construction is illustrated in Figure 12.

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[10] E-Prime 3.0 is a program for behavioral research. It can run the experiments, collect the data and do some data analysis.

Figure 12

Example of no-lag priming set for DO construction

Filler 1 decorate	🎧	"The house is being decorated by the boy."
Filler 2 eat	🎧	"The girl is eating noodles."
Filler 3 hit	🎧	"The man is going to the snake."
Filler 4 climb	🎧	"The boy cannot climb the tree."
Repeat Filler 4 climb	🎤	"The boy cannot climb the tree."
Prime 1 feed	🎧	"The boy is feeding his cat a piece of cake."
Prime 2 feed	🎧	"The girl is feeding the bird a cookie."
Repeat prime 2 feed	🎤	"The girl is feeding the bird a cookie."
Target picture give	🎤	_____

3.2.4 Immediate Post-priming Picture Description Task (Immediate Post-test)

The Post-Priming Picture Description Task (Immediate Post-test) was intended to examine whether structural priming contributed to the short-term or long-term learning effects on the participants' use of English dative constructions. (See Appendix G). In total, there were 20 pictures consisting of 6 target pictures and 14 distractors. Different pictures were used as distractors so that the participants would not be aware of the target pictures. For the post-test, the participants were required to describe the pictures orally by using the dative verbs below the pictures to generate sentences. The target pictures in the Post-test are illustrated in Figures 13-18.

Figure 13

Picture 1 of the target picture

Figure 14

Picture 2 of the target picture

teach
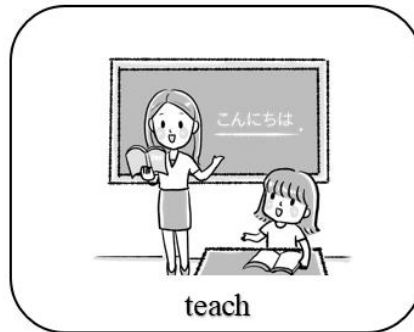
Figure 15

Picture 3 of the target picture

send

Figure 16

Picture 4 of the target picture

throw
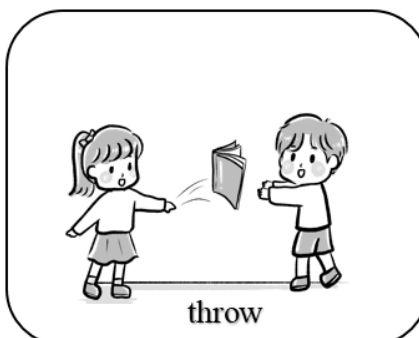
Figure 17

Picture 5 of the target picture

read
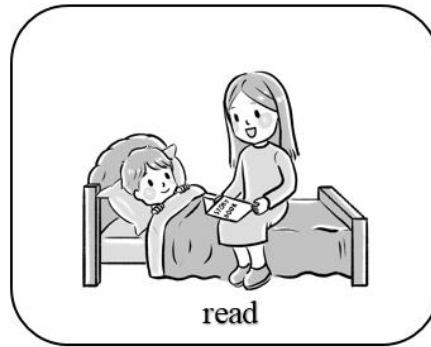
Figure 18

Picture 6 of the target picture
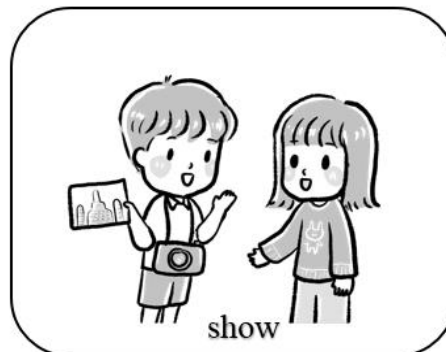
show

Six target pictures were made up to elicit dative constructions after the structural priming experiment. The dative verbs chosen for the post-test were the same verbs employed in the Priming Task, but the pictures were different so that the participants could not guess descriptions from the pictures they had seen. All the pictures provided an illustration of an animate agent performing an action involving a possessive transfer to an animate patient such as the boy showing a picture to the girl (human agent / inanimate patient). Each illustration

was labelled with a dative verb, which participants used to generate a sentence. To make the variables constant, the agents in the target pictures were on the right side in three pictures and on the left in the other three, in order to prevent the participants from fostering smooth production by a specific side of the pictures.

The posttest was self-paced. The experiment was carried out online by means of E-conference through Zoom Clouds Meetings. All the materials were presented via E-priming 3.0 software. The posttest lasted approximately 15 minutes, slightly varying by the individuals. All verbal responses were recorded and transcribed by the researcher.

3.2.5 Task Validity

The four tasks were validated by three highly experienced linguists for appropriateness through the Index of Item-Objective Congruence (IOC) (Rovinelli & Hambleton, 1976). These three experts were English language lecturers at the Faculty of Arts, Chulalongkorn University. The IOC scores were determined based on the criteria presented in Table 7:

Table 7

Scoring criteria for the Index of Item-Objective Congruence (IOC)

Scoring	Criteria
1	The test item was considered congruent with the task objectives.
0	The test item was considered congruent or incongruent with the task objectives.
-1	The test item was considered incongruent with the task objectives.

The IOC scores were calculated, using the formula below:

$$IOC = \frac{\Sigma R}{N}$$

ΣR: Total number of the experts' scores

N: The number of experts

The score for each test item in each task must be higher than 0.5 in order to be compatible with the objectives of the tasks. All of the test items used in the study passed the IOC, with rates of 0.945 for the Comprehension Checking Task, 1 for the Preference Assessment Task, the Priming Task and the Post-Priming Picture Description Task (See Appendix H).

3.3 Procedure

Before the experiment began, the participants were informed of the directions for the four tasks. There were three main sessions. In the first session, the participants were asked to perform the Comprehension Checking Task in no more than 30 minutes. Three days later in the second session, those who scored more than 80% of the target items in the Comprehension Checking Task were randomly assigned into three different priming condition groups: the long-lag group (n = 30), the short-lag

group (n = 30) and the no-lag group (n = 30). Then, they were asked to take the Preference Assessment Task in no more than 30 minutes. However, the researcher did not tell the participants this process so that they would not be aware of the conditions they were assigned.

In the following week, in the third session, the participants were asked to carry out twenty sets of structural priming materials in no more than 50 minutes followed by the Immediate Post-Test in no more than 15 minutes with a 20-minute break between the two tasks. Each participant group received a different priming experiment in accordance with the priming conditions.

Due to the COVID-19 situation, the data were collected online from the individual participants by means of E-conference through Zoom Clouds Meetings. The researcher received permission from the participants to make recordings of the data production. Table 8 illustrates an overview of the timeline of the experiments.

Table 8

Overview of the timeline of the experiments

Week	Session	Task(s)
1	1st	Comprehension Checking Task
		(30 minutes)
	2nd	Preference Assessment Task
	(five days after the first session)	(Pre-test)
		(30 minutes)
2		Priming Task
	3rd	(50 minutes)
	(10 minutes break	Immediate Picture-Description Task
	between the two tasks)	(Immediate Post-test)
		(15 minutes)

The research methodology was approved by the Office of the Research Ethics Review Committee for Research Involving Human Subjects: the Second Allied Academic Group in Social Sciences, Humanities and Fine and Applied Arts, Chulalongkorn University (COA No. 133/2564, Date of Approval: 14 June 2021).

3.4 Coding/Analyses

3.4.1 Comprehension Checking Task

The score was determined by the correctness of the target test items. Each item was worth one point. A correct answer received one point, whereas an incorrect answer or an unanswered item received a zero. The total score for the comprehension checking task was six. The correct answers were calculated in the form of percentages, using the formula below:

$$\frac{N \times 100}{T}$$

N: Number of correct answers for PO sentence and DO sentence

T: Total number from multiplying number of correct answers for PO sentence and DO sentence

3.4.2 Preference Assessment Task

The number of dative sentences in each construction type (i.e. DO construction and PO construction) produced by all the participants from each participant group was accumulated and calculated, using the formula below:

$$\frac{N \times 100}{T}$$

N: Number of dative sentences in each construction type

T: Total number from multiplying number of dative sentences in each construction type of participants in each participant group

Then, the type-separated raw scores for PO sentences and DO sentences by all participants from each participant group were compared and reported in the form of percentages to examine the preference of each English dative construction type before receiving the structural priming experiment.

3.4.3 Priming Task

As far as coding and analyses of the data from the Priming Task is concerned, the first step was to transcribe the audio-recordings. The next step in the analyses was to identify the sentence structure to determine whether the expected sentence structure was produced. Based on the previous research (e.g., Bock, 1986; Branigan, 2007), when a DO prime sentence was repeated, a DO sentence was expected. Similarly, when a PO sentence was repeated, a PO sentence was anticipated. If the sentences produced were in the same construction as in the prime sentences (PO or DO constructions), it was coded as 'target'. This could be inferred that the magnitude of structural priming effects is large. If the sentences produced were different from the construction in the prime sentences, it was coded as 'alternate'. This could suggest that the structural priming effects were not observed. Sentences whose structures were

not according to the expectation (i.e. the PO construction instead of the DO construction, or vice versa) were excluded from the data.

The sentences were coded as 'target' for PO construction if they had an agent in the subject position followed by a dative verb phrase consisting of a theme, the preposition 'to' and a recipient. Similarly, the sentences were coded as 'target' for DO construction if they had an agent in the subject position followed by a dative verb phrase consisting of a recipient and a theme. Sentences that did not conform to this syntactic descriptions were excluded from the data.   Any morphological errors such as tense and number were ignored. The score criteria for the priming task was presented in Table 9:

Table 9

Scoring criteria for the Priming Task

English Dative Constructions	Scoring	Criteria
Prepositional To-dative (PO)	target	[Agent – Dative verb – Theme – to Recipient]
Double-object dative (DO)	target	[Agent – Dative verb – Recipient –Theme]

The number of dative sentences in each construction type produced by all the participants from each participant group was accumulated and calculated, using the formula below:

$$\frac{N \times 100}{T}$$

N: Number of dative sentences in each construction type

T: Total number from multiplying number of dative sentences in each construction type of the participants from each participant group

Then, the type-separated scores for PO sentences and DO sentences by all the participants from each participant group were compared and reported in the form of raw scores and percentages to examine the use of each English dative construction type during the structural priming experiment. The percentage of each dative construction type by all the participants in each participant group was then put in the SPSS program for further statistical analysis (a dependent *t*-test method) to determine whether there was a statistical significance of the participants' production of dative constructions in the Preference Assessment Task and the Priming Task.

3.4.4 Immediate Post-Priming Picture Description Task

The first step was to transcribe the audio-recordings. The sentences were coded as PO sentence if they had an agent in the subject position followed by a dative verb phrase consisting of a theme, the preposition 'to' and a recipient. Similarly, the sentences were coded as DO sentence if they had an agent in the subject position followed by a dative verb phrase consisting of a recipient and a theme. Sentences that did not conform to this syntactic descriptions were excluded from the data. Any morphological errors such as tense and number were ignored.

The number of dative sentences in each construction type by the participants in each participant group was accumulated. Then, the type-separated scores for PO sentences and DO sentences by all the participants from each participant group was added up and calculated, using the formula below:

$$\frac{N \times 100}{T}$$

N: Number of dative sentences in each construction type

T: Total number from multiplying number of dative sentences in each construction type of the participants in each participant group

Then, mean scores and percentages of on each dative construction type from each participant group were put in the SPSS program for further statistical analysis to determine whether there was a statistical significance of the participants' production of dative constructions in the Preference Assessment Task and the Immediate Post-Priming Picture Description. The statistical method employed was a dependent t-test (or a paired samples t-test).

3.5 Summary

The chapter has presented the methodology of the study. It has been shown that the participants of the study were 90 L1 Thai learners of English selected on the basis of their English proficiency. These ninety participants were randomly categorized into three different priming conditions groups: long-lag priming group (n= 30), short-lag priming group (n= 30) and no-lag priming group (n= 30).

There were four instruments used to collect the data in this study: the Comprehension Checking Task, the Preference Assessment Task, the Priming Task and the Post-priming Picture Description Tasks. It has been shown that the four instruments were validated by three highly experienced linguists for appropriateness

through the Index of Item-Objective Congruence (IOC) (Rovinelli & Hambleton, 1976).

The data were collected online from the individual participants by means of E-conference through Zoom Clouds Meetings. There were three main sessions. In the first session, the participants were asked to perform the Comprehension Checking Task. Three days later in the second session, they were asked to take the Preference Assessment Task. In the following week, in the third session, the participants were asked to carry out twenty sets of structural priming materials, followed by the Immediate Post-Test.

The statistical method employed in this study was a dependent t-test (or a paired samples t-test).

The next chapter presents the results of the study and discusses the findings.

CHAPTER 4

RESULTS AND DISCUSSIONS

This chapter presents the results of the study and discusses the findings. Section 4.1 presents the results of the Comprehension Checking Task. Section 4.2 discusses the results of the Preference Assessment Task, followed by those of the Priming Task in 4.3. Section 4.4 provides the results from the Immediate Post-Priming Picture Description Task. Section 4.5 presents the conclusion of the chapter.

4.1 Results of the Comprehension Checking Task

This section presents the results obtained from the Comprehension Checking Task. Raw scores and percentages on the correct use of English dative constructions of each participant group were shown in Table 10:

Table 10

Raw scores and percentages on the correct use of the English dative constructions of each participant group in the Comprehension Checking Task

Priming condition groups	Raw scores	Percentages
No lag (n = 30)	176/180	98%
Short lag (n = 30)	179/180	99.44%
Long lag (n = 30)	180/180	100%

The data in Table 10 showed that the correct use of English dative constructions by all the participant groups was higher than the 80% criterion (176 or 98% for the no-lag group, 179 or 99.44% for the short-lag group and 180 or 100% for

the long-lag group). This could suggest that all the learners in each participant group had knowledge of English dative constructions.

4.2 Results of the Preference Assessment Task

This section presents the results obtained from the Preference Assessment Task. Mean scores and percentages on DO and PO sentences of each participant group were shown in Table 11 and Figure 20, respectively.

Table 11

Mean scores and percentages on DO and PO sentences of each participant group in the Preference Assessment Task

Preference Assessment Task						
Priming condition	**DO sentences**			**PO sentences**		
groups	*%*	*M*	*SD*	*%*	*M*	*SD*
No lag (n = 30)	22.22	1.33	0.60	77.77	4.66	0.60
Short lag (n = 30)	22.77	1.50	1.22	77.22	4.63	1.03
Long lag (n = 30)	23.88	1.43	1.27	76.11	4.56	1.27

Figure 19

Percentages on DO and PO sentences of each participant group in the Preference

Assessment Task
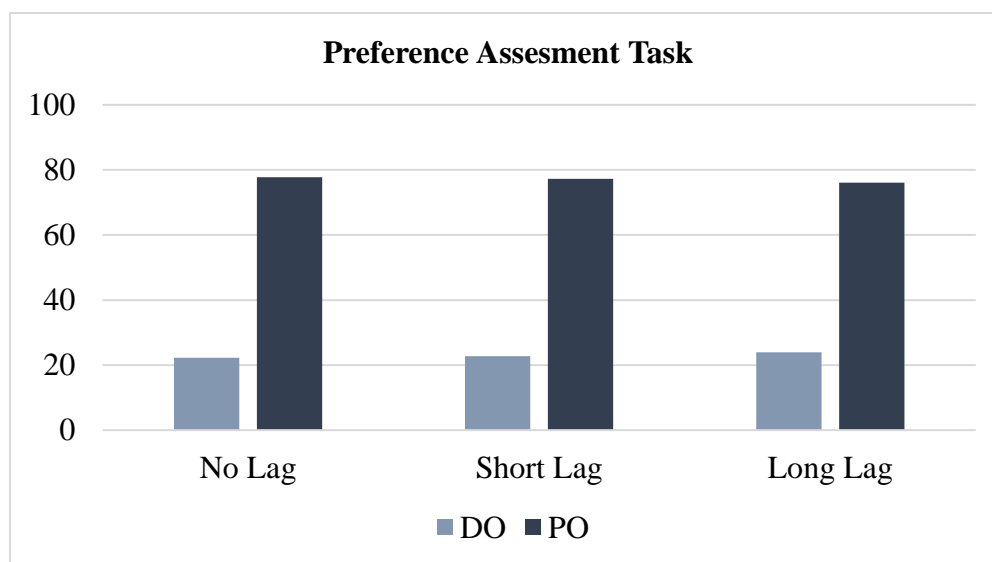
As illustrated in Table 11 and Figure 19, the no-lag group was found to use PO sentences ($M = 4.66$, $SD = 0.60$) rather than DO sentences ($M = 1.33$, $SD = 0.60$). In a similar trend, the short-lag group preferred PO sentences ($M = 4.63$, $SD = 1.03$) to DO sentences ($M = 1.50$, $SD = 1.22$). The long-lag group preferred the PO sentences ($M = 4.56$, $SD = 1.27$) to the DO sentences ($M = 1.43$, $SD = 1.27$). The findings suggested that the PO construction was preferred over the DO construction by the learners in all groups.

As the findings above showed, the learners' preference for the PO construction over the DO construction was assumed to be due to similarities and differences between their L1 Thai and L2 English, i.e. positive and negative transfer, respectively. That is, while the arguments in the English PO construction appear in the same word order as those in the Thai PO construction, the arguments in the English DO

construction appear differently from those in the Thai DO construction (See Section 2.3). The results suggested that the L1 Thai learners were likely to find that the DO construction was more complicated than the PO one. To use the English DO construction, the learners have to consider the argument positions which appear differently from those in the Thai DO construction. Thus, information processing in producing the DO construction is possibly higher than that in producing the PO construction. This is why the L1 Thai learners of English were shown to prefer the PO construction. The results were in line with Chang (2004), Hamdan (1994), Inagaki (1997), Pongyoo (2017) and Whong-Barr and Schwartz (2002), which found that L2 learners of English were more capable with the PO construction than the DO construction because the former construction is less cognitively complex than the latter one. Another reason why the L1 Thai learners preferred the PO construction over the DO construction was possibly because the PO construction is less marked and more salient than the DO construction, which is more marked and less salient (See Section 2.2). Thus, the L1 Thai learners tended to acquire the PO construction more easily than the DO construction.

4.3 Results of the Priming Task

This section presents the results obtained from the Priming Task. Raw scores and percentages on PO and DO sentence production of each participant group were shown in Table 12.

Table 12

Raw scores and percentages on PO and DO sentence production of each participant group in the Priming Task

	Priming Task							
	Target (DO)		**Alternate (PO)**		**Target (PO)**		**Alternate (DO)**	
Priming condition groups	Raw scores (90)	Percentages	Raw scores (90)	Percentages	Raw scores (90)	Percentages	Raw scores (90)	Percentages
No lag (n= 30)	48	53.33	42	46.66	57	63.33	33	36.66
Short lag (n= 30)	57	63.33	33	36.66	52	57.77	38	42.22
Long lag (n= 30)	44	48.88	46	51.11	55	61.11	35	38.88

The data in Table 12 showed that the no-lag group was shown to produce the target DO sentences (53.33%) more than the alternate PO sentences (46.66 %). Similarly, the short-lag group produced the target DO sentences (63.33%) more than the alternate PO sentences (36.66%). Nevertheless, the long-lag group produced the alternate PO sentences at 51.11%, a little higher than 48.88% for the target DO sentences.

In a similar trend, the no-lag group was found to produce more target PO sentences (63.33%) than alternate DO sentences (36.66 %). Similarly, the short-lag group produced the target PO sentences (57.77%) more than the alternate DO sentences (42.22%). The long-lag group produced the target PO sentences (61.11%) more than the alternate DO sentences (38.88%). The findings suggested that, after a series of structural priming experiments, the learners in all groups produced more of the DO sentences following DO prime sentences, and more of PO sentences following PO prime sentences, thus showing evidence of structural priming effects.

To determine whether the L1 Thai learners produced English dative constructions, both the DO construction and the PO construction, at higher rates after the structural priming experiments, mean scores and percentages of PO and DO sentence productions from the Preference Assessment Task and the Priming Task were compared. Table 13 compares performance on PO and DO sentence production in the Preference Assessment Task and the Priming Task.

Table 13

Mean scores and percentages on PO and DO sentence production of each participant group from the Preference Assessment Task and the Priming Task

Priming condition groups	Tasks		*%*	*M*	*SD*
No lag (n= 30)	Preference Assessment Task	DO	22.22	1.33	0.60
	Priming Task	DO	45	2.70	0.59
	Preference Assessment Task	PO	77.77	4.66	0.60
	Priming Task	PO	55	3.30	0.59
Short lag (n= 30)	Preference Assessment Task	DO	22.77	1.50	1.22
	Priming Task	DO	52.77	3.16	0.87
	Preference Assessment Task	PO	77.22	4.63	1.03
	Priming Task	PO	47.22	2.83	0.87
Long lag (n= 30)	Preference Assessment Task	DO	23.88	1.43	1.27
	Priming Task	DO	43.88	2.63	0.99
	Preference Assessment Task	PO	76.11	4.56	1.27
	Priming Task	PO	56.11	3.36	0.99

According to the results of the descriptive statistics in Table 13, the no-lag group had higher production of the DO sentences in the Priming Task (M = 2.70, SD = 0.59) than in the Preference Assessment Task (M = 1.33, SD = 0.60). Similarly, the short-lag group produced more of the DO sentences in the Priming Task (M = 3.16,

SD = 0.87) than they did in the Preference Assessment Task (*M* = 1.50, *SD* = 1.22).

The long-lag group had higher production of the DO sentences in the Priming Task

(*M* = 2.63, *SD* = 0.99) than in the Preference Assessment Task (*M* = 1.43, *SD* = 1.27).

The findings indicated that the learners in all groups showed an increase in their

production of the DO sentences after receiving the structural priming experiment.

In contrast, the no-lag group produced more of the PO sentences in the

Preference Assessment Task (*M* = 4.66, *SD* = 0.60) than in the Priming Task (*M* =

3.30, *SD* = 0.59). Similarly, the short-lag group had higher production of the PO

sentences in the Preference Assessment Task (*M* = 4.63, *SD* = 1.03) than they did in

the Priming Task (*M* = 2.83, SD = 0.87). The long-lag group produced more of the

PO sentences in the Preference Assessment Task (*M* = 4.56, *SD* = 1.27) than in the

Priming Task (*M* = 3.36, *SD* = 0.99). The findings suggested that the learners in all

the groups showed a decrease in their production of the PO sentences after receiving

the structural priming experiment.

A paired-samples t-test was carried out to compare the participants'

production of the PO sentences and the DO sentences in the Preference Assessment

Task and the Priming Task.

Table 14 shows paired-samples t-test results for DO sentence production of

each participant group from the Preference Assessment Task and the Priming Task.

Table 14

Paired-sample t-test results for DO sentence production of each participant group

from the Preference Assessment Task and the Priming Task

Priming condition groups	Paired Differences					*t*	*df*	*Sig. (2-tailed)*
	Mean	*Std. Deviation*	*Std. Error Mean*	*95% Confidence Interval of the Difference*				
				Lower	*Upper*			
No lag (n= 30)	-1.36	0.76	0.13	-1.65	-1.08	-9.78	29	.000
Short lag (n= 30)	-1.66	1.49	0.27	-2.22	-1.10	-6.11	29	.000
Long lag (n= 30)	-1.20	1.66	0.30	-1.82	-0.57	-3.93	29	.000

Results from a paired-samples t-test showed that, after receiving the structural priming experiment, the no-lag group showed a significant increase in producing the DO sentences ($t = -9.78$, $p < 0.05$). Similarly, the short-lag group showed a significant increase in their production of the DO sentences ($t = -6.11$, $p < 0.05$). The long-lag group showed a significant increase in their production of the DO sentences ($t = -3.93$, $p < 0.05$). The findings therefore suggested that the learners in all groups showed a significant increase in their production of the DO sentences after receiving the structural priming experiment.

Table 15 shows paired-samples t-test results for PO sentence production of each participant group from the Preference Assessment Task and the Priming Task.

Table 15

Paired-samples t-test results for PO sentence production of each participant group

from the Preference Assessment Task and the Priming Task

Priming condition groups	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
No lag (n= 30)	1.36	0.76	0.13	1.08	1.65	1.65	29	.000
Short lag (n= 30)	1.80	1.42	0.25	1.26	2.33	6.92	29	.000
Long lag (n= 30)	1.20	1.66	0.30	0.57	1.82	3.93	29	.000

Results from a paired-samples t-test showed that, after receiving the structural priming experiment, the no-lag group showed a significant decrease in their production of PO sentences ($t = 1.65$, $p < 0.05$). Similarly, the short-lag group showed a significant decrease in their production of the PO sentences ($t = 6.92$, $p < 0.05$), and long-lag group showed a significant decrease in producing the PO sentences ($t = 3.93$, $p < 0.05$). The findings therefore suggested that, after receiving the structural priming experiment, the learners in all groups showed a significant decrease in their production of the PO sentences.

A robust effect of structural priming on English dative constructions was observed across the participant groups. That is, the learners in all groups were found to produce more of the DO sentences following DO prime sentences, and more of the PO sentences following PO prime sentences. This suggests that structural priming could improve the L1 Thai learners' production of the English dative constructions. The findings seemed to lend support to Levelt's (1989) speech production model in that, when learners heard and repeated certain syntactic structure, they would store

abstract syntactic representations for that structure, which become activated and facilitate subsequent production of the same syntactic structure. The results, therefore, confirmed the first hypothesis in that the L1 Thai learners produced more the English dative constructions, both the PO construction and the DO construction after receiving the structural priming experiment[11]. The results were in line with some of the previous studies (e.g., Biria & Ameri-Golestan, 2010; Hurtado & Montrul, 2021; Jiang & Huang, 2015; McDonough, 2006; McDonough & Kim, 2016; McDonough & Mackey, 2008; Shin, 2010; Shin & Christianson, 2012), where structural priming improved L2 learners' production of the L2 structures which were difficult for the learners to process.

Despite the overall increase in production rates of the English dative constructions, the L1 Thai learners showed different rates of dative production. That is, the learners' production of the PO sentences was lower than that of the DO sentences in the Priming Task. This could be inferred that the structural priming effects were stronger for the DO construction than the PO construction. Such a phenomenon is called 'an inverse-frequency effect'. That is, a low-frequency structure was assumed to cause greater priming effects than a high-frequency one. Initial baseline measurements showed that the PO sentences were more favored than the DO sentences. It is possible, then, to state that, while the PO construction was considered

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[11] Evidence of L1 influence had been found. It was found that some L1 Thai learners produced some DO sentences with inaccurate order of arguments (e.g., '*the man is showing his homework the teacher.' and '* the man is sending a postcard the girl'). The inaccurate order of the arguments in the DO sentences by the learners in the Priming Task could be due to L1 negative transfer. That is, while Thai allows the theme-recipient order in the DO construction, English does not. Therefore, it is likely that some L1 Thai learners may draw upon their L1 knowledge to produce the English DO sentences. This is why the L1 Thai leaners erroneously produced the English DO sentences in the Priming Task.

a high-frequency structure, the DO construction was considered a low-frequency structure. As mentioned in 2.1.2.2, this phenomenon involves implicit learning mechanism. That is, to produce the DO sentences, the L1 Thai learners had to consider the argument positions which appear differently from those in the Thai DO construction. This could be assumed that the English DO construction had complicated semantic and morphological rules required for the online production. If their productions were wrong, the learners had to adjust their productions to be more accurate several times. Such adjustments showed how linguistic patterns in language were learnt implicitly and how those patterns were mapped onto meaning. This is why the priming effects were stronger with the DO construction than the PO construction. The results were consistent with some of the previous studies (e.g., Chang et al., 2006; Hartsuiker & Westenberg, 2000; Pickering & Ferreira, 2008; Yu & Zhang, 2020) in that, while the low-frequency structure was assumed to trigger greater learning effect, the high-frequency one caused less learning effect.

4.4 Results of the Immediate Post-Picture Description Task

This section presents the results obtained from the Immediate Post-Picture Description Task. Mean scores and percentages on DO and PO sentence production of each participant group are shown in Table 16 and Figure 21, respectively.

Table 16

Mean scores and percentages on DO and PO sentence production of each participant group in the Immediate Post-Picture Description Task

Immediate Post-Picture Description Task						
Priming condition groups	**DO construction**			**PO construction**		
	%	*M*	*SD*	*%*	*M*	*SD*
No lag (n= 30)	48.33	2.90	0.54	51.66	3.10	0.54
Short lag (n= 30)	50.55	3.03	0.80	49.44	2.96	0.80
Long lag (n= 30)	46.11	2.76	0.62	54.88	3.23	0.62

Figure 20

Percentages on DO and PO sentence production of each participant group in the Immediate Post-Picture Description Task
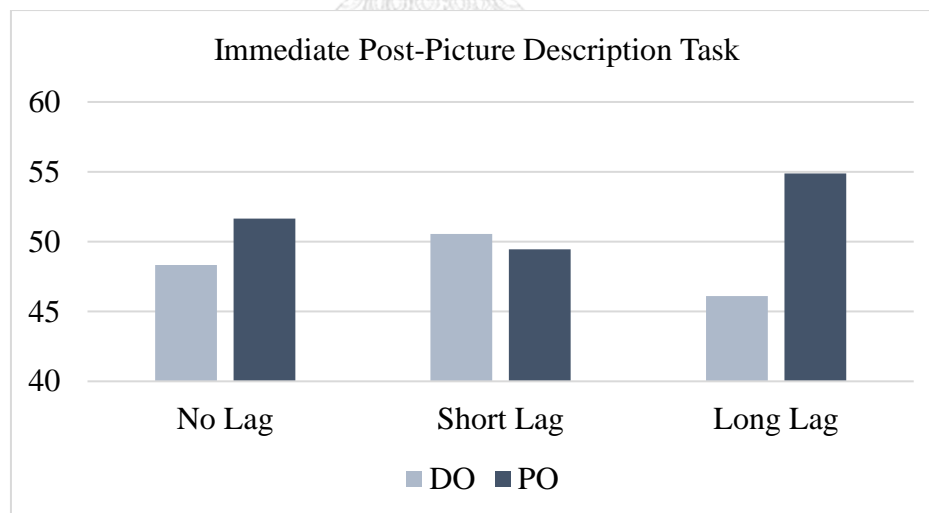
As shown in Table 16 and Figure 20, the no-lag group had slightly higher production of the PO sentences (*M* = 3.10, *SD* = 0.54) than the DO sentences (*M* = 2.90, *SD* = 0.54). The long-lag group produced the PO sentences (*M* = 3.23, *SD* =

0.62) more than the DO sentences (M = 2.76, SD = 0.62). However, the short-lag group had a little higher production of the DO sentences (M = 3.03, SD = 0.80) than the PO sentences (M = 2.96, SD = 0.80). Therefore, the findings suggested that, while the no-lag group and the long-lag group used more of the PO sentences to describe the target pictures in the Immediate Post-Picture Description Task, the short-lag group was found to use more of the DO one, although the PO and DO production rates were actually very close.

To determine whether different priming conditions had different learning effects on the L1 Thai learners' use of English dative constructions, mean scores and percentages of PO and DO sentence productions from the Preference Assessment Task and the Immediate Post-Picture Description Task were compared.

Results of the Preference Assessment Task, compared with those of the Immediate Post-Picture Description Task, are presented in Table 17.

Table 17

Mean scores and percentages on PO and DO sentence production of each participant

group from the Preference Assessment Task and the Post-Picture Description Task

Priming condition groups	Tasks		%	*M*	*SD*
No lag (n= 30)	Preference Assessment Task	DO	22.22	1.33	0.60
	Immediate Post-Test	DO	48.33	2.90	0.54
	Preference Assessment Task	PO	77.77	4.66	0.60
	Immediate Post-Test	PO	51.66	3.10	0.54
Short lag (n= 30)	Preference Assessment Task	DO	22.77	1.50	1.22
	Immediate Post-Test	DO	50.55	3.03	0.80
	Preference Assessment Task	PO	77.22	4.63	1.03
	Immediate Post-Test	PO	49.44	2.96	0.80
Long lag (n= 30)	Preference Assessment Task	DO	23.88	1.43	1.27
	Immediate Post-Test	DO	46.11	2.76	0.62
	Preference Assessment Task	PO	76.11	4.56	1.27
	Immediate Post-Test	PO	54.88	3.23	0.62

The data in Table 17 showed that the no-lag group produced more of the DO sentences in the Immediate Post-Picture Description Task ($M = 2.90$, $SD = 0.54$) than in the Preference Assessment Task ($M = 1.33$, $SD = 0.60$). Similarly, the short-lag group had higher production of the DO sentences in the Immediate Post-Picture Description Task ($M = 3.03$, $SD = 0.80$) than they did in the Preference Assessment Task ($M = 1.50$, $SD = 1.22$), and the long-lag group produced more of the DO sentences in the Immediate Post-Picture Description Task ($M = 2.76$, $SD = 0.62$) than in the Preference Assessment Task ($M = 1.43$, $SD = 1.27$). The findings showed that the learners in all the groups showed an increase in their production of the DO sentences over time.

In contrast, the no-lag group had lower production of the PO sentences in the Immediate Post-Picture Description Task (M = 3.10, SD = 0.54) than in the Preference Assessment Task (M = 4.66, SD = 0.60). Similarly, the short-lag group produced less the PO sentences in the Immediate Post-Picture Description Task (M = 2.96, SD = 0.80) than in the Preference Assessment Task (M = 4.63, SD = 1.03), and the long-lag group had lower production of the PO sentences in the Immediate Post-Picture Description Task (M = 3.23, SD = 0.62) than in Preference Assessment Task (M = 4.56, SD = 1.27). The findings therefore indicated that the learners in all the groups showed a decrease in their production of the PO sentences over time.

A paired-samples t-test was conducted to compare the participants' production rates of the PO sentences and the DO sentences in the Preference Assessment Task and the Immediate Post-Picture Description Task.

Table 18 shows paired-samples t-test results for DO sentence production of each participant group from the Preference Assessment Task and the Immediate Post-Picture Description Task.

Table 18

Paired-sample t-test results for DO sentence production of each participant group from the Preference Assessment Task and the Immediate Post-Picture Description Task

Priming condition groups	Paired Differences					*t*	*df*	*Sig. (2-tailed)*
	Mean	*Std. Deviation*	*Std. Error Mean*	*95% Confidence Interval of the Difference*				
				Lower	*Upper*			
No lag (n= 30)	-1.56	0.85	0.15	-1.88	-1.24	-9.99	29	.000
Short lag (n= 30)	-1.53	1.45	0.26	-2.07	- 0.98	-5.76	29	.000
Long lag (n= 30)	-1.33	1.32	0.24	-1.82	- 0.83	-5.52	29	.000

Results from a paired-samples t-test showed that, after receiving the structural priming experiment, the no-lag group showed a significant increase in their production of the DO sentences ($t = -9.99$, $p < 0.05$). Similarly, the short-lag group showed a significant increase in producing the DO sentences ($t = - 5.76$, $p < 0.05$). The long-lag group showed a significant increase in their production of the DO sentences ($t = - 5.52$, $p < 0.05$). Therefore, the findings indicated that, ten minutes after the structural priming experiment, the learners in all groups showed a significant increase in their production of the DO sentences over time.

Table 19 shows paired-samples t-test results for PO sentence production of each participant group from the Preference Assessment Task and the Immediate Post-Picture Description Task.

Table 19

Paired-samples t-test results for PO sentence production of each participant group

from the Preference Assessment Task and the Immediate Post-Picture Description

Task

Priming condition groups	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
No lag (n= 30)	1.56	0.85	0.15	1.24	1.88	9.99	29	.000
Short lag (n= 30)	1.66	1.29	0.23	1.18	2.15	7.04	29	.000
Long lag (n= 30)	1.33	1.32	0.24	- 0.83	-1.82	-5.52	29	.000

Results from a paired-samples t-test showed that, after the structural priming experiments, the no-lag group showed a significant decrease in producing the PO sentences ($t = 9.99$, $p < 0.05$). Similarly, the short-lag group showed a significant decrease in their production of the PO sentences ($t = 7.04$, $p < 0.05$), and long-lag group showed a significant decrease in producing the PO sentences ($t = -5.52$, $p < 0.05$). The findings therefore indicated that, after the structural priming experiments, the learners in all the groups showed a significant decrease in their production of the PO sentences over time.

The paired-samples t-test results showed that L1 Thai learners showed different production rates of English dative constructions. That is, while production rates of the DO sentences in the Immediate Post-Picture Description Task were significantly higher than in the Preference Assessment Task, those of the PO sentences in the Immediate Post-Picture Description Task were significantly lower than in the Preference Assessment Task. This pattern was found with all the

participant groups. Concerning the learners' decrease rate of the PO sentence production, it was observed that, when the learners produced more of the DO sentences, they tended to produce fewer of the PO sentences in the Immediate Post-Picture Description Task. In other words, the more likely that the DO sentences were produced, they less likely that the PO sentences were produced. In this sense, when the production rates of the PO sentences in both tasks were compared, the rates of the PO sentence production in the Immediate Post-Picture Description Task seemed to be lower than in the Preference Assessment Task. Although the rates of the PO sentence production seemed to decrease over time, the structural priming effects were still observed in the learners' production of the PO construction. That is, the production rates of the DO and PO constructions were close to ceiling, which could suggest that the L1 Thai learners produced the English dative constructions at higher rates after receiving a series of structural priming experiments. It appeared that the structural priming effects observed were not simply conscious repetitions of structures because such an effect still persisted. If the structural priming effects had been from repetitions, different production rates of English dative constructions across the three priming condition groups may have been found. The findings, therefore, suggested that the structural priming helped promote long-term production of the English dative constructions among the L1 Thai learners.

Specifically, the magnitude of structural priming effects was not associated with having different numbers of intervening picture descriptions between the prime and target pictures. This is because the learners across the three priming condition groups showed similar beneficial effect on the improvement of DO sentences. Thus, the results did not confirm the second hypothesis because different priming conditions

did not have different learning effects on L1 Thai learners' production of English dative constructions after the structural priming experiments. If the structural priming effects had been associated with the number of intervening picture descriptions, similar production rates of dative sentences across the three priming condition groups may not have been found. The results could be explained by the Implicit Learning Account (Bock & Griffin, 2000) in that the structural priming was a form of implicit learning mechanism through error-based learning and meaning-form mappings. During the structural priming experiments, the learners tried to predict the upcoming sentences. If their predictions were wrong, the learners would adjust their predictions to be more accurate. Such adjustments showed how a syntactic structure was learned implicitly. Through this learning, the learners were assumed to able to produce the next sentences from a representation of a previously heard and produced syntactic structure. Another evidence supporting the implicit learning explanations was also found. It was found that the structural priming effects were very robust and persisted across several unrelated intervening sentences. That is, the learners were found to produce more of the PO sentences following PO prime sentences, and more of the DO sentences following DO prime sentences, although several intervening sentences were inserted between the prime and target pictures. Therefore, the knowledge that emerged from the structural priming experiments was assumed to reflect abstract and complex relationships between form and meaning of a syntactic structure that the learners were unable to explain. If structural priming was due to explicit memory process, the priming effects should have not been persistent across several intervening sentences. The results were in line with Hurtado and Montrul (2021), Jiang and

Huang (2015) and Shin and Christianson (2012), where structural priming effects were consequences of implicit learning mechanism.

4.5 Summary

This chapter presented the results of the study and discussed the findings. The results from the Comprehension Checking Task showed that the correct use of English dative constructions by all the participant groups was higher than the 80% criterion, suggesting that all the learners in each participant group had knowledge of English dative constructions.

The results from the Preference Assessment Task showed that the PO sentences were more favored than the DO sentences by the L1 Thai learners in all the groups. It was also shown that the learners' preference for the PO construction over the DO construction was assumed to be due to similarities and differences between their L1 Thai and L2 English, i.e. positive and negative transfer, respectively.

The findings from the Priming Task revealed that, after receiving the structural priming experiments, the L1 Thai learners in all the groups produced more of the DO sentences following DO prime sentences, and more of PO sentences following PO prime sentences, which showed evidence of structural priming effects. The results therefore confirmed the first hypothesis in that the L1 Thai learners produced more of the English dative constructions, both the DO and PO constructions at higher rates after receiving the structural priming experiments.

The data from the Immediate Post-Picture Description Task showed that the L1 Thai learners showed a significant increase in their production of the English DO and PO constructions over time. The findings suggested that the structural priming

can promote long-term production of the English dative constructions among the L1 Thai learners of English. It was also shown that the structural priming effects had not been associated with having different numbers of intervening picture descriptions between the prime and target pictures. Thus, the results did not confirm the second hypothesis because the different priming conditions did not have different learning effects on L1 Thai learners' production of English dative constructions after the structural priming experiments. It appeared that the Implicit Learning Account can account for higher production rates of the English dative constructions.

The thesis goes on to make conclusions and discuss implications of the findings from the study in the next chapter.
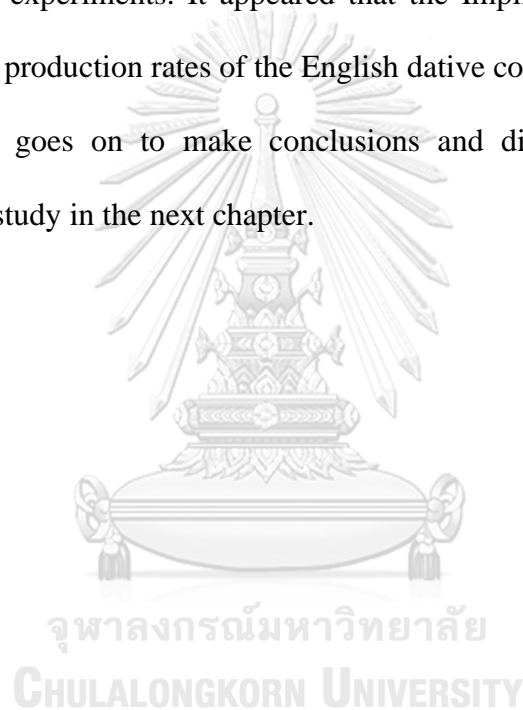
CHAPTER 5

CONCLUSIONS

This chapter is organized as follows. Section 5.1 summarizes the main findings of the study. Section 5.2 discusses theoretical and pedagogical implications of the study, respectively. Section 5.3 presents the limitations of the study and provides recommendation for future research.

5.1 Summary of the Main Findings

The study aimed at examining whether structural priming can facilitate L1 Thai learners' acquisition of English dative constructions, both the DO construction and the PO construction, and investigating whether different priming conditions have different learning effects on L1 Thai learners' acquisition of English dative constructions.

The first hypothesis stated that the L1 Thai learners of English produce English dative constructions, both DO construction and PO construction, at higher rates after receiving the structural priming experiments. However, the similar structure, i.e. the English PO construction is used more frequently than the different structure, i.e. the English DO construction. The second hypothesis stated that different priming conditions have different learning effects on L1 Thai learners' acquisition of English dative constructions. That is, less intervening sentences between prime and target sentences contribute to the short-term learning effects, whereas more intervening sentences between prime and target sentences mediate the long-term learning effects on L1 Thai learners' acquisition of English dative constructions.

The findings from the present study showed that the L1 Thai learners across the priming condition groups exhibited the structural priming effects. That is, the learners produced more of the DO sentences following DO prime sentences, and more of the PO sentences following PO prime sentences at higher rates. Thus, the first hypothesis was confirmed by the results. Moreover, the structural priming effects were found to be stronger with the PO construction than with the DO construction, perhaps owing to the fact that the low-frequency structure (i.e. the PO construction) caused greater learning effect, while the high-frequency one (i.e. the DO construction) triggered less learning effect.

The structural priming effects were found to be persistent over time. That is, the L1 Thai learners across the three priming condition groups showed a significant increase in their productions of the English dative constructions after a series of the structural priming experiments. This implies that structural priming can promote long-term production of the English dative constructions among the learners. However, such effects did not involve different numbers of intervening picture descriptions between the prime and target pictures. If the structural priming effects had been associated with the number of intervening picture descriptions, similar production rates of dative sentences across the three priming condition groups may not have been found. Therefore, the second hypothesis was not confirmed by the results.

The evidence from the study supports the explanation of the implicit learning mechanism. According to this explanation, structural priming is the result of implicit learning process of a certain syntactic structure. That is, through structural priming, the learners were assumed to learn to produce sentences from a representation of a previously heard and produced structure in prime sentences. Moreover, the structural

priming effects were very robust and persisted across several unrelated intervening sentences between the prime and target sentences. Thus, the knowledge that emerges from structural priming experiments is assumed to reflect abstract and complex relationships between form and meaning that learners are unconscious.

5.2 Implications of the study

Implications of the study are provided with respect to theoretical and pedagogical contributions regarding L2 acquisition.

5.2.1 Theoretical Implications

The present study supports the proposal that structural priming helps promote long-term production of L2 structures which are challenging for L2 learners to process. From the findings of the present study, initial baseline measurements showed that the English PO construction was preferred to the English DO construction. The data indicated that the L1 Thai learners found that the English DO construction was more difficult than the English PO construction. This could be due to similarities and differences of the dative constructions in Thai and English. Even though the English DO construction was a challenging structure, the L1 Thai learners showed a significant increase in their productions of the DO and PO constructions after receiving the structural priming experiments. This could suggest that structural priming seemed to have a cognitive function that helps reduce the learners' cognitive load in producing complex L2 structures. That is, through structural priming, it is easier for the learners to produce a syntactic structure that has been recently

encountered than to produce a completely new structure. Therefore, the knowledge that emerges from structural priming is assumed to reflect abstract and complex relationships between form and meaning that learners are unaware of and unable to explain, showing that structural priming is a form of implicit learning mechanism. Thus, structural priming seems to be a possible mechanism which helps promote L2 acquisition and development.

5.2.2 Pedagogical Implications

The findings of the present study suggest the following pedagogical implications:

Firstly, the data showed that the L1 Thai learners' production rates of English PO construction were significantly higher than those of the DO one in the Preference Assessment Task. The findings suggested that the L1 Thai learners of English seemed to have more difficulty in producing the English DO construction. The learners had to consider the argument positions which appear differently from those in the Thai DO construction. As a result of this difference, teachers are suggested to emphasize the English DO construction's usage. Emphasis could be made on the students' exposure to authentic materials involving the use of arguments in the English DO construction such as essay writing and gap-filling exercises to promote accuracy. However, since the arguments in the English PO construction appear in the same word order as those in the Thai PO construction, teachers may use communicative tasks such as think-pair-share activities and story-telling activities to enhance the students'

fluency in using the English PO construction. These tasks would help develop the L1 Thai learners' production of the English dative constructions.

Secondly, the data from the experiments showed that the L1 Thai learners of English showed a significant increase in their productions of English dative constructions after receiving the structural priming experiments. The findings suggested that the L1 Thai learners were assumed to learn the English dative constructions through structure priming. Thus, teachers are suggested to employ structural priming as a pedagogical strategy in teaching the target language because it helps facilitate teaching and learning and enables students to acquire a difficult structure more easily. For instance, in order to teach grammar rules, teachers may prime students with a target structure and then expect those students to use that structure in their language production. By a structural priming methodological paradigm, students are assumed to learn implicitly how to create their own structures by making use of the prime structures. Priming materials could be picture description activities and story-telling activities. Particularly, this could be an effective way to prepare students for structures with which they have difficulty.

5.3 Limitations and Suggestions for Future Research

In this section, three limitations are identified and recommendations are made:

Firstly, the participants in this study were intermediate L1 Thai learners. Future research can be conducted to examine structural priming effects on the use of dative constructions by comparing data from L2 learners of different proficiency

levels. If learners' language proficiency levels are different, results may reflect different magnitude of the structural priming effects.

Secondly, the present study focused on structural priming on the acquisition of English dative constructions by L1 Thai learners. Future research on other constructions which are non-existent in the Thai language but exist in English are recommended. This would yield more evidence for further understanding of the underlying mechanism of structural priming on L2 acquisition of syntactic structures.

Thirdly, the results yielded were based on a quantitative research approach. Future research can be conducted integrated with a qualitative method such as an interview, which could yield more evidence for the preference of the PO construction over the DO construction.

Lastly, the present study used the Immediate Post-Picture Description Task to investigate the issue of whether structural priming promoted long-term production of the English dative constructions. Further research could include a Delayed Post-Picture Description Task to gain a more complete view of long-term effects of structural priming on L2 acquisition.

Appendices

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Appendix A

Call for Research Participant Poster

Appendix B

แบบสมัครเข้าร่วมโครงการวิจัย "การอ่านและการพูดประโยคภาษาอังกฤษ"

ขอเรียนเชิญท่านเข้าร่วมเป็นส่วนหนึ่งของงานวิทยานิพนธ์ระดับปริญญาโท เรื่อง การรับรู้โครงสร้างภาษาอังกฤษของผู้เรียนชาวไทย โดยโครงการวิจัยนี้จัดทำขึ้นเพื่อศึกษาความเข้าใจประโยคภาษาอังกฤษของผู้เรียนชาวไทย ประโยชน์ที่คาดว่าจะได้รับจากงานวิจัยนี้คือใช้เป็นแนวทางในการจัดการเรียนการสอนโครงสร้างภาษาอังกฤษสำหรับผู้เรียนชาวไทย และมีนัยทางด้านภาษาศาสตร์ประยุกต์ที่เกี่ยวข้องกับการรับภาษาที่สอง

โดยผู้เข้าร่วมงานวิจัยจำเป็นจะต้องมีคุณสมบัติดังต่อไปนี้

1.) เป็นนิสิตระดับปริญญาตรีชาวไทยของจุฬาลงกรณ์มหาวิทยาลัยและเป็นผู้เรียนภาษาอังกฤษเป็นภาษาที่สอง

2.) มีคะแนน CU-TEP อยู่ระหว่าง 35-69 หรือ IELTS อยู่ระหว่าง 4.0-5.0

รายละเอียดการเข้าร่วมวิจัย

เมื่อผู้วิจัยตรวจสอบว่าท่านมีคุณสมบัติตรงกับเกณฑ์ทุกประการแล้ว ผู้วิจัยจะติดต่อท่านเพื่อชี้แจงรายละเอียดเกี่ยวกับโครงการวิจัย และข้อมูลสำคัญอื่นๆ ภายใน 1 สัปดาห์ โดยท่านที่มีคุณสมบัติตรงกับเกณฑ์ ผู้วิจัยจะขอให้ท่านทำแบบทดสอบทางช่องทางออนไลน์ ดังนี้

1.) แบบทดสอบความเข้าใจโครงสร้างประโยคภาษาอังกฤษ 1 ชุด โดยเป็นแบบทดสอบปรนัย 4 ตัวเลือก จำนวน 20 ข้อ ใช้เวลาทำประมาณ 30 นาที

2.) แบบทดสอบการเลือกใช้คำและโครงสร้างภาษาอังกฤษ 1 ชุด เป็นแบบทดสอบปรนัย 2 ตัวเลือก จำนวน 20 ข้อ ใช้เวลาทำประมาณ 30 นาที

3.) การทดสอบการรับรู้โครงสร้างภาษาอังกฤษซึ่งเป็นโปรแกรมสำเร็จรูป โดยท่านจะได้ดูภาพพร้อมฟังประโยคที่กำหนด จากนั้นให้บรรยายภาพที่กำหนด จำนวน 20 หน่วยทดสอบ ใช้เวลาทำประมาณ 50 นาที (มีการบันทึกเสียงระหว่างการทำแบบทดสอบ)

4.) การทดสอบบรรยายภาพจำนวน 20 ภาพ ใช้เวลาครั้งละ 5 นาที จำนวน 2 ครั้ง โดยครั้งที่ 2 จะนัดหมายจากครั้งแรกจำนวน 2 สัปดาห์ (มีการบันทึกเสียงระหว่างการทำแบบทดสอบ)

โดยผู้วิจัยจะขอให้ท่านทำแบบทดสอบความเข้าใจโครงสร้างประโยคภาษาอังกฤษ ในวันจันทร์ ที่ 5 กรกฎาคม 2564 เวลา 10.30-11.05 น. หากท่านทำแบบทดสอบนี้ได้ตามเกณฑ์ ผู้วิจัยจะติดต่อเพื่อขอให้ทำแบบทดสอบการเลือกใช้คำและโครงสร้างภาษาอังกฤษ ในวันจันทร์ที่ 12 กรกฎาคม 2564 เวลา 10.30 -11.05 น. และแบบทดสอบเพิ่มเติมอีก 2 ครั้ง ในวันและเวลาที่ท่านสะดวกรายบุคคล (สามารถระบุผ่านแบบสมัครเข้าร่วมโครงการวิจัย) ในกรณีที่ท่านไม่สะดวกทำแบบทดสอบความเข้าใจโครงสร้างประโยคภาษาอังกฤษและแบบทดสอบการเลือกใช้คำและโครงสร้างภาษาอังกฤษในวันและเวลาดังกล่าว ท่านสามารถแจ้งให้ผู้วิจัยทราบได้

โดยระบุวันและเวลาที่ท่านสะดวกผ่านแบบสมัครเข้าร่วมโครงการวิจัยเพื่อให้ผู้วิจัยติดต่อท่านมาทำแบบทดสอบ
รายบุคคล

    การวิจัยครั้งนี้ท่านจะไม่เสียค่าใช้จ่ายใด ๆ และจะได้รับค่าตอบแทน จำนวน 150-300 บาท การทำแบบทดสอบความเข้าใจโครงสร้างประโยคภาษาอังกฤษให้ค่าชดเชยการเสียเวลา 150 บาท การทดสอบครั้งต่อๆไป
ให้ค่าตอบแทน ครั้งละ 50 บาท

    การวิจัยครั้งนี้ผู้วิจัยจะดำเนินการเก็บข้อมูลผ่านโปรแกรมซูม ในระหว่างการเก็บข้อมูลท่านมีสิทธิ์ที่จะ
ไม่เปิดกล้อง และจะไม่มีการบันทึกการประชุมซูมใดใด ทั้งนี้ผู้วิจัยหลีกเลี่ยงการเก็บข้อมูลที่ทำให้ทราบตัวตน
ของท่าน ไม่มีการถามชื่อ สกุล และท่านสามารถเลือกใช้อีเมลที่ไม่บ่งบอกตัวตนของท่านได้ สำหรับแบบทดสอบ
ความเข้าใจโครงสร้างประโยคภาษาอังกฤษ ท่านสามารถขอดูผลคะแนนและเฉลยคำตอบได้เป็นรายบุคคลผ่าน
อีเมลของผู้วิจัย

    ข้อมูลที่ได้จากการวิจัยจากท่านจะถูกเก็บรักษาไว้ ไม่เปิดเผยต่อสาธารณะเป็นรายบุคคล แต่จะรายงาน
ผลการวิจัยเป็นภาพรวม ผู้ที่มีสิทธิ์เข้าถึงข้อมูลการวิจัยของท่านจะมีเฉพาะผู้ที่เกี่ยวข้องกับการวิจัยนี้ และ
คณะกรรมการจริยธรรมการวิจัยในคนเท่านั้น

ขอขอบคุณอย่างยิ่งที่ท่านสนใจเข้าร่วมงานวิจัยนี้

ข้อมูลนักวิจัย
นายจตุรพร คงบาง
นิสิตปริญญาโท สาขาภาษาอังกฤษ
คณะอักษรศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
Jatura_porn@yahoo.co.th

1. ท่านเป็นนิสิตระดับปริญญาตรีชาวไทยที่กำลังศึกษาอยู่ที่จุฬาลงกรณ์มหาวิทยาลัย หรือไม่?

   ☐ ใช่

   ☐ ไม่ใช่

2. ท่านเป็นผู้เรียนภาษาอังกฤษเป็นภาษาที่สอง หรือไม่?

   ☐ ใช่

   ☐ ไม่ใช่

3. ท่านมีคะแนน CU-TEP อยู่ระหว่าง 35-69 หรือ IELTS อยู่ระหว่าง 4.0-5.0 หรือไม่ ?

   ☐ ใช่

   ☐ ไม่ใช่

4. ท่านเป็นนิสิตที่กำลังศึกษาอยู่ในคณะใดของจุฬาลงกรณ์มหาวิทยาลัย ?

   _____

5. ผู้วิจัยสามารถติดต่อท่านเพื่อชี้แจงรายละเอียดเกี่ยวกับโครงการวิจัยผ่านช่องทางใดได้บ้าง โปรดระบุ เช่น อีเมล ไลน์ เป็นต้น

   _____

6. ท่านสะดวกทำแบบทดสอบความเข้าใจโครงสร้างประโยคภาษาอังกฤษทางออนไลน์ ในวันจันทร์ที่ 5 กรกฎาคม 2564 เวลา 10.30 -11.05 น. หรือไม่

   ☐ สะดวก

   ☐ ไม่สะดวก (โปรดระบุวันและเวลาที่ท่านสะดวก ก่อนวันที่ 12 กรกฎาคม 2564 _____)

7. ท่านสะดวกทำแบบทดสอบการเลือกใช้คำและโครงสร้างภาษาอังกฤษทางออนไลน์ ในวันจันทร์ที่ 12 กรกฎาคม 2564 เวลา 10.30 -11.05 น. หรือไม่

   ☐ สะดวก

   ☐ ไม่สะดวก (โปรดระบุวันและเวลาที่ท่านสะดวก หลังวันที่12 กรกฎาคม 2564 _____)

8. ท่านสะดวกทำแบบทดสอบการรับรู้โครงสร้างภาษาอังกฤษและการทดสอบบรรยายภาพครั้งที่ 1 ทางออนไลน์ (ใช้เวลารวมประมาณ 1 ชั่วโมง) ในวันและเวลาใด (หลังวันที่ 12 กรกฎาคม 2564) โปรดระบุ

   _____

9. ท่านสะดวกทำแบบทดสอบการบรรยายภาพทางออนไลน์ ครั้งที่ 2 (ใช้เวลาประมาณ 5 นาที) ในวันและเวลาใด (โปรดกำหนดวันห่างจากครั้งที่ 1 ในข้อ 8 เป็นเวลา 2 สัปดาห์) โปรดระบุ

   _____

Appendix C

Details of Participants

Participant	Age	Faculty	CU-TEP score	Proficiency
1	18	Education	38	
2	18	Arts	40	
3	18	Arts	46	
4	18	Arts	60	
5	18	Arts	36	
6	18	Arts	39	
7	18	Arts	45	
8	18	Education	41	
9	18	Arts	50	
10	18	Arts	53	
11	18	Arts	52	
12	18	Medicine	40	
13	18	Medicine	60	
14	18	Arts	65	
15	18	Arts	61	
16	18	Arts	41	Intermediate
17	20	Arts	60	
18	18	Education	60	
19	18	Science	68	
20	18	Arts	40	
21	18	Arts	42	
22	18	Arts	48	
23	19	Science	52	
24	18	Education	41	
25	18	Education	56	
26	18	Arts	64	
27	18	Arts	63	

Participant	Age	Faculty	CU-TEP score	Proficiency
28	18	Arts	41	
29	18	Arts	48	
30	18	Arts	39	
31	18	Arts	46	
32	20	Arts	50	
33	18	Arts	56	
34	18	Arts	49	
35	18	Arts	39	
36	18	Arts	38	
38	18	Arts	48	
39	18	Arts	59	
40	18	Medicine	67	
41	18	Engineering	62	
42	18	Arts	59	
43	18	Arts	48	
44	18	Arts	39	
45	21	Arts	37	
46	18	Arts	56	Intermediate
47	18	Arts	39	
48	18	Arts	56	
49	19	Arts	60	
50	19	Arts	57	
51	18	Arts	39	
52	18	Arts	56	
53	18	Arts	65	
54	18	Arts	67	
55	18	Arts	65	
56	18	Arts	39	
57	18	Arts	46	
58	18	Arts	56	

Participant	Age	Faculty	CU-TEP score	Proficiency
59	18	Education	60	
60	18	Arts	68	
61	18	Engineering	57	
62	18	Arts	39	
63	18	Arts	56	
64	18	Arts	58	
65	18	Arts	55	
66	18	Arts	60	
67	18	Arts	39	
68	19	Engineering	47	
69	20	Arts	48	
70	18	Arts	68	
71	18	Engineering	67	
72	18	Arts	52	Intermediate
73	18	Arts	36	
74	18	Education	39	
75	18	Arts	48	
76	18	Arts	37	
77	18	Medicine	59	
78	19	Arts	65	
79	18	Arts	52	
80	18	Education	45	
81	18	Arts	67	
82	18	Arts	53	
83	18	Arts	52	
84	18	Arts	42	
85	18	Arts	67	
86	18	Arts	63	
87	20	Arts	43	
88	18	Arts	55	

Participant	Age	Faculty	CU-TEP score	Proficiency
89	18	Medicine	36	
90	18	Engineering	65	

Appendix D

Comprehension Checking Task

FACULTY_____E-MAIL_____

Directions: There are twenty items, each of which has four choices: A, B, C, and D. For each item, circle the best answer. You have 30 minutes to complete this task.

---

1. The government of Thailand gave some money to many jobless people last year.

   What can be inferred from the statement above?

   a. The government of Thailand was given some money by many jobless people last year.

   b. Many jobless people gave the government of Thailand some money last year.

   c. The government of Thailand gave many jobless people some money last year.

   d. Some money was not given to jobless people by the government of Thailand last year.

2. *Any teachers wanting to attend the seminar* must inform the school early.

   What does the italicised phrase refer to?

   a. Any teachers who attend the seminar

   b. Any teachers who want to inform the school early

   c. Any teachers who want to attend the seminar

   d. Any teachers who inform the school early

3. *Airport officials taking care of arriving passengers* will have a meeting tonight.

   What does the italicised phrase refer to?

   a. Airport officials who take care of arriving passengers

   b. Airport officials who will have a meeting with arriving passengers

   c. Airport officials who take care of a meeting tonight

   d. Airport officials who are the arriving passengers

4. Somsri's mother never sent a message to her on Facebook Messenger.

   What can be inferred from the statement above?

   a. Somsri's mother sometimes sent her a message on Facebook Messenger.

   b. Somsri never sent her mother a message on Facebook Messenger.

   c. Somsri's mother never sent her a message on Facebook Messenger.

   d. A message was sent by Somsri to her mother on Facebook Messenger.

5. The telephone was invented by Alexander Graham Bell.

   What can be inferred from the statement above?

   a. Alexander Graham Bell did not invent the telephone.

   b. Alexander Graham Bell invented the telephone.

   c. Alexander Graham Bell was invented the telephone.

   d. The telephone was not invented by Alexander Graham Bell.

6. The teacher always read students a short story about science.

   What can be inferred from the statement above?

   a. The teacher never read students a short story about science.

   b. The teacher always read a short story about science to students.

   c. A short story about science was read by students to the teacher.

   d. Students read the teacher a short story about science.

7. It is widely believed that *some herbal plants can cure serious diseases.*

   What does the italicised part refer to?

   a. It is impossible that some herbal plants can cure serious diseases.

   b. Some herbal plants can be cured serious diseases.

   c. Serious diseases are widely believed to be cured.

   d. Serious diseases can be cured by some herbal plants.

8. If travelers had stayed home for a period of 14 days from the time they left an area
   with widespread of COVID-19, Rungnapha would not have gotten infected.

   What can be inferred from the statement above?

   a. Rungnapha was infected with COVID-19.

   b. Rungnapha was not infected with COVID-19.

   c. Travelers from an area with widespread of COVID-19 stayed home for 14
   days.

   d. Travelers from an area with widespread of COVID-19 were not infected.

9. If Sumalee had paid attention in class, she would have been ready for the quizzes.

   What can be inferred from the statement above?

   a. Sumalee paid attention in class, so she was ready for the quizzes.

   b. Sumalee was not ready for the quizzes because she did not pay attention in
   class.

   c. Sumalee paid attention in class, but she was not ready for the quizzes.

   d. Sumalee did not pay attention in class, but she was ready for the quizzes.

10. Somsak threw the shirt to his friend in the crowd.

    What can be inferred from the statement above?

    a. The shirt was thrown by Somsak's friend in the crowd.

    b. Somsak did not throw his friend in the crowd the shirt.

    c. Somsak threw his friend in the crowd the shirt.

    d. Somsak's friend threw the shirt in the crowd.

11. The information given to us by Sirirat was more accurate than the information
    given by Wattana.

    What can be inferred from the statement above?

    a. The information given by Sirirat to Wattana was more accurate.

    b. The information given by Wattana to Sirirat was more accurate.

    c. The information given by Wattana was not accurate.

    d. The information given by Wattana was less accurate.

12. The books in Cherry store are much more interesting than the books in the next store.

    What can be inferred from the statement above?

    a. The books in the next store are much more interesting.

    b. The books in Cherry store are less interesting than those in the next store.

    c. The books in Cherry store are not interesting.

    d. The books in the next store are less interesting than those in Cherry store.

13. Ms. Yi Feng had taught Chinese to many business people for many years.

    What can be inferred from the statement above?

    a. Ms. Yi Feng had taught many business people Chinese for many years.

    b. Chinese had been taught by many business people for many years.

    c. Many business people had taught Chinese to Ms. Yi Feng for many years.

    d. Ms. Yi Fang had not taught Chinese to many business people for many years.

14. Somsak and Pichay had their assignments checked.

    What can be inferred from the statement above?

    a. Somsak and Pichay had to check their assignments.

    b. Somsak and Pichay have checked their assignments themselves.

    c. Somsak and Pichay did not check their assignments themselves.

    d. Somsak had Pichay check their assignments.

15. Mr. Thomson showed the pictures of Mount Fuji to his mother.

    What can be inferred from the statement above?

    a. The pictures of Mount Fuji were shown by Mr. Thomson's mother.

    b. Mr. Thomson showed his mother the pictures of Mount Fuji.

    c. His mother showed the pictures of Mount Fuji to Mr. Thomson.

    d. Mr. Thomson did not show the pictures of Mount Fuji to his mother.

16. Jenjira got her house cleaned yesterday.

    What can be inferred from the statement above?

    a. Jenjira cleaned her house herself yesterday.

    b. Jenjira did not clean her house herself yesterday.

    c. The house was cleaned by Jenjira yesterday.

    d. Jenjira did not want to clean her house yesterday.

17. Dennapha just got a master's degree last year. Her parents want her to continue studying for a doctoral degree immediately, but she will have to *think over whether to study in the US or England.*

    What does the italicised phrase refer to?

    a. Dennapha will have to consider whether to study in the US or England.

    b. Dennapha will have to manage whether to study in the US or England.

    c. Dennapha will have to solve whether to study in the US or England.

    d. Dennapha will have to plan whether to study in the US or England.

18. Many people *foresee the need for cars that would be less polluting*.

    What does the italicised phrase refer to?

    a. Many people plan the need for cars that would be less polluting.

    b. Many people generalize the need for cars that would be less polluting.

    c. Many people mention the need for cars that would be less polluting.

    d. Many people anticipate the need for cars that would be less polluting.

19. The table is too heavy for Jatupon to lift.

    What can be inferred about Jatupon from the statement above?

    a. It is possible but difficult for Jatupon to lift the table.

    b. It is impossible for Jatupon to lift the table.

    c. Jatupon does not want to lift the table.

    d. Jatupon can lift the table.

20. Thanittha regretted giving some money to jobless people in rural areas.

What can be inferred about Thanittha from the statement above?

   a. Thanittha enjoyed giving some money to jobless people in rural areas.

   b. Thanittha would not give some money to jobless people in rural areas.

   c. Thanittha gave some money to jobless people in rural areas.

   d. Thanittha will give some money to jobless people in rural areas.

Appendix E

Preference Assessment Task

FACULTY_____E-MAIL_____

Directions: There are twenty items, each of which has two choices: A and B. For each item, circle the choice that your prefer. Please be noted that both choices are correct. You have 30 minutes to complete this task.

1. My sister had sent_____ last month because there were a few job positions available.
   a. many international companies her resume
   b. her resume to many international companies

2. The Royal Project_____helping hill-tribe people to improve their crops was founded by the King Rama IX in the early 1960s.
   a. focusing on
   b. which focuses on

3. Many experts have been discussing how to combat smog, _____ several Northern provinces of Thailand.
   a. hitting
   b. which has hit

4. Wat Phra Kaew or Wat Phra Si Rattana Satsadaram, the most sacred Buddhist temple in Thailand, was_____ in 1783 under the orders of King Rama I.
   a. constructed
   b. built

5. Mr. Somchai gave _____ this morning. The watch he gave was absolutely beautiful.

   a. his son a watch for his birthday

   b. a watch to his son for his birthday

6. Before the 1970s, language teachers had hardly_____ the communicative method.

   a. paid attention to

   b. focused on

7. With high GPAX, Jetsada_____ get a good job.

   a. should

   b. is supposed to

8. Ms. Sumalee has been teaching_____ at an international school in Bangkok for three years.

   a. foreign students the Thai language

   b. the Thai language to foreign students

9. When Sumalee retires, she _____find something to do so that she will not feel bored.

   a. must

   b. need to

10. Tsunami waves usually occur in the deep sea; _____, they are more powerful than normal waves.

   a. therefore

   b. hence

11. Jirapat studies very enthusiastically; _____, she does many extracurricular activities.
    a. moreover
    b. in addition

12. _____ a study, obese people may develop diabetes easily and have a great risk of heart diseases.
    a. According to
    b. Based on

13. _____ the serious problem of global warming, not many people seem to care about it.
    a. Despite
    b. In spite of

14. Everybody in Wichet's family loves _____ in the ocean.
    a. swimming
    b. to swim

15. Most parents read _____ every night at bedtime.
    a. their children a funny story
    b. a funny story to their children

16. _____ some money to jobless people in rural areas becomes Sudarat's priority.
    a. Giving
    b. To give

17. _____ of the furniture that is shown at the expo is very expensive.
    a. Most
    b. All

18. In Thai culture, children should show_____.

    a. their parents respect

    b. respect to their parents

19. _____valuable works of art in this house were created by Mr Thawan Dachanee who was a national artist of Thailand.

    c. Many

    d. Several

20. The boy threw_____.

    a. his girlfriend the snowballs

    b. the snowballs to his girlfriend
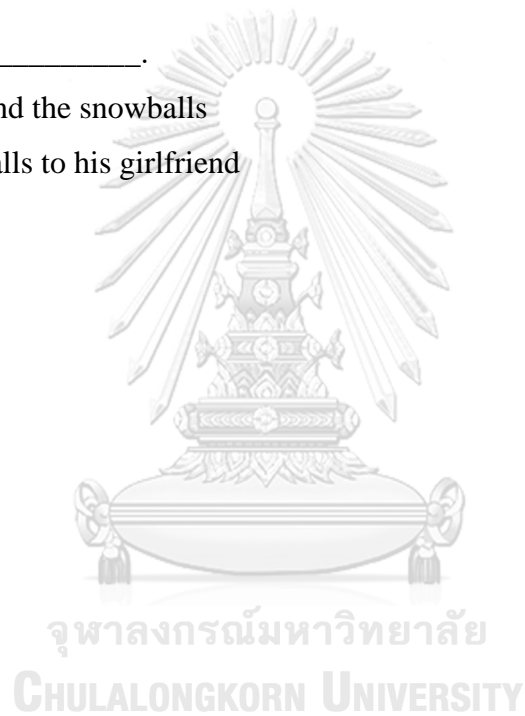
Appendix F

Priming Task

No-lag condition: set 1

Prime 1

🎧 *The boy is feeding his cat a piece of cake.*

Prime 2

🎧 *The girl is feeding the bird a piece of cookie.*

Repeated prime 2

🎤 *The girl is feeding the bird a piece of cookie.*

Target picture

🎤 -

feed

feed

feed

give

No-lag condition: set 2

Filler 1

watch

🎧 *The boy is watching television.*

Filler 2

drink

🎧 *The girl is drinking some coffee.*

Filler 3

clean

🎧 *The table is being cleaned by the man.*

Filler 4

dance

🎧 *The girl dances beautifully.*

Repeated filler 4

dance

🎤 *The girl dances beautifully.*

Prime 1 — *Somechai is selling the man his house.*

Prime 2 — *The man is selling the girl an ice-cream cone.*

Repeated prime 2 — *The man is selling the girl an ice-cream cone.*

Target picture — send

No-lag condition: set 3

Filler 1 — The girl is studying Chinese.
study

Filler 2 — The man is walking his dog.
walk

Filler 3 — The car is being washed by the man.
wash

Filler 4 — The man is painting the wall.
paint

Repeated filler 4 — The man is painting the wall.
paint

No-lag condition: set 4

Filler 1

play

🎧 *The girl is playing the piano.*

Filler 2

move

🎧 *The man is moving the chair.*

Filler 3

chase

🎧 *The deer is being chased by the tiger.*

Filler 4

sweep

🎧 *The girl is sweeping the room.*

Repeated filler 4

sweep

🎤 *The girl is sweeping the room.*

Prime 1 · 🎧 *The boy is writing a letter to his mother.*

Prime 2 · 🎧 *The man is writing a note to the cashier.*

Repeated prime 2 · 🎤 *The man is writing a note to the cashier.*

Target picture · 🎤 -

write

write

write

teach

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

No-lag condition: set 5

Filler 1

draw

🎧 *The girl is drawing a picture.*

Filler 2

get

🎧 *The girl is getting angry.*

Filler 3

drink

🎧 *The girl is drinking some milk.*

Filler 4

make

🎧 *The cake is made by the girl.*

Repeated filler 4

make

🎤 *The cake is made by the girl.*

Prime 1	🎧 *The man is taking the book to the teacher.*	
Prime 2	🎧 *The boy is taking a dress to the girl.*	
Repeated prime 2	🎤 *The boy is taking a dress to the girl.*	
Target picture	🎤 -	

No-lag condition: set 6

Filler 1	ride	The boy is riding a bicycle.
Filler 2	fix	The man cannot fix his car.
Filler 3	withdraw	The girl is withdraw some money.
Filler 4	plant	The man is planting a tree.
Repeated filler 4	plant	The man is planting a tree.

Prime 1 — The man is telling his experience to the girl.

Prime 2 — The girl is telling something to her mother.

Repeated prime 2 — The girl is telling something to her mother.

Target picture — -

CHULALONGKORN UNIVERSITY

Short-lag condition: set 1

Prime 1 — The boy is feeding his cat a piece of cake.

Prime 2 — The girl is feeding the bird a piece of cookie.

Repeat prime 2 — The girl is feeding the bird a piece of cookie.

Filler 1 — The house is being decorated by the boy.

Filler 2 — The girl is eating noodles.

Repeat filler 2

eat

The girl is eating noodles.

Target picture

give

Short-lag condition: set 2

Prime 1

🎧 *Somchai is selling the man his house.*

sell

Prime 2

🎧 *The man is selling the girl an icecream cone.*

sell

Repeat prime 2

🎤 *The man is selling the girl an icecream cone.*

sell

Filler 1

🎧 *The man is going to hit the snake.*

watch

Filler 2

🎧 *The girl is drinking some coffee.*

drink

Repeat filler 2

drink

The girl is drinking some coffee.

Target picture

give

- -

จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

Short-lag condition: set 3

Prime 1

bring

🎧 *The girl is bringing the boy a letter.*

Prime 2

bring

🎧 *The man is bringing the customer the bed.*

Repeat prime 2

bring

🎤 *The man is bringing the customer the bed.*

Filler 1
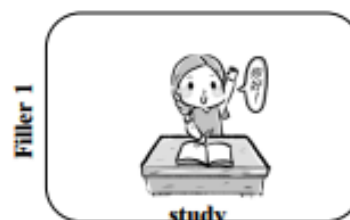
study

🎧 *The girl is studying Chinese.*

Filler 2

walk

🎧 *The man is walking his dog.*

Repeat filler 2

walk

The man is walking his dog.

Target picture

show

- -

จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

Short-lag condition: set 4

Prime 1
The boy is writing a letter to his mother.

Prime 2
The man is writing a note to the cashier.

Repeat prime 2
The man is writing a note to the cashier.

Filler 1
The girl is playing the piano.

Filler 2
The man is moving the chair.

The man is moving the chair.

Short-lag condition: set 5

Prime 1 — The man is taking a book to the teacher.

take

Prime 2 — The boy is taking a dress to the girl.

take

Repeat prime 2 — The boy is taking a dress to the girl.

take

Filler 1 — The girl is drawing a picture.

draw

Filler 2 — The boy is getting angry.

get

Repeat filler 2

get

The boy is getting angry.

Target picture

throw

_____

จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

Short-lag condition: set 6

Prime 1

🎧 *The man is telling his experience to the girl.*

tell

Prime 2

🎧 *The girl is telling something to her mother.*

tell

Repeat prime 2

🎤 *The girl is telling something to her mother.*

tell

Filler 1

🎧 *The boy is riding a bicycle.*

ride

Filler 2

🎧 *The man cannot fix his car.*

fix

Repeat filler 2

fix

The man cannot fix his car.

Target picture

read

Long-lag condition: set 1

Prime 1 — *The boy is feeding his cat a piece of cake.*

Prime 2 — *The girl is feeding the bird a piece of cookie.*

Repeat prime 2 — *The girl is feeding a piece of cookie.*

Filler 1 — *The house is being decorated by the boy.*

Filler 2 — *The girl is eating noodles.*

Filler 3 🎧 *The man is going to hit the snake.*

hit

Filler 4 🎧 *The boy cannot climb the tree.*

climb

Repeat filler 4 🎤 *The boy cannot climb the tree.*

climb

Target picture 🎤 -

give

Long-lag condition: set 2

Prime 1 sell — 🎧 *Somchai is selling the man his house.*

Prime 2 sell — 🎧 *The man is selling the girl an icecream cone.*

Repeat prime 2 sell — 🎤 *The man is selling the girl an icecream cone.*

Filler 1 watch — 🎧 *The boy is watching television.*

Filler 2 drink — 🎧 *The girl is drinking some coffee.*

Filler 3

clean

🎧 *The table is being cleaned by the man.*

Filler 4

dance

🎧 *The girl dances beautifully.*

Repeat filler 4

dance

🎤 *The girl dances beautifully.*

Target picture

send

🎤 -

Long-lag condition: set 3

Prime 1

🎧 *The girl is bringing the boy a letter.*

bring

Prime 2

🎧 *The man is bringing the customer the bed.*

bring

Repeat prime 2

🎤 *The boy is taking a dress to the girl.*

bring

Filler 1

🎧 *The girl is studying Chinese.*
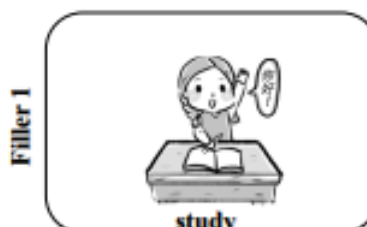
study

Filler 2

🎧 *The man is walking his dog.*

walk

Filler 3

wash

🎧 *The car is being washed by the man.*

Filler 4

paint

🎧 *The man is painting the wall.*

Repeat filler 4

paint

🎤 *The man is painting the wall.*

Target picture

show

🎤 -

Long-lag condition: set 4

Prime 1 · The boy is writing a letter to his mother.

write

Prime 2 · The man is writing a note to the cashier.

write

Repeat prime 2 · The man is writing a note to the cashier.

write

Filler 1 · The girl is playing the piano.

play

Filler 2 · The man is moving the chair.

move

Filler 3

🎧 *The deer is being chased by the tiger.*

get

Filler 4

🎧 *The girl is sweeping the room.*

sweep

Repeat filler 4

🎤 *The girl is sweeping the room.*

sweep

Target picture

🎤 -

teach

Long-lag condition: set 5

Prime 1

The man is taking a book to the teacher.

take

Prime 2

The boy is taking a dress to the girl.

take

Repeat prime 2

The boy is taking a dress to the girl.

take

Filler 1

The girl is drawing a picture.

draw

Filler 2

The boy is getting angry.

get

Filler 3 — drink — 🎧 *The girl is drinking some milk.*

Filler 4 — make — 🎧 *The cake is made by the girl.*

Repeat filler 4 — make — 🎤 *The cake is made by the girl.*

Target picture — throw — 🎤 -

Long-lag condition: set 6

Prime 1

🎧 *The man is telling his experience to the girl.*

Prime 2

🎧 *The girl is telling something to her mother.*

Repeat prime 2

🎙 *The girl is telling something to her mother.*

Filler 1

🎧 *The boy is riding a bicycle.*

Filler 2

🎧 *The man cannot fix his car.*

Filler 3

withdraw

🎧 *The girl is withdrawing some money.*

Filler 4

plant

🎧 *The man is planting a tree.*

Repeat filler 4

plant

🎤 *The man is planting a tree.*

Target picture

read

🎤 -

Appendix G

Post-Priming Picture Description Task

give

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throw

----

teach

----

read

----

show

----

send

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escape

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use

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chase _____

camp _____

do _____

have _____

crash

blow up

play

water

carve

sew

investigate

pick up
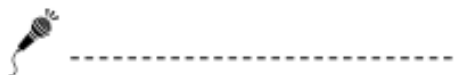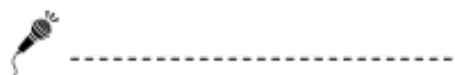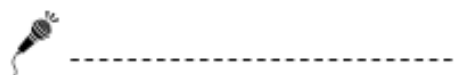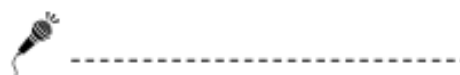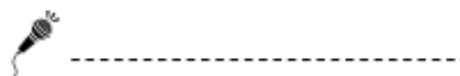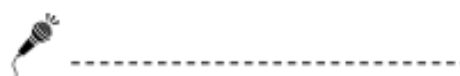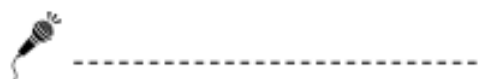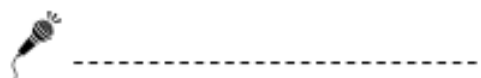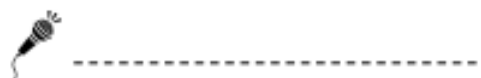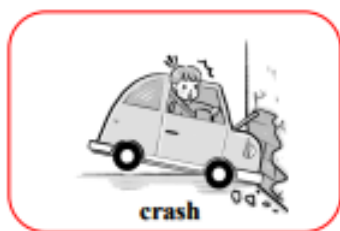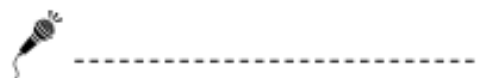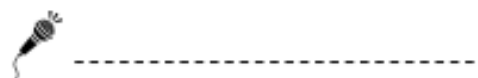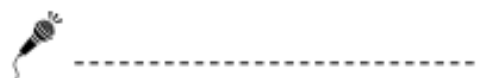
Appendix H

The Index of Item-Objective Congruence (IOC)

Description: The index of congruence is to validate the quality of this instrument (Comprehension Checking Task) Please indicate your agreement according to the following scale by placing +1, 0 and -1 in the box.

Scoring + 1   =   Certain that the test item is congruent with the objectives.

Scoring   0   =   Uncertain whether the test item is congruent with the objectives

Scoring - 1   =   Certain that the test item is NOT congruent with the objectives

Directions: There are twenty items, each of which has four choices: A, B, C, and D. For each item, circle the best answer. You have 30 minutes to complete this task.
Objectives   1. To ensure the test items are grammatical and sound natural to the native speakers.   2. To ensure the test items can be used to measure knowledge of English dative constructions among L1 Thai learners.

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
1.	The government of Thailand gave some money to many jobless people last year. ***What can be inferred from the statement above?*** a. The government of Thailand was given some money by many	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
	jobless people last year. b. Many jobless people gave the government of Thailand some money last year. c. The government of Thailand gave many jobless people some money last year. d. Some money was not given to jobless people by the government of Thailand last year.					
2.	Somsri's mother never sent a message to her on Facebook Messenger. *What can be inferred from the statement above?* a. Somsri's mother sometimes sent her a message on Facebook Messenger. b. Somsri never sent her mother a message on Facebook Messenger. c. Somsri's mother never sent her a message on Facebook Messenger. d. A message was sent by Somsri to her mother on Facebook Messenger.	+1	+1	+1	1	
3.	The teacher always read	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
	students a short story about science. *What can be inferred from the statement above?* a. The teacher never read students a short story about science. b. The teacher always read a short story about science to students. c. A short story about science was read by students to the teacher. d. Students read the teacher a short story about science.					
4.	Somsak threw the shirt to his friend in the crowd. *What can be inferred from the statement above?* a. The shirt was thrown by Somsak's friend in the crowd. b. Somsak did not throw his friend in the crowd the shirt. c. Somsak threw his friend in the crowd the shirt. d. Somsak's friend threw the shirt in the crowd.	+1	+1	+1	1	
5.	Ms. Yi Feng had taught	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
	Chinese to many business people for many years. *What can be inferred from the statement above?* a. Ms. Yi Feng had taught many business people Chinese for many years. b. Chinese had been taught by many business people for many years. c. Many business people had taught Chinese to Ms. Yi Feng for many years. d. Ms. Yi Fang had not taught Chinese to many business people for many years.					

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
6.	Mr. Thomson showed the pictures of Mount Fuji to his mother. *What can be inferred from the statement above?* a. The pictures of Mount Fuji were shown by Mr. Thomson's mother. b. Mr. Thomson showed his mother the pictures of Mount Fuji. c. His mother showed the pictures of Mount Fuji to Mr. Thomson. d. Mr. Thomson did not show the pictures of Mount Fuji to his mother.	+1	0	+1	0.67	Put an article 'the' before 'pictures'.
Average Result					0.945	

Description: The index of congruence is to validate the quality of this instrument (Preference Assessment Task) Please indicate your agreement according to the following scale by placing +1, 0 and -1 in the box.

Scoring + 1   =   Certain that the test item is congruent with the objectives.

Scoring   0   =   Uncertain whether the test item is congruent with the objectives

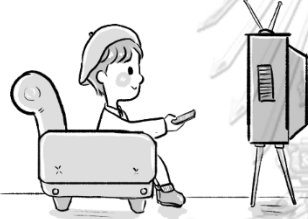Scoring - 1   =   Certain that the test item is NOT congruent with the objectives

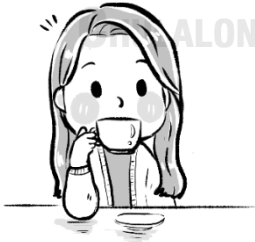| **Directions:** There are twenty items, each of which has two choices: A and B. For each item, circle the choice that your prefer. Please note that both choices are correct. You have 30 minutes to complete this task. |
|---|
| **Objectives**
 1. To ensure the test items are grammatical and sound natural to native speakers.
 2. To ensure the test items can be used to measure preferred structures of English dative constructions among L1 Thai learners. |

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
1.	My sister had sent_____ last month because there were a few job positions available. a. many international companies her resume b. her resume to many international companies	+1	+1	+1	1	
2.	Mr. Somchai gave _____ this morning. The watch he gave was absolutely beautiful. a. his son a watch for his birthday b. a watch to his son for his birthday	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
3.	Ms. Sumalee has been teaching_____ at an international school in Bangkok for three years. a. foreign students the Thai language b. the Thai language to foreign students	+1	+1	+1	1	
4.	Most parents read_____every night at bedtime. a. their children a funny story b. a funny story to their children	+1	+1	+1	1	
5.	In Thai culture, children should show _____. a. their parents respect b. respect to their parents	+1	+1	+1	1	
6.	The boy threw_____ . a. his girlfriend the snowballs b. the snowballs to his girlfriend	+1	+1	+1	1	
Average Result					1	

จุฬาลงกรณ์มหาวิทยาลัย

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Description: The index of congruence is to validate the quality of this instrument (Priming Task) Please indicate your agreement according to the following scale by placing +1, 0 and -1 in the box.

Scoring + 1   =   Certain that the test item is congruent with the objectives.

Scoring   0   =   Uncertain whether the test item is congruent with the objectives

Scoring - 1   =   Certain that the test item is NOT congruent with the objectives

Objectives
1. To ensure the test items are grammatical and sound natural to native speakers.   2. To ensure the sentences perfectly correspond to the pictures.

No	Questions	Expert 1	Expert 2	Expert 3	IOC Results	Suggestions
		Expert's Opinions				
1.	*The boy is feeding his cat a piece of cake.*	+1	+1	+1	1	
2.	*The girl is feeding the bird a piece of cookie.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
3.	*The house is being decorated by the boy.*	+1	+1	+1	1	
4.	*The girl is eating noodles.*	+1	+1	+1	1	
5.	*The man is going to hit the snake.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
6.	*The boy cannot climb the tree.*	+1	+1	+1	1	
7.	*The girl is giving the man a book.*	+1	+1	+1	1	
8.	*Somchai is selling the man his house.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
9.	The man is selling the girl an ice-cream cone.	+1	+1	+1	1	
10.	The boy is watching television.	+1	+1	+1	1	
11.	The girl is drinking some coffee.	+1	+1	+1	1	
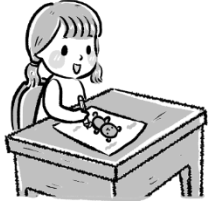
No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
12.	*The table is being cleaned by the man.*	+1	+1	+1	1	
13.	*The girl dances beautifully.*	+1	+1	+1	1	
14.	*The man is sending the girl a postcard.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
15.	*The girl is bringing the boy a letter.*	+1	+1	+1	1	
16.	*The man is bringing the customer the bed.*	+1	+1	+1	1	
17.	*The girl is studying Chinese.*	+1	+1	+1	1	
18.	*The man is walking his dog.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
19.	 *The car is being washed by the man.*	+1	+1	+1	1	
20.	 *The man is painting the wall.*	+1	+1	+1	1	
21.	 *The man is showing the teacher his homework.*	+1	+1	+1	1	
22.	 *The man is writing a letter to his mother.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
23.	 **The man is writing a note to the cashier.**	+1	+1	+1	1	
24.	 **The girl is playing the piano.**	+1	+1	+1	1	
25.	 **The man is moving the chair.**	+1	+1	+1	1	
26.	 **The deer is being chased by the tiger.**	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
27.	 *The girl is sweeping the room.*	+1	+1	+1	1	
28.	 *The man is teaching Chinese to the girl.*	+1	+1	+1	1	
29.	 *The man is taking a book to the teacher.*	+1	+1	+1	1	
30.	 *The boy is taking a dress to the girl.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
31.	 *The girl is drawing a picture.*	+1	+1	+1	1	
32.	 *The boy is getting angry.*	+1	+1	+1	1	
33.	 *The girl is drinking some milk.*	+1	+1	+1	1	
34.	 *The cake is made by the girl.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
35.	*The man is throwing a ball to the girl.*	+1	+1	+1	1	
36.	*The man is telling his experience to the girl.*	+1	+1	+1	1	
37.	*The girl is telling something to her mother.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
38.	*The boy is riding a bicycle.*	+1	+1	+1	1	
39.	*The man cannot fix his car.*	+1	+1	+1	1	
40.	*The girl is withdrawing some money.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
41.	*The man is planting a tree.*	+1	+1	+1	1	
42.	*The girl is reading a story to her son.*	+1	+1	+1	1	
	Average Result				1	
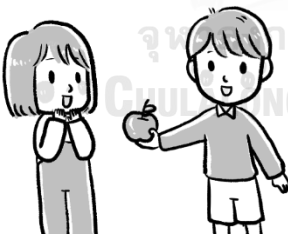
Description: The index of congruence is to validate the quality of this instrument

(Post-Priming Picture Description Task) Please indicate your agreement according to

the following scale by placing +1, 0 and -1 in the box.

Scoring + 1   =   Certain that the test item is congruent with the objectives.

Scoring   0   =   Uncertain whether the test item is congruent with the objectives

Scoring - 1   =   Certain that the test item is NOT congruent with the objectives

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Objectives

1. To ensure the test items are grammatical and sound natural to native speakers.
2. To ensure the sentences perfectly correspond to the pictures.

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
1.	*The boy is giving an apple to the girl.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
2.	*The girl is throwing a book to the boy.*	+1	+1	+1	1	
3.	*The teacher is teaching Japanese to the girl.*	+1	+1	+1	1	
4.	*Mother is reading a story to her son.*	+1	+1	+1	1	

No	Questions	Expert's Opinions			IOC Results	Suggestions
		Expert 1	Expert 2	Expert 3		
5.	*The boy is showing the picture of Wat Arun to the girl.*	+1	+1	+1	1	
6.	*The girl is sending a birthday gift to her mother.*	+1	+1	+1	1	
	Average Result				1	

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