การรับคุณานุประโยคแบบเจาะจงและแบบไม่เจาะจงในภาษาอังกฤษของผู้เรียนชาวไทย

นายอธิพงษ์ อมรวงศ์ปีติ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาอักษรศาสตรมหาบัณฑิต
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THE ACQUISITION OF ENGLISH RESTRICTIVE AND NON-RESTRICTIVE RELATIVE CLAUSES BY L1 THAI LEARNERS

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts Program in English
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อธิพงษ์ อมรวงศ์ปีติ : การรับคุณานุประโยคแบบเจาะจงและแบบไม่เจาะจงในภาษาอังกฤษของผู้เรียนชาวไทย. (THE ACQUISITION OF ENGLISH RESTRICTIVE AND NON-RESTRICTIVE RELATIVE CLAUSES BY L1 THAI LEARNERS) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. ดร.ณัฐมา พงศ์ไพโรจน์, 292 หน้า.

งานวิจัยนี้ศึกษาการรับคุณานุประโยคแบบเจาะจงและไม่เจาะจงโดยผู้เรียนที่มีภาษาไทยเป็นภาษาแม่เพื่อทดสอบว่าสมมติฐานที่เกี่ยวข้องกับคุณานุประโยคสามสมมติฐาน ได้แก่ ลำดับการเข้าถึงนามวลี (NPAH) สมมติฐานความยากต่อการรับรู้ (PDH) และ สมมติฐานลำดับประธาน-กรรม (SOHH) อันเป็นสมมติฐานใช้กับข้อมูลคุณานุประโยคแบบเจาะจงเท่านั้นมาโดยตลอด จะสามารถปรับใช้กับคุณานุประโยคแบบไม่เจาะจงได้เช่นเดียวกันหรือไม่ เนื่องจากการจำแนกคุณานุประโยคแบบเจาะจงและไม่เจาะจงในภาษาอังกฤษไม่ได้อาศัยการเรียงทางวากยสัมพันธ์เชิงเส้นที่แตกต่างกันและไม่ส่งผลต่อปัจจัยที่สมมติฐานเหล่านี้ใช้เป็นฐาน ผู้วิจัยจึงตั้งสมมติฐานว่าสมมติฐานทั้งสามนี้จะใช้ได้กับคุณานุประโยคทั้งสองแบบ อย่างไรก็ตาม เนื่องด้วยคุณานุประโยคแบบไม่เจาะจงพบได้น้อยกว่า ผู้วิจัยจึงตั้งสมมติฐานด้วยว่าการรับคุณานุประโยคแบบไม่เจาะจงจะแตกต่างจากการรับคุณานุประโยคแบบเจาะจง ผู้วิจัยได้ขอให้ผู้เข้าร่วมวิจัยที่เป็นนิสิตปริญญาตรีจำนวน 40 คน (เป็นผู้เรียนระดับกลาง 20 คน และผู้เรียนระดับสูง 20 คน) และเจ้าของภาษา 5 คน ทำแบบทดสอบตีความประโยคและแบบทดสอบตัดสินความถูกต้องทางไวยากรณ์ ผลการวิจัยพบว่ามีเพียงลำดับการเข้าถึงนามวลีเท่านั้นที่สอดรับกับการรับคุณานุประโยคทั้งสองประเภท สอดคล้องกับงานวิจัยเกี่ยวกับผู้เรียนชาวไทยในอดีต และบ่งชี้ว่าลำดับการเข้าถึงนามวลีสามารถนำไปปรับใช้กับคุณานุประโยคแบบไม่เจาะจงได้ ส่วนสมมติฐานความยากต่อการรับรู้สอดรับกับการรับคุณานุประโยคแบบเจาะจงเท่านั้น แต่ขัดแย้งกับการรับคุณานุประโยคแบบไม่เจาะจง ทั้งนี้อาจเป็นเพราะคุณานุประโยคแบบไม่เจาะจงมีตัวต้นแบบ (prototype) ที่ต่างจากคุณานุประโยคแบบเจาะจง ผลการวิจัยยังพบด้วยว่าข้อมูลคุณานุประโยคทั้งสองประเภทไม่ตรงกับสมมติฐานลำดับประธาน-กรรมและบ่งชี้ว่าความไม่ต่อเนื่องที่สมมติฐานนี้เสนอไม่สามารถพยากรณ์ลำดับการรับคุณานุประโยคทั้งแบบเจาะจงและไม่เจาะจง อนึ่ง ผลการวิจัยพบว่าผู้เรียนประสบปัญหาในการรับคุณานุประโยคแบบไม่เจาะจงมากกว่าแบบเจาะจง ความไม่สมมาตรนี้มีสาเหตุหลักจากการที่คุณานุประโยคแบบไม่เจาะจงมีให้พบเห็นได้น้อยกว่าและมีความเป็นตัวต้นแบบของคุณานุประโยคน้อยกว่าคุณานุประโยคแบบเจาะจง อีกทั้งยังมีการถ่ายโอนการจากเรียนและการสรุปเกินเป็นสาเหตุร่วมด้วย

ภาควิชา ภาษาอังกฤษ ลายมือชื่อนิสิต .....

สาขาวิชา ภาษาอังกฤษ ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก .....

ปีการศึกษา 2556

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KEYWORDS: L2 ACQUISITION / L1 THAI LEARNERS / ENGLISH RESTRICTIVE RELATIVE CLAUSES / ENGLISH NON-RESTRICTIVE RELATIVE CLAUSE / NOUN PHRASE ACCESSIBILITY HIERARCHY / PERCEPTUAL DIFFICULTY HIERARCHY / SO HIERARCHY HYPOTHESIS

ATIPONG AMORNWONGPEETI: THE ACQUISITION OF ENGLISH RESTRICTIVE AND NON-RESTRICTIVE RELATIVE CLAUSES BY L1 THAI LEARNERS. ADVISOR: ASSOC. PROF. NATTAMA PONGPAIROJ, Ph.D., 292 pp.

This study examined the acquisition of English restrictive and non-restrictive relative clauses (RRCs and NRRCs) by L1 Thai learners in order to test whether three RC-related hypotheses, namely the Noun Phrase Accessibility Hierarchy (NPAH), the Perceptual Difficulty Hypothesis (PDH), and the SO Hierarchy Hypothesis (SOHH), all of which had previously been confined to RRC data, would be equally applicable to NRRCs. As the distinction between English RRCs and NRRCs does not rely on the differences in linear syntactic arrangements that affect the factors these hypotheses are hinged upon, it was hypothesized that these three RC-related hypotheses would be equally applicable to both types of RCs. However, because NRRCs are less common, it was also hypothesized that the acquisition of NRRCs would diverge from that of RRCs. A sentence interpretation task and a grammaticality judgment task were administered to 40 undergraduate students (20 intermediate learners and 20 advanced learners) and five native speakers. The results showed that out of the three RC-related hypotheses, only the NPAH was the hypothesis that both RRC and NRRC acquisition trajectories appeared to conform to, lending support to previous works on L1 Thai learners and suggesting that the NPAH could be extended to NRRCs as well. The PDH seemed to apply only to the acquisition of RRCs while the acquisition of NRRCs systematically challenged the hypothesis, a phenomenon which was ascribed mainly to the possibility that NNRCs have a prototype different from that of RRCs. Interestingly, both RRC and NRRC data did not conform to the prediction made by the SOHH and suggested that discontinuities alone, as proposed by the hypothesis, could not adequately predict the acquisition orders for both RRCs and NRRCs. In addition, the results also demonstrated that learners experienced more difficulty in acquiring NRRCs than RRCs. This asymmetry in acquisition was attributed mainly to NRRCs' rarity and lesser degree of prototypicality in comparison to RRCs, as well as transfer of instruction and overgeneralization.

Department: English Student's Signature .....

Field of Study: English Advisor's Signature .....

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Chapter 1

Introduction

To set the context in the research arena for the study, this chapter presents the background of the study and states the objectives as well as the hypotheses of the study. Then, the significance and the scope of the study are discussed toward the end of the chapter.

1.1 Background of the study

Relative clauses (RCs) is one of the most vibrantly investigated structures in the English language, not only by syntacticians (e.g. Borsley, 1997; Fabb, 1990; McCawley, 1981; Safir, 1986, among others) but also by researchers who work on second language acquisition (SLA) (e.g. Bardovi-Harlig, 1987; Gass, 1979; J. A. Hawkins, 1999; Izumi, 2003, among others). Such interest can be attributed in part to their frequency and usefulness in everyday life (Izumi, 2003, p. 286). A corpus-based study by Biber et al. (1999, p. 606) has indicated that among non-prepositional postmodifiers, English relative clauses (ERCs) rank first in terms of frequency in every register, namely conversation, fiction, news, and academic texts. Given their

prevalence, RCs are one of the structures that learners who wish to master English have to be able to process and produce. In addition, RCs are easier to process than complex attributive structures (i.e. in English, stacking multiple prenominal modifiers) and make use of fewer words than independent clauses, allowing for an efficient complex adjectival modification (Celce-Murcia & Larsen-Freeman, 1999, p. 571).

Another aspect of RCs that draws many researchers' attention to the structure is their variety across languages as well as their implications for SLA (Izumi, 2003, p. 286). Schachter (1974, pp. 207-209) has identified three main dimensions of RCs that contribute to their variety and, thus, complexity. The first dimension is the position of the RC in relation to the head noun or the noun that is being modified. While RCs in many languages, including English, appear postnominally, resulting in right-branching RCs, several languages, such as Japanese, feature prenominal RCs, which result in left-branching RCs. Problems in acquiring ERCs, which are, postnominal, may arise if the position of RCs in learners' first language (L1) precedes rather than follow the head noun. The second dimension is related to RC marking. Different languages may make use of different linguistic features to mark RCs. For example, while English marks RCs with a relative pronoun, some other languages make use of other types of markers or none, such as Japanese. The differences in

the marking systems between L1 and L2 can also give rise to difficulties for acquisition. The last dimension concerns resumptive pronouns, or pronouns that are coreferential with the noun phrase the RC modifies. While standard English does not allow resumptive pronouns, some languages, such as Arabic, require pronoun retention in forming RCs (Celce-Murcia & Larsen-Freeman, 1999, p. 573). Learners whose L1 employs resumptive pronouns might have more problems acquiring ERCs. Because of these dimensions and their potential influence on L2 learners, RCs have been the subject of considerable amount of research in the realm of SLA.

Related to RCs and SLA are a number of language universals that have been proposed on the acquirability of this structure both for L1 and L2 speakers. The pioneering work that blazed the trail for other works to come belongs to Keenan and Comrie (1977), who proposed a universal called the Noun Phrase Accessibility Hierarchy (NPAH). The hypothesis, formulated from data from about 50 languages and typological markedness, or how common or uncommon a certain feature is across different typological patterns, posits a universal hierarchy that predicts the order of allowed relativization based on the syntactic role of the gap (or the missing element) of an RC. The symbols used are shown in Table 1.

Symbols	Meanings	Examples
SU	Subject	The cake that was on the table…
DO	Direct object	The cake that I ate…
IO	Indirect object	The cake that I baked you…
OPREP	Object of preposition	The cake that I put your name on…
GEN	Genitive	The cake whose lowest layer was chocolate…
OCOMP	Object of comparison	The cake that the pie was cheaper than…

Table 1: Explanations and examples for each symbol

The NPAH posits the order of relativization as shown in (1), with the symbol > signifying that the element on the left is more accessible to relativization than the element on the right.

(1) SU > DO > IO > OPREP > GEN > OCOMP

That is, subject relative clauses are more accessible to relativization than relative clauses with a direct object as a gap and so on.

Keenan and Comrie (1977, pp. 88-95) claimed that the hierarchy "reflects the psychological ease of comprehension," as supported by evidence in child L1

acquisition. Therefore, the hierarchy has been extended to SLA and extensively studied. Many studies conducted in the wake of the formulation of this hypothesis (Doughty, 1991; Eckman et al., 1988; Gass, 1979; Hyltenstam, 1984, among others) have also found that the higher the position of the RC in the hierarchy is, the easier it is to acquire that RC, effectively lending support to this claim.

Another language universal that has become the foundation of many research works on RCs and SLA is the Perceptual Difficulty Hypothesis (PDH) by Kuno (1974). In an attempt to explain why RCs in languages with a similar syntactic arrangement are positioned in relation to their head nouns in the same way, Kuno (1974) proposed that the phenomenon has to do with the capacity of the human memory system to retain temporary information; some syntactic arrangements are more perceptually difficult to process than others. To be more specific, center-embedded relative clauses (e.g. The person [who is speaking] is my friend.) create more perceptual difficulties than do left- or right-embedded relative clauses (e.g. My friend is eating the cake [that I baked]. (right-embedded)). Therefore, regardless of the grammatical function of the relativized material, the difficulty can be predicted from the position of the head of the relative clause in the matrix clause. In other words, the difficulty can be predicted not from the grammatical function of the relativized

material, but from the grammatical function of the head of the relative clause in the matrix clause. Therefore, it is postulated that RCs whose heads function as subject will normally appear center-embedded, and thus be more difficult to process than RCs whose heads function as object, as they will usually appear right-embedded as shown below.

(2) OS, OO, OIO, OOPREP, OGEN, OCOMP > SS, SO, SIO, SOPREP, SGEN, SOCOMP

For each pairing label, the first letter refers to the function or the syntactic role of the antecedent in the matrix clause, and the second letter refers to the syntactic role of the relative pronoun within the RC. Therefore, an example of OS is "He drank the milk [that ___ was already sour." That is, the head of the RC *the milk* functions as an object in the matrix clause, hence the first letter *O*, and the relativized material functions as a subject in the RC, hence the second letter *S*.

The hypothesis has also been extended to SLA and found support in a number of works (Cook, 1973; Ioup & Kruse, 1977; Iwami, 1991; Schumann, 1980, among others).

Last but not least, another universal that has lately garnered attention from researchers is the SO Hierarchy Hypothesis (SOHH) by Hamilton (1994). This hypothesis is based on processing discontinuities, or pauses in parsing while intervening elements are being interpreted or constructed.

(3)

a. Center-embedded The cake [that I ate] was on the table.

(1 discontinuity)

b. Right-embedded I ate the cake [that was on the table].

(no discontinuity)

(4)

a. Relativized subject (XS): The cake $_{CP}$ that$_i$ [$_S$ t_i was on the table].

(1 discontinuity)

b. Relativized object (XO): The cake $_{CP}$ that$_i$ [$_S$ I [$_{VP}$ ate t_i]]

(2 discontinuities)

These discontinuities can be created by either center-embedded RCs (as in 3a, compared to 3b) or by phrasal boundaries between relative pronouns and *wh*-trace created by relativation (as in 4a and 4b). The SOHH essentially combines the NPAH and the PDH. That is, the SOHH considers both the grammatical function of the head of the relative clause, whose discontinuity is produced when the relative clause is center-embedded as in the PDH, and the grammatical function of the gap, whose processing discontinuity is produced by phrasal boundaries within the relative clause that separate the relative pronoun and the wh-trace created by relativization as in the NPAH. This hypothesis postulates that the number of discontinuities present in an RC is proportional to the level of difficulty in processing and acquiring the RC. This means that in ERCs, it posits that OS (relativized subject RCs in object position) is the easiest to process and acquire because, according to the NPAH, relativized subjects are the easiest to acquire, and according to the PDH, RCs in object position causes less disruption in processing.

However, so far, either explicitly or tacitly, most research on acquisition of English relative clauses has been confined exclusively to restrictive relative clauses (RRCs). Although a few works has also taken into account data on non-restrictive relative clauses (NRRCs) (e.g. Phoocharoensil (2009)), they are rarely given the same

status or studied as comprehensively as RRCs. This may be ascribed partly to the fact this clause type is often dismissed as more uncommon than its counterpart. This perspective is endorsed by corpus findings in Biber et al (1999), which suggested that NRRCs make up only 15% of all RCs in fiction and academic prose. Also, to the best of my knowledge, the acquisition of the distinction between English RRCs and NRRCs, necessary for any further research on NRRCs, has never been investigated in the literature, and NRRCs have never been tested against all the aforementioned hypotheses, against which English RRCs have been tested in numerous works.

As a researcher and a learner of English myself, I do not believe that the rarity or uncommonness of English NRRCs should form grounds on which one can reject the importance of NRRCs as they have to be acquired by learners as well, and the failure to produce or recognize the distinction between RRCs and NRRCs can cause misunderstandings in communication.

(5)

a. The climbers who reached the summit were exhausted.

b. The climbers, who reached the summit, were exhausted.

(Celce-Murcia & Larsen-Freeman, 1999, p. 591)

For example, the head noun *the climbers* in (5a) and (5b) are interpreted differently. While the climbers in (5a) are construed as only a portion of the group of climbers who started climbing, the same head noun is interpreted as the entire group of climbers; that is everyone succeeded in reaching the summit and was all exhausted. Learners might not be able to understand or express the distinction, especially in such a succinct and effective manner, if they have not acquired NRRCs.

In addition, the extent to which the language universals mentioned above are applicable to the acquisition of NRRCs by L2 learners might yield not only theoretical implications for SLA, but also pedagogical implications as well.

Therefore, because of such gaps in the body of research, this study aims to investigate NRRCs as an equal to RRCs and look into how the distinction between the

two can be acquired and how NRRCs interact with the hypotheses on RCs in comparison to RRCs.

1.2 Objectives of the study

The objectives of this study were:

1) To test the applicability of the NPAH, PDH, and SOHH to English NRRCs in comparison to English RRCs by L1 Thai learners.

2) To compare the extent to which the acquisition order of English RRCs and NRRCs conforms to the NPAH, PDH and SOHH.

1.3 Hypotheses

The hypotheses of the current study were as follows:

1) The NPAH, PDH, and SOHH will be applicable to the acquisition of English NRRCs as the distinction between English RRCs and NRRCs does not rely on the differences in linear syntactic arrangements that affect the factors these hypotheses are hinged upon, namely the position of the grammatical role of the relativized material and the position of the RC in relation to its head.

2) Although the three hypotheses will be applicable to the acquisition of both RRCs and NRRCs, the extent to which they are applicable to RRCs and NRRCs will differ. That is, while the acquisition order might be the same for RRCs and NRRCs, the rate at which the same type of RC is acquired might diverge for RRCs and NRRCs.

1.4 Significance of the study

The present study is significant for the following reasons.

First of all, NRRCs have never been systematically studied in relation to language universal. More precisely, even the studies in which the NPAH (Keenan & Comrie, 1977), the PDH (Kuno, 1974), and the SOHH (Hamilton, 1994) were first proposed, and in effect subsequent research that tried to prove or disprove these hypotheses, have consistently excluded NRRCs from their consideration. The scenario results in a blind spot in the research body related to RC universals. Although this study does not attempt to come up with a language universal on its own or claim that these hypotheses also apply to NRRCs in any language, because of an apparent lack of data from other languages, it will help elucidate if these hypotheses can be extended to NRRCs in the context of L1 Thai and L2 English and if this area is worth exploring further.

Second, there has been a serious lack of research on the acquisition of NRRCs, especially in the context of L2 and the aforementioned language universals. Also, the studies that do take NRRCs into account do not seem to hold them up to the same scrutiny as RRCs. Although Phoocharoensil (2009), one of the most comprehensive studies on the acquisition of ERCs by L1 Thai learners to date, included NRRCs in his analysis, the focus of the study appeared to be mainly on RRCs since the data were mostly RRCs. Since this study aims to tip the balance and give an equal importance, if not more, to NRRCs, it can help shed some light on the link, or possibly a lack thereof, between the acquisition of NRRCs and the three language universals.

Third, studies on the acquisition of ERCs of L1 Thai learners are relatively rare. Some among this handful are Gass (1979), Kanno (2007), Phoocharoensil (2009), Phoocharoensil and Simargool (2009), Amornwongpeeti and Pongpairoj (2013). This study will contribute to the pool of research in order to create a more complete account of ERC acquisition by L1 Thai learners as well as the link between ERC acquisition by L1 Thai learners and the three language universals established by the previous studies.

1.5 Scope of the study

To keep the study manageable and reasonable, the scope of the study was demarcated and outlined in this section, along with the motivations behind such decisions.

1.5.1 Types of RCs in this study

While there are six types of RCs classified by the function of the gap in the RCs (subject, direct object, indirect object, genitive, object of preposition, and object of comparison), some types were excluded from the study to minimize potential problems.

First of all, indirect objects were eschewed because they can most of the time be expressed as objects of preposition as well.

(6)

a. Dative movement pattern: I gave [you] a book.

b. Prepositional pattern: I gave the book *to* [you].

For instance, while *you* in (6a) functions as an indirect object in the dative movement pattern[1], it can be expressed as an object of the preposition *to* in the prepositional pattern in (6b). Keenan (1975, cited in R. Ellis (1994, p. 419)) acknowledged this fact and stated that IO and OPREP are indistinguishable in most languages including English.

(7)

a. The official [to whom Mary gave the present] is sick.

b. The official [to whom Mary spoke] is sick.

(Ellis, 1994, p.419)

In (7a), the indirect object *whom* is expressed as the prepositional phrase *to whom* in a fashion similar to the relativized object of preposition *to whom* in (7b). Similarly, Gass (1979, cited in Gass and Selinker (2008, p. 198)) conflated the indirect object and the object of preposition into one position, citing their "analogous behavior" as

[1] Dative refers to a case form of a noun that functions as an indirect object (Radford et al., 2009, p. 158). Dative movement is a rule in English that moves the indirect object to the position between the verb and the direct object as well as deletes any preposition that precedes the indirect object in the preposition pattern (Cowan, 2010, p. 4).

motivation. This view is further buttressed in Keenan and Comrie (1977, p. 72), who asserted that many languages assimilate indirect objects to objects of preposition in the formation of RCs, and in Comrie (1989, p. 155), which merged indirect objects and objects of preposition into a single category of non-direct objects but gave a prepositional object RC in English as an example of this new category (i.e. the girl for whom the man bought the book). In light of this preference for an object of preposition as a more suitable position in the hierarchy, indirect object RCs were not included in this study.

Second, objects of comparison also pose a number of controversies too delicate to be sufficiently investigated within the scope of this study. Firstly, Keenan and Comrie (1977, p. 74) admitted that relativized objects of comparison are deemed to be only marginally acceptable by native speakers and stated that although a language allows this type of RC, most speakers will prefer other semantically equivalent alternatives in which the object of comparison is expressed as a subject instead.

(8)

a. the man who is shorter than Mary

b. the man who Mary is taller than

For example, (8a), in which the relativized material *who* functions as a subject rather than as an object of comparison as in (8b), is generally preferred. Secondly, Keenan and Comrie (1979b, p. 662) concurred with observations made by Maxwell (1979) that *than* can function as a preposition, the phenomenon which in effect forces objects of comparison to be subsumed under objects of preposition. Another problematic area lies within the conception of the category itself. J. A. Hawkins (1999) argued that the data from 50 languages Keenan and Comrie (1977) used to form the category were not systematic enough for the coding of the category, which is highly variable across languages, to be reliable. Even Comrie (1989, p. 156) omitted objects of comparison from the accessibility hierarchy. With all these reasons, this study did not collect data on this type of RC.

Last of all, genitive RCs are also besieged with contentious issues. First of all, even Keenan and Comrie (1977, pp. 90-91) themselves admitted that relativized genitives are often awkward and in many cases, an alternative that relativizes a

position higher on the hierarchy is preferred. Second, a few researchers have also argued against including genitive RCs in the NPAH because when genitives in English RCs are formed with the use of 'whose,' the element that 'whose' is attached to can take any of the five other syntactic roles on the NPAH. Jones (1991, cited in R. Ellis (1994, p. 419)) asserted that genitives form their own hierarchy, resulting in two hierarchies, one characterized as -Genitive and the other as +Genitive, as shown in Table 2.

Syntactic roles	-Genitive	+Genitive
SU	The man who came …	The man whose wife came …
DO	The man (whom) I saw …	The man whose wife I saw …
IO	The man (whom) I gave the book to …	The man whose wife I gave the book to …
OPREP	The man (whom) I looked at …	The man whose wife I looked at …
OC	The man (whom) I am bigger than …	The man whose wife I am bigger than …

Table 2: The Accessibility Hierarchies for –Genitive and +Genitive (Jones, 1991, cited in R. Ellis, 1994, p. 419)

This practice was mirrored in J. A. Hawkins (1999, p. 255), who employed GEN: SU, GEN: DO, GEN: IO, and GEN: OBL (OBL stands for oblique and is equivalent to

object of preposition in English RCs) to create another hierarchy within the NPAH. However, Li (2007, p. 42) proposed that genitives should be omitted from the NPAH altogether because the position of the relativized material in this RC type does not depend on its grammatical function in the RC. Therefore, genitive RCs were also excluded from the present study.

In conclusion, this study included only SU, DO, and OPREP, similar to Eckman et al. (1988) and Izumi (2003).

1.5.2 Pied-piping and stranded prepositions

When an object of a preposition is relativized, there are two possible positions where the preposition can appear.

(9)

a. The mattress [which/that he slept *on* _____] had several broken springs.

b. The mattress [*on* which he slept] had several broken springs.

(adapted from Cowan, 2010, p. 424)

The first position that the preposition can take is at the site of the gap. In this pattern, called preposition stranding, as in (9a), the preposition *on* is stranded at the gap left by the relativized material *which/that* that moves to the front of the RC. Alternatively, the preposition can appear in front of a *wh*-relative pronoun. This pattern is called pied-piping and is demonstrated in (9b), in which the preposition *on* precedes the relative pronoun *which* instead of remaining at the gap.

In terms of their frequency, corpus evidence has shown that preposition stranding in ERCs is quite common across genres except academic prose while pied-piping is common only in academic language (Biber et al., 1999, pp. 106, 625). This phenomenon might be motivated in part by the sense of pomposity that pied-piping creates (Quirk et al., 1985, p. 1263), which leads to its avoidance in an informal context.

The present study limited itself to only preposition stranding so as to stay in line with other previous research works (Gass, 1979; R. Hawkins & Chan, 1997; Izumi, 2003, among others) and facilitate comparisons of findings.

1.6 Outline

The thesis is organized as follows:

Chapter 2 covers the definitions of language universals, the link between language universals and SLA, as well as discusses in detail the backgrounds and the hypotheses of the three language universals related to RCs, namely the NPAH, the PDH, and the SOHH. It also reviews some of the empirical studies on these universals in SLA context, with an emphasis on those with L1 Thai subjects.

Chapter 3 addresses the distinctions between RRCs and NRRCs in the first section. Then, the characteristics of RRCs and NRRCs in English and Thai drawn from previous literature are delineated and compared.

Chapter 4 details the methodology of the study, including the subjects, the research instruments, data collection, and data analysis.

Chapter 5 analyzes the data collected and presents the results of the experiment in detail.

Chapter 6 discusses the extent to which the acquisition of ERCs conforms to the language universals and the extent to which the acquisition of English NRRCs differs from that of English RRCs. Some of the possible explanations for the findings are also provided.

Chapter 7 concludes the thesis with the summary of the findings, the implications, the limitations, and recommendations for future research on language universals, RCs, and SLA.

Chapter 2

Relative clauses in English and Thai

In order to better understand the acquisition of English RCs, it is necessary to first review what RCs are and how different they are from Thai RCs. Therefore, this chapter sets out to discuss some of the aspects of RCs relevant to the current study. These aspects, including definitions, parameters in RC typology, and the distinction between RRCs and NRRCs, are outlined in 2.1. Then, a description of these aspects in English and Thai RCs is provided in 2.2 and 2.3 respectively. Similarities and differences between English and Thai RCs are then summarized in 2.4.

2.1 Relative clauses

To put the characteristics of English and Thai RCs in context of typology and language universals, it is necessary to discuss some basic definitions, related RC typology, and different types of RCs.

2.1.1 Definition

While there are various ways in which RCs can be defined, most attempts revolve around syntactic and semantic definitions. In syntactic terms, RCs seem to resist a single unified universal definition. This is because the surface structures of RCs vary so greatly across languages that it has been claimed that there is no such thing as a syntactic universal of RCs (Downing, 1978, pp. 377-378). Any definition that presents a checklist of necessary and sufficient conditions that need to be fulfilled will face the challenge of having to come up with an elegant set of conditions that will not exclude any structure that should qualify. As a consequence, most syntactic definitions of RCs usually center on characteristics of the prototypical RC in order to acknowledge the existence of the less prototypical RCs in some languages and allow them to be included in studies. Therefore, RCs are generally loosely defined as a subordinate that contains an argument that shares a referent with an element in the matrix clause (C. Lehmann, 1986, p. 634; Suktrakul, 1975, p. 38) An example in English is shown in (10).

(10) I ate the cake [which was in the fridge].

In (10), the RC ‘which was in the fridge’ is a subordinate clause that modifies the NP ‘the cake.’ In addition, the relativizer ‘which,’ which functions as an argument of the verb ‘was,’ refers to ‘the cake’ in the matrix clause ‘I ate the cake,’ resulting in ‘which’ and ‘the cake’ sharing the same referent.

In the face of the difficulty of devising a universal syntactic definition of RCs, many researchers, especially those in the field of typology whose work requires them to study RCs with various surface structures, including Keenan and Comrie (1977), opt for semantic definitions. Generally, RCs are semantically defined as subordinate clauses which modify or express a proposition about a NP in the matrix clause (Downing, 1978, pp. 378-380; C. Lehmann, 1986, p. 664). For example, in (10), the RC ‘which was in the fridge’ modifies by way of restriction the NP ‘the cake’ in the matrix clause, delimiting the possible referents of ‘the cake.’

In sum, a definition of the prototypical RC generally accepted and commonly employed combines both syntactic and semantic descriptions. That is, a RC is a subordinate clause which contains an argument that is coreferential with a NP in the matrix clause and which modifies or expresses propositions relevant to the NP.

2.1.2 RC typology

The cross-linguistic variation of RCs has inspired many researchers to focus on RC typology. A number of parameters that give rise to the diversity of RCs across languages have been identified across various works (Andrews, 2007; Comrie, 1989; C. Lehmann, 1986, among others) and are discussed below. It should be noted that English examples will be given first and foremost where possible. In addition, a more thorough description of these aspects in English and Thai RCs will be reserved for 2.2. and 2.3 respectively.

The first parameter concerns the position of the head noun, which can be classified into two types: external and internal. An external RC features a head noun that appears outside the RC, as shown in (11), while an internal RC has a head noun that occurs inside the RC, as shown in (12).

(11) External

He released the frog [that he found]. (English)

(12) Internal

[tənay ʔəwa: ʔəwu:w] –pu I^{Y} ʔciyawx (Diegueño)

yesterday house I-saw DEF LOC I-will-sing

'I will sing in the house that I saw yesterday.'

(Comrie, 1989, p. 138)

In (11), because the head noun 'the frog' lies outside the RC 'that he found,' the RC is external. On the other hand, in (12), the head noun 'house' occurs inside the RC, and therefore the RC is internal. External RCs are found in English, Turkey, and Persian, among many others, while internal RCs often appear in minority languages such as Diegueño, Mohave, and Bambara (C. Lehmann, 1986, pp. 664-665).

The second parameter is related to the relationship between RCs and the matrix clause. To be more specific, RCs in a given language can be either embedded in a matrix clause or adjoined to a matrix clause. RCs are classified as embedded if RCs together with their head nouns form NPs (C. Lehmann, 1986, p. 665) On the other hand, adjoined RCs are not constituents of their matrix clauses. Their head nouns appear as full NPs in these RCs and are repeated as full NPs again in the

matrix clauses. The examples of these two types are shown below in (13) and (14) respectively.

(13) Embedded

I drank the coffee [that you bought]. (English)

(14) Adjoined

[ādmī ne jis cākū se murgī ko māra thā], (Hindi)

man ERG which knife with chicken ACC killed

us cākū ko Rām ne dekhā

that knife ACC Ram ERG saw

'Ram saw the knife with which the man killed the chicken.'

(Comrie, 1989, p. 139)

In (13), the RC 'that you bought' can be described as embedded in the matrix clause 'I drank the coffee' because the RC and its head noun 'the coffee' together form a

single noun phrase ‘the coffee that you bought,’ which in turn serves as a constituent in the matrix clause. On the other hand, the RC shown in brackets in (14) is only loosely adjoined to the matrix clause because the head NP ‘**cākū**’ appears in full NP form in both the RC and the matrix clause. Languages that make use of embedded RCs include Japanese, Persian, and Turkish (Andrews, 2007, p. 208), while adjoined RCs can be found in languages such as Bambara, Hittite, and Walbiri (C. Lehmann, 1986, p. 665).

The next parameter deals with the position of the RC in relation to the head noun. There are altogether five possible positions for an RC to appear: preposed, postposed, circumnominal, prenominal, and postnominal (the last two together are sometimes subsumed under the term adnominal). Before a description of each type, it should be mentioned first that the first two appear only in adjoined RCs while the rest appear in embedded RCs. Also, preposed and circumnominal appear only in internal RCs while the rest can be found in RCs with external heads. These parametric relationships are shown in Table 3.

Head position/Subordination	Adjoined	Embedded
Internal	Preposed	Circumnominal
External	Postposed	Adnominal (postnominal and prenominal)

Table 3: Parametric relationships between head positions, types of subordination, and RC positions in relation to head noun (C. Lehmann, 1986, p. 665)

(15) Preposed

[n ye tyè mìn ye], ò be finì fère (Bambara)

[I COMPL man REL saw] D3 IMPF cloth:DEF sell

'The man I saw, (he) sells the cloth."

(Bird, 1968, p. 43, cited in C. Lehmann, 1986, p. 664)

The first type is preposed or left-extraposed RCs. These RCs precede the main clause and usually appear to exhibit the syntax of independent clauses, as shown in (15). That is, the RC '**n ye tyè mìn ye**' precedes the main clause and appears to be very similar to an independent clause.

(16) Postposed

autíka d’ égnō oulēn (Ancient Greek)

at once however recognized:3.SG scar: ACC.SG.F

[tēn poté min sûs ēlase]

DEM:ACC:SG:F once him boar:NOM.SG stroke:3.SG

‘At once she recognized the scar which once a boar had struck him.’

(C. Lehmann, 1986, p. 669)

The second type is postposed or right-extraposed RCs or RCs that follow their matrix clauses. This type of RCs is illustrated in (16), in which the RC shown in brackets appears to be an independent clause that is tagged to the end of the matrix clause.

(17) Circumnominal

[(shí) lééchąą'í b-á hashtaal-ígíí] nahal'in. (Navaho)

[I dog 3-for IMPF:1:sing:NR] IMPF:bark

'The dog I am singing for is barking.'

(Platero, 1974, p. 40, cited in C. Lehmann, 1986, p. 669)

The third type is circumnominal RCs, and because these RCs are strictly internal-headed, they are characterized by head nouns that are embedded or surrounded by the RCs they appear in. For example, in (17), the head noun '**lééchąą'í**' is surrounded by the RC shown in brackets.

(18) Prenominal

Kore-wa [ano hito-no kai-ta] hon desu. (Japanese)

D1-TOP [D3 person-GEN write-PAST] book COP

'This is the book that man wrote.'

(Kuno, 1973, cited in C. Lehmann, 1986, p. 669)

The fourth type is prenominal RCs or RCs that precede their head nouns, resulting in left-branching. In addition, unlike preposed RCs, prenominal RCs are tethered to their head nouns and not the matrix clause, which means that prenominal RCs do not always appear to precede the matrix clause. For instance, in (18), the RC shown in brackets appears to the left or precedes the head noun ‘hon’ or ‘book.’

(19) She broke the lamp [that her brother made].

The last type is postnominal RCs and is a mirror to prenominal RCs in that postnominal RCs follow their head nouns and produce right-branching. However, they are different from postposed RCs in that a postnominal position is dictated by the position of the head noun, and not the matrix clause. Also, although postnominal RCs can appear at the end of the sentence when their head nouns are the last element in the matrix clauses, they still differ from RCs that are postposed in that the former are embedded in the matrix clause while the latter are only loosely adjoined to the matrix clause. This type of RCs is illustrated in (19), in which the RC ‘that her brother made’ appears to the right or follows the head noun ‘the lamp.’

The fourth parameter involves the role of the head noun. The ways these different roles are encoded are called strategies, and at least four strategies have been identified: non-reduction, pronoun retention, relative pronoun, and gap (Comrie, 1989, pp. 147-153).

(20) Non-reduction

[tənay ʔəwaː ʔəwuːw] –pu lˀ ʔciyawx (Diegueño)

yesterday house I-saw DEF LOC I-will-sing

'I will sing in the house that I saw yesterday.'

(Comrie, 1989, p. 138)

The first strategy is the non-reduction strategy. It involves a head noun that appears as a full and unreduced NP either in the RC. An example from Diegueño is shown in (12), repeated here in (20), in which the head noun '**ʔəwa**ː' or 'house' appears in a full NP form in the RC. This type is considered the most explicit among all the strategies in that the head noun is not reduced, copied, or omitted in any

way. Some of the languages that make use of this strategy are Bambara, Hindi, and Diegueño.

(21) Pronoun retention

Man zan -i-rā [ke Hasan be u sibe zamini dād] (Persian)

I woman ACC that Hasan to her potato gave

mišenāsam.

I-know

'I know the woman to whom Hasan gave the potato.'

(Comrie, 1989, p. 148)

The second strategy makes use of pronoun retention. That is, a coreferential pronominal copy of the head noun, or a resumptive pronoun, remains in the RC. An example from Persian in (21) below illustrates this strategy. It can be seen that the resumptive pronoun 'u' or 'her' in the RC is a pronominal copy that is coreferential with 'zan' or 'woman' in the matrix clause.

(22) Relative pronoun

She looks like the woman whom I saw yesterday. (English)

The third strategy is characterized by the use of relative pronouns. Found most frequently in European languages, this strategy differs from pronoun retention in that a pronominal element that is coreferential with the relativized material in the RC must appear in the clause-initial position, only occasionally preceded by a preposition (Comrie, 1989, p. 149). However, because it is moved to the initial position of the RC and can no longer encode case through word order, this pronominal element must be case-marked to indicate the role of the relativized NP. This strategy can be found in a variety of English that distinguishes between 'who' and 'whom.' In (22), 'whom' is a relative pronoun because it is coreferential with its head 'the woman' in the matrix clause, moved to the clause-initial position, and is case-marked to show an accusative case.

(23) Gap

a. I ate the cake which/that ø was on the table. (English)

b. I ate the cake which/that you baked ø.

The last strategy is the gap strategy. Gaps refer to missing NPs within RCs that are coreferential with their head NPs. This strategy represents the least explicit strategy on the spectrum because it does not employ any overt indication of the role of the head within the RC. This is shown in an example from English in (23). While the RC in (23a) relativizes a subject and the RC in (23b) relativizes a direct object, the difference is not indicated through any element. To be more specific, the relativizers 'that' and 'which' give no clue as to what role the missing NP has.

It should be noted that a language can make use of more than one strategy in relativization. For example, Persian makes use of a relative pronoun to relativize subjects and direct objects but pronoun retention to relativize direct objects and indirect objects (Comrie, 1989, pp. 147-148).

Also related to RC typology are the grammatical functions of the NP in the RC that can be relativized. That is, languages can vary as to the same number of

grammatical functions they can relativize. There are six grammatical functions that have been identified as relativizable, namely subjects, direct objects, indirect objects, objects of preposition, genitive, and comparative. The accessibility to these different relatives is said to be hierarchical, as proposed by Keenan and Comrie (1977). This topic will be discussed in detail in 3.1.1.

2.1.3 Restrictive and non-restrictive RCs

RCs can also be classified on the basis of their semantic functions into restrictive RCs and non-restrictive RCs. RRCs are those that 'serve to limit the possible referents of the NPs in which they occur' (Wasow et al., 2011, p. 187). For example, in 'the books that he read,' the RRC restricts what the book can refer to to only those that this person read, not just any book; that is, the RRC restricts the referent of the head noun the books to only a subset. This type of RCs is also called integrated, identifying, and defining relative clauses (Arts & McMahon, 2006, p. 210; Swan, 2005, p. 479).

On the other hand, NRRCs are those that "convey an independent assertion about the referent of its associated head" (Stowell, 2005, p. 608). For example, in 'the books, which were given to him,' the NRRC does not limit the possible referent

of the books, but rather gives additional information about the book. NRRCs are often assumed to be less prototypical than RRCs, as reflected in Comrie (1989, p. 139), who stated that NRRCs are less central to the notion of relative clause than RRCs. This type of RCs is also called appositive, supplementary, non-identifying, and non-defining RCs. (Arts & McMahon, 2006, p. 210; Stowell, 2005, p. 608; Swan, 2005, p. 479).

The distinction between RRCs and NRRCs can be expressed differently across languages although it seems only a handful actually encode such a distinction formally. In some languages, RRCs and NRRCs are syntactically distinguishable. In other languages, however, the distinction is expressed only through intonation (Comrie, 1989, p. 139). One of the languages that possess a formal way of signaling such a difference is Persian. In Persian, the head of an RRC must be signaled with the suffix –i while the head of an NRRC is not subject to the same requirement, as shown in (24) below.

(24) a. RRC

Mardhā-i [ke ketābhārā be ānhā dāde budid] raftand. (Persian)

men that books to them you-had-given went

'The men that you had given the books to went.'

b. NRRC

Mo'allef [ke nevisandeye xubi –st] in sabkrā (Persian)

author that writer good is this style

exteyār karde ast

has-chosen

'The author, who is a good writer, has chosen this style.

(Comrie, 1989, p. 139)

In (24a), the head noun '**Mardhā-i**' is shown to be a head of an RRC by the suffix –i. However, because (24b) is an NRRC, the head noun '**Mo'allef**' is not suffixed with –i.

2.1.4 Other classifications of RCs

RCs have also been divided on the basis of other considerations into three major types: adnominal, nominal, and sentential (Crystal, 2008, p. 411).

(25) Adnominal

The soup [that I had] was delicious.

(26) Nominal

[What I had] was delicious.

(27) Sentential

The soup was actually delicious, [which was surprising].

The first type is adnominal RCs. These RCs are part of a constituent of the matrix clause, mainly as a modifier of a head noun in the matrix clause. Adnominal RCs are

the central type of RCs (Quirk et al., 1985, pp. 1244-1245) and the only type of RCs that is considered in the current study. An example of an adnominal RC is shown in (25), in which the RC 'that I had' appears to be part of the constituent 'The soup that I had' in the matrix clause. The second type is nominal RCs or free RCs[2]. They are different from the other types in that their antecedents are contained within the RCs. In addition, nominal RCs form a constituent in the matrix clause on their own (Quirk et al., 1985, p. 1244). For example, in (26), 'What I had' is a nominal RC because the antecedent 'what' is inside the RC and because the whole RC functions as a subject of the matrix clause. The last type is sentential RCs. The head of a sentential RC is a unit larger than a NP, usually a clause (Quirk et al., 1985, p. 1245). An example is given in (27), in which the sentential RC 'which was surprising' modifies the whole matrix clause rather than any NP in particular.

[2] Nominal RCs or free RCs are often confused with interrogative clauses because they can appear to be identical on the surface. However, a point of distinction lies in the fact that free RCs normally behave like noun phrases while interrogative clauses do not (B. Aarts, 2011, p. 202).
(a) I wondered [what he said].
(b) I rejected [what he said].
Because 'wonder' normally takes a clause as a complement, [what he said] in (a) is an interrogative clause. On the other hand, 'reject' cannot take a clause as a complement. Therefore, [what he said] in (b) is a free RC.

2.2 English RCs

In this section, a thorough description of English RCs is outlined in relation to the various parameters mentioned above, accessibility to relativization, and restrictiveness.

2.2.1 Typological description of English RCs

This section sets out to describe English RCs in terms of parametric variations discussed above.

2.2.1.1 RC position, relationship between RC and matrix clause, and head position

In terms of the position of RC in relation to the head noun, English RCs are postnominal or right-branching in nature. This entails that, in terms of the relationship between the RC and the matrix clause as well as the position of the head noun, they are also embedded within their matrix clauses and have external heads as shown in Table 3 (see 2.1.2). This is illustrated in (28) below.

(28) The books [that you bought] are outdated.

It can be seen that the RC ‘that you bought’ is postnominal in that it follows the head ‘The books’ that it modifies. In addition, the RC together with the head forms a NP, which is characteristic of an embedded RC. In addition, the head noun ‘The books’ also appears outside the RC, making this RC external-headed.

2.2.1.2 Relativization strategy and relative markers

As for relativization strategies, English is usually considered to use the gap strategy. That is, no overt indication of the role of the head within the RC is present. Although traditional English grammar mentions relative pronouns, English cannot be said to use the relative pronoun strategy because the term is used loosely and does not meet the case-marking requirement posited in typological studies, with the exception of the dichotomy between ‘who’ and ‘whom,’ which is also diminishing. In (28), for example, no element in the RC, even ‘that,’ which traditional grammar regards as a relative pronoun, is case-marked or able to indicate the role of the head in the RC. That is, there is no way to decode the role of the head in the RC from a specific pronominal element. One can only know that ‘that’ functions as a direct object through other syntactic properties (Comrie, 1989, p. 152). That is, because

'you' has already filled the subject slot while the verb 'bought' requires a direct object, 'that' can only be sensibly interpreted as the missing direct object.

Within this gap strategy, English makes use of five relative markers, namely 'that,' 'which,' 'who,' 'whom,' and 'whose,' as shown in (29).

(29) a. that The invention *that* Jobs created changed the world.

b. which This is the road *which* leads to the forest.

c. who He is the person *who* is behind the creation.

d. whom The person to *whom* you sent the letter did not exist.

d. whose The writers *whose* works do not sell are dropped from the publishing house.

The choice of relative markers is mostly dictated by semantic features (Celce-Murcia & Larsen-Freeman, 1999, p. 582). Generally, 'who' and 'whom' ([+human]) are restricted to human head nouns, while 'which' ([–human]) covers inanimate entities. 'That,' however, is [±human] and covers both, while 'whose' is used to signify possession.

In RRCs, ‘that,’ ‘which,’ ‘who,’ and ‘whom’ can be omitted if they function as an object in the RC, except in pied-piping structures (Stowell, 2005, p. 608). If these relative markers are omitted in other circumstances, ungrammaticality results. This is illustrated in (30).

(30) a. I like the cake [(that) you bought].

b. This is the park [(which) he came to every evening].

c. * This is the park [to (which) he came every evening].

d. *I like the cake [(that) was on the table].

e. *The cake[, (which) I baked for her,] was too sweet.

In (30a) and (30b), the relative markers ‘that’ and ‘which’ can be omitted because they function as a direct object and an object of preposition, respectively. However, in (30c), although ‘which’ functions as an object of preposition, as in (30b), the omission results in ungrammaticality because the pied-piping structure does not allow the omission. Similarly, if ‘that’ in (30d), which functions as a subject, is

omitted, the sentence will become ill-formed. In addition, any omission in NRRCs also results in ungrammaticality as shown in (30e).

Another point worth mentioning on the topic of relativization strategies is that English RCs usually do not allow pronoun retention. That is, resumptive pronouns result in ungrammaticality, as shown in (31) below.

(31) *The books [that you bought *them*] are outdated.

In (31), 'them' is a resumptive pronoun, coreferential with the head noun 'The books,' and is not allowed. However, when a RC is quite lengthy, sometimes resumptive pronouns are accepted such as this sentence, which is taken from the Nijmegen corpus, an English corpus containing approximately 130,000 words from both written texts and spoken recordings: "And what a performance by the man who some of us thought that may be the pressure of being the favourite of Wimbledon might not let *him* win" Native speakers seem to accept the use of the resumptive pronoun *him* and reject the "grammatical" version without (J. Aarts, 1991, p. 48).

2.2.2 Accessibility to relativization

English is among a few languages that allow all the six grammatical functions of the NP in the RC to be relativized, using the gap strategy (Keenan & Comrie, 1977, p. 74), as shown in (32)

(32) Subject

a. The cake [that ø was on the table] was delicious.

Direct object

b. The cake [that I ate ø] was delicious.

Indirect object

c. The person [that I gave ø the cake] was my friend

Object of preposition

d. The cake [that I put your name on ø] was delicious.

Genitive

e. The cake [whose lowest layer was chocolate] was delicious.

Object of comparison

f. The cake [that the pie was cheaper than ø] was delicious.

In (32a-32f), it can be seen that English can relativize subjects, direct objects, indirect objects, possessives, objects of preposition, and objects of comparison. Also, all the relativization makes use of the gap strategy, with ø representing a null pronoun coreferential with its head in each sentence.

2.2.3 English RRCs and NRRCs

English encodes the distinction between RRCs and NRRCs in a number of ways. First of all, prosody and intonation can be used to signal this distinction. More specifically, RRCs in English are not marked by any pause or intonation shift, while NRRCs are (Arts & McMahon, 2006, p. 211; Bache & Jakobsen, 1980, p. 244; Swan, 2005, pp. 495-496).

Second, commas are usually used to separate NRRCs from their heads while RRCs do not make use of any punctuation (Bache & Jakobsen, 1980, p. 244; Biber et al., 1999, p. 602; Swan, 2005, pp. 495-496).

(32) a. My brother who lives in Arizona is named Pat. (RRC)

b. My brother, who lives in Arizona, is named Pat. (NRRC)

It can be seen that although their meanings differ greatly, the former implying that the speaker has more than one brother while the latter not, the only surface difference between (32a) and (32b) lies in the commas in the NRRC. That is, the only way to distinguish (32a) from (32b) in a written form is to resort to the commas.

Third, in terms of relative markers, NRRCs require overt wh-relative markers to be present. The use of 'that' is normally limited to RRCs and not allowed in NRRCs.

(33) *My brother, that lives in Arizona, is named Pat.

For example, (33) is ungrammatical because of the relative marker 'that.' Its acceptable counterpart is (32b), in which 'who' is used. However, sometimes 'that' can appear in RRCs for certain stylistic reasons. For example, in 'He gazed at the yellow, stained wall with all the spots which dead bugs, that had once crawled, had left.' (Biber et al., 1999, p. 615), the relative pronoun 'that' is used for a stylistic

reason as the text in an excerpt from a fiction. Also, as mentioned above, zero relativizers, or relative omission, are not allowed for NRRCs (Bache & Jakobsen, 1980, p. 244; Swan, 2005, p. 496).

(34) a. *I poured him a glass of wine, ø he drank at once.

b. I poured him a glass of wine, which he drank at once.

For instance, (34a) is ungrammatical because of the zero relative. Its grammatical counterpart is presented in (34b), where 'which' is used instead.

2.3 Thai RCs

This section mirrors the previous section and reviews characteristics of Thai RCs with respect to the various parameters mentioned above, accessibility to relativization, and restrictiveness.

2.3.1 Typological description of Thai RCs

In this section, a description of Thai RCs is provided in terms of the parameters outlined above.

2.3.1.1 RC position, relationship between RC and matrix clause, and head position

In terms of the position of RC in relation to the head noun, Thai RCs, like their English counterparts, are postnominal or right-branching (Yaowapat & Prasithrathsint, 2008; 11). It can thus be inferred that, in terms of the relationship between the RC and the matrix clause as well as the position of the head noun, they are also embedded within their matrix clauses and have external heads. This is illustrated in (35) below.

(35) **khon [thîi khăw chɔ̂ːp ø]**

person REL 3SG like GAP

the person that he/she likes

In (35), it can be seen that the RC shown in brackets appears to the right of the head noun ‘khon.’ In addition, the RC together with the head forms a NP, which is characteristic of an embedded RC. In addition, the head noun ‘khon’ also appears outside the RC, making this RC external-headed, similar to English RCs.

2.3.1.2 Relativization strategies and relative markers

Yaowapat and Prasithrathsint (2008) state that Thai uses two strategies in forming RCs, namely the gap strategy and, more controversially, the pronoun retention strategy.

The gap strategy is the dominant strategy for relativization in Thai. That is, most RCs in Thai are formed using the gap strategy (2008; 12). For example, in (35), inside the RC in brackets, a gap is left where the missing element should be. It should be noted that ‘thîi’ is not case-marked and does not indicate the role of relativized element in the RC. Therefore, it cannot be said that (35) represents a case of the relative pronoun strategy, at least by the criteria of pronouns in typological studies, although ‘thîi’ is usually described as a relative pronoun (Iwasaki & Ingkapirom, 2005, p. 246; Suktrakul, 1975, p. 102; Upakit-Silapasarn, 1971, p. 79).

Another strategy used to form RCs in Thai is pronoun retention. Although resumptive pronouns are assumed not to exist in Thai RCs, their presence in RCs, although quite peripheral, is first acknowledged formally in Kullavanijaya (2006, pp. 41-44). However, it is in Yaowapat and Prasithrathsint (2008, pp. 14-16) that pronoun retention in Thai RCs is attested and described systematically, which will be discussed in detail under accessibility to relativization. An example is given in (36).

(36) **khăw dâay hây nɛɛwkhít [sî̂ŋ man pen pràyòot sămràp thúk khon]**

3SG PST give idea [REL 3SG COP benefit for every people]

'He gave an idea which is beneficial for everyone.'

(Yaowapat & Prasithrathsint, 2008, p. 15)

In (36), the resumptive pronoun 'man,' which is coreferential with the head '**nɛɛwkhít**,' is retained in the RC and does not result in ungrammaticality or unacceptability. However, pronoun retention seems to be restricted to RRCs (Kullavanijaya, 2006, p. 44). Yaowapat and Prasithrathsint (2008, p. 16) note further

that pronoun retention seems to be common in spoken language while rare in written texts.

Within these two strategies, Thai employs three main relativizers: ‘thîi,’ ‘sɨ̂ŋ,’ and ‘ʔan.’ Examples of these relativizers in use are shown below in (37-39) respectively.

(37) mɛɛ [thîi yùu chiaŋmày] sàʔbaay dii máy

mother [REL stay Chiangmai fine good Q

‘Is (your) mother who lives in Chiangmai fine?’

(38) khăw tɔ̂ŋkaan khon [sɨ̂ŋ mii pràʔsòpkaan]

3SG want person REL have experience

‘He/She wants (to get) a person who has experience.’

(39) **nîi pen raaŋwan [ʔan yîŋyày thîisùt nay chiiwít]**

this COP prize/reward REL big/great superlatively in life

'This is the prize which is the biggest in (my) life.'

(Yaowapat & Prasithrathsint, 2008, p. 11)

The first relativizer 'thîi,' as shown in (37), literally means 'place' and has undergone grammaticalization (Kullavanijaya, 2002, cited in Yaowapat & Prasithrathsint, 2008, p. 11). It can modify both animate and inanimate NPs, whatever function they assume (Suktrakul, 1975, p. 110). The next relativizer '**sɨ̂ŋ**' is more literary but also appears in everyday conversation as well (Iwasaki & Ingkapirom, 2005, p. 246; Suktrakul, 1975, p. 103). Last of all, '**ʔan**' is a grammaticalized form of a classifier (Yaowapat & Prasithrathsint, 2008, p. 11). It is usually used to refer to non-human NPs and is found only in written language (Suktrakul, 1975, p. 103).

However, zero relativizers seem to be allowed in Thai RCs as well. In these instances, the RC is attached to the head noun without any overt relativizer (Yaowapat & Prasithrathsint, 2008, p. 16). An example is shown in (40).

(40) **thîi nîi mii ʔaacaan [ø sɔ̌ɔn dii] lăay khon**

place this have teacher [teach good] several CLF

'This place has several teachers who teach well/skillfully.'

(Yaowapat & Prasithrathsint, 2008, p. 17)

In (40), the RC '**sɔ̌ɔn dii**,' which modifies the head '**ʔaacaan**,' is not prefaced by any overt relativizer. The subject gap only appears as a zero relativizer.

2.3.2 Accessibility to relativization

Both strategies, namely the gap strategy and pronoun retention, used to form RCs in Thai appear to be able to relativize all six possible grammatical functions as in English. RCs formed by the gap strategy on each grammatical function are shown in (41), while those formed by the pronoun retention strategy are shown in (42).

(41) Thai RCs formed by the gap strategy

a. *Subject*

raw yùu nay hôŋ [thîi ø khápk**hêɛp]**

1PL stay in room [REL narrow/small]

'We are in the small room.'

(Yaowapat & Prasithrathsint, 2008, p. 13)

b. *Direct object*

klûay [thîi khăw sɨ́ ø] phɛɛŋ

banana [REL 3SG buy] expensive

'Bananas that she bought are expensive.'

(Yaowapat & Prasithrathsint, 2008, p. 10)

c. *Indirect object*

măa [thîi khun hây ʔaahăan ø] nâasŏŋsăan

dog [REL 2SG give food] pitiful

'The dog you gave some food to is pitiful.'

(Yaowapat & Prasithrathsint, 2008, p. 13)

d. *Object of preposition*

klɔ̀ŋ [thîi raw sày sôm loŋ pay khâaŋnai ø] yày mây phɔɔ

box [REL 1PL put orange down go inside] big not enough

'The box that we put oranges in was not big enough.'

e. *Genitive*

khon [thîi phĭw ø mây dii] mii bùkkhàlík mây dii

person [REL skin not good] have personality not good

'A person with a bad complexion has a bad personality'

(adapted from Yaowapat & Prasithrathsint, 2008, p. 13)

f. *Object of comparison*

khon [thîi chăn kèŋ kwàa ø] mii yáʔ

person [REL 1SG smart than] have many

'There are many people that I am smarter than'

(Yaowapat & Prasithrathsint, 2008, p. 14)

(42) Thai RCs formed by pronoun retention

a. *Subject*

thəə mây khuan kin yaa [thîi man mòtʔaayúʔ]

2SG not should eat medicine [REL 3SG expire]

'You should not take the medicine which expired'

(Yaowapat & Prasithrathsint, 2008, p. 7)

b. *Direct object*

măa [thîi khun rák man mâak] taay lɛ́ɛw

dog [REL 2SG love 3SG much] die already

'The dog which you love a lot has died.'

(Yaowapat, 2005, p. 129)

c. *Indirect object*

dèk [thîi chăn hây ŋən kɛ̀ɛ khăw] ʔaayúʔ hâa khùap

child [REL 1SG give money to 3SG] age five year

'The child to whom I gave some money is five years old.'

(Yaowapat, 2005, p. 129)

d. *Object of preposition*

khun rúucàk khon [thîi chăn phûut kàp khăw] măy

2SG know person [REL 1SG talk with 3SG] Q

'Do you know the person with whom I talk?'

(Yaowapat & Prasithrathsint, 2008, p. 15)

e. *Genitive*

phuchaay [thîi măa (khɔ̆ɔŋ) khăw nîi pay] kamlaŋ sâw

man [REL dog of 3SG run go] PROG sad

'The man whose dog ran away is sad.'

(Yaowapat, 2005, p. 129)

Although an example of an object of comparison that is relativized with the pronoun retention strategy is not given, Yaowapat and Prasithrathsint (2008, p. 19) assert that such a RC exists in Thai, although it is only marginally accepted.

2.3.3 Thai RRCs and NRRCs

There are two major accounts regarding how Thai expresses the distinction between RRCs and NRRCs. The first account was proposed by Suktrakul (1975, pp. 106-114). According the researcher, Thai RRCs are distinguished from NRRCs in that a noun classifier is added before a relativizer to add emphasis.

(43) a. **dèkphûujĭŋ khon [thîi maa mɨawaannníi] pen phîisăaw khɔ̆ɔŋ chăn**

girl CLF [REL come yesterday] COP sister of me

'The girl (the one) who came yesterday is my sister.'

b. **mɛɛrîi [thîi maa mɨawaannníi] pen phîisăaw khɔ̆ɔŋ chăn**

Mary [REL come yesterday] COP sister of me

'Mary, who came yesterday, is my sister.'

(Suktrakul, 1975, p. 106)

It is argued that (43a) is an instance of a RRC because the classifier 'khon' is added to the RC for emphasis. On the other hand, (43b) is a NRRC due to the lack of such a classifier. However, the motivation behind such a stipulation is not clarified in the original work.

The second account came from Iwasaki and Ingkapirom (2005). They claim that restrictiveness is signaled by the use of thîi, whose primary function is "to identify the head noun, or to specify a referent by separating it from other similar referents" (Iwasaki & Ingkapirom, 2005, p. 246), while NRRCs are introduced by **sŝŋ**, whose main function is "to add information" (Iwasaki & Ingkapirom, 2005, p. 247). This analysis is endorsed by Kullavanijaya (2006, pp. 49-50), who states that it can be said that Thai realizes the distinction between RRCs and NRRCs by the use of the two relative pronouns. However, this account is undermined by Yaowapat (2005, p. 124), who asserts that the two relativizers are mostly used interchangeably.

Given the fact that there seems to be no way these two analyses can be viewed as complementary, it can only be concluded that the way Thai expresses the distinction between RRCs and NRRCs remains inconclusive as of now. However, these attempts seem to indicate that at least such a distinction exists in Thai.

2.4 Similarities and differences between English and Thai RCs

The similarities and differences between English and Thai RCs are summarized in Table 4 below.

Characteristics		English	Thai
Parameters	Position of head noun	External	External
	Linkage between RC and head noun	Embedded	Embedded
	Position of RC	Postnominal	Postnominal
	Relativization strategies	Gap	Gap, pronoun retention
Accessibility to relativization		Every position	Every position
Distinction between RRCs and NRRCs		Encoded (intonation, punctuation, use of overt wh-relativizers)	Inconclusive

Table 4: A summary of the similarities and differences between English and Thai RCs

From Table 4, it can be seen that both English and Thai RCs are very similar in a number of ways. That is, both languages feature external, embedded, and postnominal RCs. In addition, all the six grammatical functions that the NP in the RC can assume are accessible to relativization in both languages. The differences seem to lie in the strategies involved, with Thai RCs allowing pronoun retention while English RCs do not, and how the distinction between RRCs and NRRCs are encoded.

Chapter 3

RC-related Hypotheses

This chapter delineates the three hypotheses related to RCs, namely the Noun Phrase Accessibility Hierarchy (NPAH), the Perceptual Difficulty Hypothesis (PDH), and the SO Hierarchy Hypothesis (SOHH). For each hypothesis, its motivations and main premises along with supporting evidence from L1 research are discussed in 3.1. Then, previous studies that attempt to link these hypotheses to SLA are reviewed in 3.2, while 3.3 is dedicated to previous works that test these three hypotheses among L1 Thai learners.

3.1 The three hypotheses related to RCs

As mentioned in Chapter 1, there are three major hypotheses that are relevant to RCs acquisition. These hypotheses are formulated on different grounds and make different predictions concerning the difficulty order of different types of RCs.

3.1.1 The Noun Phrase Accessibility Hierarchy (NPAH)

In their seminal work on relativization universals, Keenan and Comrie (1977) proposed a hierarchy that predicts the relative degree of difficulty with which each NP type is accessible to relativation based on markedness. Within this hierarchy, the factor that determines such difficulty is the grammatical function of the NP that is being relativized. The symbols used, along with examples, are repeated in Table 5 below for convenience.

Symbols	Meanings	Examples
SU	Subject	The cake that was on the table…
DO	Direct object	The cake that I ate…
IO	Indirect object	The cake that I baked you…
OPREP	Object of preposition	The cake that I put your name on…
GEN	Genitive	The cake whose lowest layer was chocolate…
OCOMP	Object of comparison	The cake that the pie was cheaper than…

Table 5: Explanations and examples for each symbol

In analyzing the syntactic forms of RCs across 50 languages in an attempt to arrive at the universal properties of RCs, Keenan and Comrie (1977) discovered that RCs can be categorized into six main types as shown in Table 5 based on the

grammatical function of the relativized NP. However, the distribution of these six types is unequal, with some exhibiting more markedness than others. That is, some RC types can be found in most languages while the others appear only in a handful. For example, while Catalan can relativize four types of RCs (subject, direct object, indirect objects, and object of preposition), English allows all the six types (Keenan & Comrie, 1977, pp. 74-80).

Keenan and Comrie (1979b) also discovered that there seem to be a pattern to the limitations on the grammatical functions that can be relativized in different languages. In other words, languages vary in terms of NP positions that can undergo relativization in a systematic way. That is, whether certain grammatical functions can be relativized is far from completely haphazard, but rather depends on whether other grammatical functions can be relativized. These dependencies are claimed to be universal and lead Keenan and Comrie to postulate the Noun Phrase Accessibility Hierarchy, repeated below for convenience in (44):

(44) SU > DO > IO > OPREP > GEN > OCOMP

The accessibility to relativization decreases from left (less marked) to right (more marked), or from higher to lower positions. That is, subject RCs are more accessible to relativization than RCs with a direct object as a gap and so on.

The three main claims of this hypothesis are that i) in every language that allows relativization, subjects have to be relativizable (Subject Relative Universal), ii) if a relativization strategy is allowed on a low position of the hierarchy, it can also apply to all the higher positions as well, and iii) for each position on the hierarchy, there are possible languages which can relativize that position, but cannot relativize any lower position with the same strategy. Each of the constraints is further explained below.

As for the first claim, it means that there is no language that prohibits the formation of subject RCs if RCs exist in that language. In other words, a RC with a relativized subject can be found in any language with RCs.

The second constraint implies that there should be no language that can relativize a certain grammatical relation in the hierarchy but cannot relativize those higher than that position. For example, if a language allows OPREP RCs (‘The cake that I put your name on’), then SU, DO, and IO relatives can also be formed, using the same strategy. This constraint also helps prevent cases in which a language with

RCs does not allow subjects to be relativized as they sit at the highest position of the hierarchy. That is, if a certain language allows relativization, regardless of the lowest position on the hierarchy that can be relativized, subjects are automatically allowed. For example, if a language allows direct object relativization (‘the cake that I ate’), subjects relatives (‘the cake that was on the table’), which are higher up the hierarchy, are automatically allowed. In addition, this constraint entails that a strategy applies to a continuous segment of the hierarchy, meaning no position can be skipped. For example, if a strategy is applicable to OPREP RCs, there will be no case where the same strategy applies to only SU and IO but skips DO. It is this constraint that makes the NPAH implicational; that is, the presence of a position on the hierarchy entails, or implicates, the presence of all the higher positions.

The last constraint helps make the hierarchy work strictly in a one-way direction; that is, while it is possible to predict the presence of other relatives higher up in the hierarchy from the presence of a certain RC, we cannot tell if the relatives lower in the hierarchy than the relative in question will also be present in that language. For example, if a language allows direct object RCs (‘the cake that I ate’), it can be predicted that subject RCs (‘cake that was on the table’) can be formed using the same strategy as subjects take a higher position than direct objects in the

hierarchy. However, we cannot infer that the same language can form a genitive RC ('the cake whose lowest layer was chocolate') with the same strategy as genitives are lower down the hierarchy than direct objects.

However, because of the presence of counterexamples in which a RC type is not permitted but certain lower positions can be relativized, Keenan and Comrie (1977, pp. 67-69) also proposed a weak form of the hierarchy. The domain of the applicability of these three constraints, while still claimed to be universal, are revised to be limited to the primary strategy, or the strategy that can be used to relativize subjects in that language. Keenan and Comrie (1977, p. 68; 1979b, p. 653) justified the modification by claiming that since subjects exhibit the highest degree of accessibility to relativization, the strategy that applies to subject is, in turn, also the most basic strategy. Therefore, if a language employs more than one strategy, these constraints will only make predictions for the strategy employed to form RCs on subjects and not the other strategies. The adjustment allows the hierarchy to maintain its validity in the face of counterexamples from Toba, Batak, Iban, Javanese, and Minang-Kabau, in which RCs can be formed on subjects and certain positions lower than direct objects, but not on direct objects themselves. Under the revised constraints, such a phenomenon can be better explained. That is, the strategies that

used to form SU relatives and other RCs types of different. Since the constraints are now restricted to the primary strategy, the constraints still hold true. Also, it is found that DO, while not directly relativizable, can be promoted to SU through passivization in order to undergo relativization (Keenan & Comrie, 1979b, p. 652), implying that DO is not entirely skipped, and the hierarchy still applies. Therefore, the NPAH still successfully maintains a degree of validity.

Keenan and Comrie (1977, p. 88) claimed that the NPAH makes correct predictions because it 'directly reflects the psychological ease of comprehension.' That is, RCs formed on lower positions are harder to understand than those formed on higher positions. While subject RCs are always among the most acceptable in any given language, RCs formed on objects of comparison are often deemed only marginally acceptable, even in English (Keenan & Comrie, 1977, p. 90).

This account also offers an explanation as to why a strategy for forming an RC on a certain position does not apply to the next lower position. If syntactic processes are accepted as ways of encoding meanings, then a strategy that encodes an easier meaning might not be able to encode a more difficult meaning, and a strategy that is used to encode a more difficult meaning does not need to be applicable to an easier meaning. This line of reasoning can be extended to explain why a strategy that

applies to a position but not the next lower one does not apply to an even lower position. That is, a strategy that cannot deal with a certain degree of difficulty is unlikely to be able to encode meanings that are even more difficult.

A piece of support for the psychological validity of the hierarchy comes from resumptive pronoun patterns. Having observed more resumptive pronouns in the lower end of the NPAH than in the higher end, Keenan and Comrie (1977, p. 92) proposed that 'pronoun retention will be used in proportion to the difficulty of the position being relativized.' Therefore, the order of pronoun retention found across languages is the reverse of the NPAH, as shown below in (45).

(45) OCOMP > GEN > OPREP > IO > DO > SU

The phenomenon supports that the difficulty does increase as one descends the NPAH, which, in turn, validates that the NPAH reflects the psychological ease of comprehension.

Another support that the NPAH represents the psychological accessibility to relativization is derived from L1 experimental studies. Using a comprehension task,

Brown (1971) and Legum (1975) found that children's comprehension of subject RCs outstripped that of direct object RCs. Similarly, Hatch (1971) found that children respond more quickly to subject RCs in comparison to RCs formed on objects. The same results manifested in production tasks as well. Valli et al. (1972) showed that French children formed subject RCs much more readily than RCs formed on objects.

The NPAH, however, has found a mixed support from works in L2. While several studies such as Doughty (1991), Gass (1979), and O'Grady (1999), showed results that were consistent with the hierarchy, a few papers, such as Flanigan (1995) and Xiao and Lu (2005), failed to fully support the hypothesis. These works will be reviewed in detail in 2.2.

3.1.2 The Perceptual Difficulty Hypothesis (PDH)

Also rooted in typology studies as the NPAH, the PDH, formulated by Kuno (1974) predicts the degree of difficulty on the ground of perceptual difficulty caused by elements that intervene the matrix clause. Unlike the NPAH that focuses on the grammatical function of the relativized material, the PDH considers the position of the RC in relation to the RC head.

Kuno (1974) observed some of the language universals proposed by Greenberg (1963) and W. P. Lehmann (1973) that RCs in VSO languages, such as Welsh in (46), tend to manifest postnominally while RCs in SOV languages, such as Japanese in (47), tend to manifest prenominally.

(46) *VSO – postnominal RC*

Dyma *'r llyfr* [y darllenais y stori ynddo].

Here-is *the book* [that I-read the story in-it]

'Here is the book in which I read the story.'

(Keenan & Comrie, 1977, p. 70)

(47) *SOV- prenominal RC*

Watasi wa [sono otoko ga tataita] *inu o* miru

I top [that man SU struck] *dog DO* see

'I see the dog which that man struck'

(Keenan & Comrie, 1979a, p. 339)

In order to explain why the syntactic arrangement of a language influences the position of RCs in relation to their head NPs in the same manner, Kuno investigated the effect of center embedded structures, first observed by Chomsky (1961).

(48) The cheese [the rat [the cat chased] ate] was rotten.[3]

(Kuno, 1974, p. 119)

In (48), both RCs appear center-embedded. That is, 'the cat chased,' which modifies 'the rat,' is center-embedded between 'the rat' and 'ate.' At the same time, 'the rat ... ate,' which modifies 'the cheese,' is also center-embedded in the matrix clause between 'the cheese' and 'was rotten.' It can be seen that (48) is barely comprehensible. This does not seem to be the case when RCs appear right-embedded.

(49) The cat chased the rat [that ate the cheese [that was rotten]].

[3] This sentence is inspired by (the rat (the cat (the dog chased) killed) ate the malt) in Chomsky and Miller (1963, p. 286) in their discussion of the effect of embedding. They argue that the sentence 'is surely confusing and improbable but it is perfectly grammatical and has a clear and unambiguous meaning.'

In (49) , the RC ‘that was rotten’ modifies and appears to the right of ‘the cheese,’ while the RC ‘that ate the cheese…’ modifies and appears to the right of ‘the rat.’ It can be seen that (49) is much more intelligible although it expresses more or less the same proposition as (48), and this seems to be due to the fact that the RCs in the sentence appear right-embedded rather than center-embedded.

The observed effect of center-embedding led Kuno (1974, p. 120) to propose that the reduced comprehensibility of center-embedded structures arises from the limited capacity of temporary memory. That is, human temporary memory system becomes more burdened and less capable of handling information when an element is inserted between existing elements and interrupts the processing of the matrix clause. For example, in (13), after having received ‘the cheese the rat the cat,’ the hearer will find it extremely difficult to pair the predicates that follow (‘chased, ate, was rotten’) to the correct nouns.

The effect of center-embedding is further demonstrated and supported in the positions of RCs in relation to their heads found in different languages.

(50) SOV with *prenominal* RCs

a. [Mary loved] *boy* died.

b. [Mary loved] *boy* Jane hated.

c. Jane [Mary loved] *boy* hated. (center-embedding)

(51) SOV with *postnominal* RCs

a. *Boy* [Mary loved] died. (center-embedding)

b. *Boy* [Mary loved] Jane hated. (center-embedding)

c. Jane *boy* [Mary loved] hated (center-embedding)

(52) VSO with *prenominal* RCs

a. Died [loved Mary] *boy*. (center-embedding)

b. Hated [loved Mary] *boy*. (center-embedding)

c. Hated Jane [loved Mary] *boy*. (center-embedding)

(53) VSO with *postnominal* RCs

a. Died *boy* [loved Mary].

b. Hated *boy* [loved Mary] Jane. (center-embedding)

c. Hated Jane *boy* [loved Mary].

(Kuno, 1974, p. 121)

Above are hypothetical examples that illustrate the word orders universals assert (50, 53) and the reverse scenarios (51, 52). Kuno (1974, pp. 121-122) asserts that the tendencies for SOV languages to have prenominal RCs, as shown in (50) and for VSO languages to have postnominal RCs, as shown in (53), might be developed to minimize the chance of center-embedding, and thus comprehension difficulty. In (50), a center-embedded RC only occurs when it modifies an object (50c), while in the other instances (15a and 15b), RCs do not appear to intervene the other elements. Similarly, in (53), only when a RC modifies a subject and the sentence allows an object does a RC become center-embedded, as in (53b). That is, a RC remains unobtrusive (as in 53a, c) as long as it does not modify a subject of a transitive verb. Simply put, the phenomenon means there is only a one third chance

that center-embedded RCs, which are perceptually taxing, will occur. On the other hand, if the situation were to be reversed and RCs were postnominal in SOV languages, as in (51), and prenominal in VSO languages, as in (52), instead, center-embedding would always result. The chance of center-embedded structures jumps to 100 %, compared to only 33% under the normal circumstances. From these examples, Kuno (1974) conjectured that the positions of RCs in relation to their heads are related to the effect of center-embedding.

With these pieces of evidence, Kuno (1974) proposed an order of difficulty of RCs based not on the grammatical function of the relativized material, but on their position in relation to the head in the matrix clause. That is, center-embedded RCs are more perceptually difficult than left- or right-embedded counterparts. Therefore, for English, the difficulty order is repeated below for convenience in (54).

(54) OS, OO, OIO, OOPREP, OGEN, OCOMP > SS, SO, SIO, SOPREP, SGEN, SOCOMP

Regardless of the grammatical function of the RC gap (the second part of each pairing), the PDH predicts that RCs that modify objects or are right-branching are easier than RCs that are center-embedded to modify subjects because the former do

not cause interruption in the processing of the matrix clause. For example, consider the following examples:

(55) I like the vase [that is on the table]. (Right-embedded)

(56) The vase [that I like] is on the table. (Center-embedded)

In (55), the RC 'that is on the table' appears at the end of the sentence and does not interrupt the matrix clause 'I like the vase.' On the other hand, in (56), 'that I like' is inserted between the subject and the predicate of the matrix clause ('The vase ... is on the table') and causes a burden to the processing.

The PDH has received support from L1 studies. Cook (1973) elicited ERCs from L1 English children and found that less accuracy was exhibited in RCs formed on subjects than those formed on objects. Prideaux and Baker (1987) analyzed written texts in L1and found a stronger tendency for RCs to be non-interrupting or right-embedded rather than center-embedded. The same results were echoed in Stauble (1978, cited in Celce-Murcia and Larsen-Freeman (1999, p. 578)), in which right-embedded RCs were found more frequently in both written texts and speech.

Similarly, the PDH is consistent with and supported by the anti-interruption principle by Slobin (1973), which posits that interruptions of a continuous linguistic unit are universally avoided because an intervening element can easily exceed the hearer's or speaker's memory span, especially when the intervening element is a complex grammatical unit such as a center-embedded relative clause.

A number of studies, such as Ioup and Kruse (1977), Schumann (1980), Sadighi and Jafarpur (1994), and Izumi (2003), have lent support to the PDH as well and will be discussed in detail under 2.2.

3.1.3 The SO Hierarchy Hypothesis (SOHH)

Unlike the NPAH and the PDH, the SOHH, formulated by Hamilton (1994), bucks the trends and considers both the grammatical function of the relativized NP and the embedding to determine the difficulty order of RCs.

To unify the two hierarchies, the notion of processing discontinuity (O'Grady, 1987), or pauses in parsing while intervening elements are being interpreted, is used to explain part of the NPAH and the PDH. The more discontinuities, the more difficult it is for that RC to be processed. Hamilton posits that processing discontinuities can be generated under two circumstances. For the NPAH, processing discontinuities are

assumed to be created by the phrasal boundaries between the relative pronoun and the *wh*-trace left behind by the relativized material, as shown in (21):

(57) a. The man who$_i$ [$_{IP}$ t$_i$ saw us] (SU)

b. The man who$_i$ [$_{IP}$ we [$_{VP}$ saw t$_i$] (DO)

(Hamilton, 1994, p. 135)

In (57a), a processing discontinuity is created where the trace left behind by the relativized material because the IP phrasal boundary separates the trace from the relative pronoun 'who.' However, in (57b), two processing discontinuities are generated by the phrasal boundaries VP and IP that separate the trace and the relative pronoun. The number of processing discontinuities created seems to mirror the hierarchy posited by the NPAH; that is, SU is easier than DO.

As for the PDH, it is posited that processing discontinuities are created when an RC appears center-embedded and intervenes the processing of the matrix clause, as shown in (58):

(58) a. The peach [$_{CP}$ that you ate] was rotten. (center-embedded or SX)

b. You ate the peach [$_{CP}$ that was rotten]. (right-embedded or OX)

In (58a), the RC is center-embedded and interrupts the matrix clause, creating one processing discontinuity. On the other hand, the RC 'that was rotten' in (58b) is right-embedded and does not disrupt the matrix clause. Therefore, no processing discontinuity is created.

The hierarchy takes into account both types of discontinuities, as shown in (59), and posits the order of difficulty between the four types of RCs considered in Hamilton (1994), namely OS, OO, SS, and SO, as shown below in (60).

(59) OS They saw the boy [$_{CP}$ who$_i$ [$_{IP}$ t_i entered the room].

(1 discontinuity: 1 within the RC, none from center-embedding)

OO A man bought the clock [$_{CP}$ that$_i$ [$_{IP}$ the woman [$_{VP}$ wanted t_i].

(2 discontinuities: 2 within the RC, none from center-embedding)

SS The man [$_{CP}$ who$_i$ [$_{IP}$ t_i needed a job] helped the woman.

(2 discontinuities: 1 within the RC, 1 from center-embedding)

SO The dog [$_{CP}$ that$_i$ [$_{IP}$ the woman [$_{VP}$ owns t_i] bit the cat.

(3 discontinuities: 2 within the RC, 1 from center-embedding)

(adapted from Hamilton, 1994, p. 134)

(60) OS < OO/SS < SO

It can be seen that the new hierarchy or the SOHH is based on the overall numbers of processing discontinuities created in each RC type. Because OS has only one such discontinuity, it is postulated to be the easiest and the earliest to acquire. Next in line with two overall discontinuities are OO and SS, although these

continuities are completely RC-internal for OO while one is caused by center-embedding in SS. Since Hamilton (1994) never pondered the possibility that the two types of discontinuities may carry equal weight, as suggested by Izumi (2003, p. 311), it is assumed that OO and SS holds the same position on the hierarchy. Last of all, SO is posited to be the most difficult among the four types because its formation generates three discontinuities altogether.

This line of reasoning has later been extended to OPREP RCs. The number of processing discontinuities created is shown in (61).

(61) The man who$_i$ [$_{IP}$ we [$_{VP}$ thought [$_{PP}$ about t$_i$]]] (OPREP)

(Izumi, 2003, p. 291)

In (61), the phrasal boundaries, namely IP, VP, and PP, cause three processing discontinuities within the RC, regardless of embedding.

Some researchers, such as Izumi (2003) and Chou (2006), have also tried to incorporate OPREP RCs and posited a new hierarchy based on the number of

discontinuities occurring, resulting in the hierarchy in (62) below (The numbers represent the number of discontinuities).

(62) OS > OO/SS > SO/OOPREP > SOPREP

1 2 3 4

The SOHH seems to lag behind the other two hypotheses in terms of support from L1 study. In fact, Hamilton (1994, p. 135) only claims that the SOHH is a strong predictor of difficulty and developmental order and has generally been supported, but fails to make any reference to any L1 studies in particular. Although it seems to be buttressed by the anti-interruption principle by Slobin (1973), the support is only vicarious or at best partial, explaining only why center-embedded RCs cause a processing discontinuity while their counterparts do not.

Support from L2 research for the SOHH has also not been vibrant. This is mainly due to the fact that the hypothesis is relatively recent and has not been able to garner as much attention as the other two centerpiece hypotheses (Izumi, 2003, p.

292). Works that lend full or partial support to the SOHH will be thoroughly reviewed in 3.2.

Table 6 below summarizes the three hypotheses discussed above.

Hypotheses	Theoretical basis	Focus	Order of difficulty
NPAH	Typological markedness	Relative clause	SU>DO>IO>OPREP>GEN>OCOMP
PDH	Short-term memory capacity	Matrix clause	OS, OO, OIO, OOPREP, OGEN, OCOMP > SS, SO, SIO, SOPREP, SGEN, SOCOMP
SOHH	NPAH, PDH, and processing discontinuity	Relative clause and matrix clause	OS > OO/SS > SO/OOPREP > SOPREP

Table 6: Summary of the three universal hypotheses related to RCs

3.2 Previous studies on ERC acquisition among non-Thai L1 learners and the three hypotheses

There has been a continuous attempt to test these three hypotheses, namely, the NPAH, the PDH, and the SOHH, in SLA. Some of the works that are related to these three hypotheses in SLA context, except those that focus solely on L1 Thai learners, to which the next section is dedicated, are discussed under this

section. Because several studies take on more than one hypothesis at a time and the results of some works seem to contribute to multiple hypotheses concurrently, these studies are not reviewed based on the hypotheses they set out to test, but rather on a chronological basis to paint the big picture of these three hypotheses from their conception to present day.

Cook (1973), already mentioned for the support it gives to the PDH from its L1 experiment, also collected data from L2 English acquiring adults elicited through a sentence imitation task. The results showed that, like the L1 children participants, their performance exhibits far less accuracy with center-embedded RCs when compared to right-embedded RCs, in line with the predictions made by the PDH, although the hypothesis has not been formed yet.

Ioup and Kruse (1977) examined adult L2 learners from different L1 backgrounds, namely Chinese, Japanese, Arabic, Persian, and Spanish, with a grammaticality judgment task to gauge their intuitions concerning the well-formedness of 36 sentences containing RCs. The results revealed that the L2 learners experienced more difficulty in identifying errors in center-embedded RCs. The levels of accuracy from high to low, inversely proportional to the degrees of difficulty,

manifested in the following order: OS > OO > SO > SS. Therefore, the results are consistent with the PDH but did not support the NPAH and the SOHH.

Gass (1979) investigated the ERC acquisition of speakers of Arabic, Chinese, French, Italian, Japanese, Korean, Persian, Portuguese, and Thai. A grammaticality judgment task and a sentence combination are used to elicit the data. The degrees of accuracy mirrored the NPAH, with genitive RCs being the only exception, appearing to be easier to all but subject RCs. It should also be noted that IO and OPREP were conflated into one category as previously explained in 1.4.1. In addition, resumptive pronouns were also found in GEN and OCOMP whether or not the learners' L1 allowed pronoun retention on those positions. The results led Gass to conclude that the NPAH influences the order of RC acquisition while L1 background does not appear to hold any sway.

Gass (1980) analyzed the frequency of RCs produced by the same subjects from her previous study in a composition task. The results indicated that 76% of RCs produced were formed on subjects while 15% are formed on objects, which partially correlates with the NPAH.

Schumann (1980) examined the frequency in the production of several RC types by seven L2 English speakers living in the United States. It was found that OS

relatives were produced with the highest frequency (53%), followed by OO (35%), SS (6%), and SO (4%) respectively. The results indicated that right-embedded RCs are preferred to center-embedded and are borne out by both Ioup and Kruse (1977) and Kuno (1974).

Tarallo and Myhill (1983) used a grammaticality judgment task to elicit judgments on RCs from L1 speakers of Chinese, Japanese, German, Persian, and Portuguese. It was found that resumptive pronouns in interlanguage (Selinker, 1972) [4] might be a universal phenomenon because resumptive pronouns in English seemed to be accepted even though they are not allowed. In addition, the order of difficulty found was SU/DO > OPREP/IO > GEN, lending only partial support to the NPAH.

Ioup (1983) set out to investigate the natural difficulty order of several complex structures, which included RCs as well. The performance of the L2 English adult learners in a sentence combination task indicated that they were more prone to errors with OS and OO than SS. Not only did the results fail to support the PDH, they also contradicted Ioup and Kruse (1977), in which the PDH was supported. The contradicting results were ascribed to the nature of the tasks in the two studies; the

[4] Selinker (1972) stated that the linguistic system of adult L2 learners differs from both the target language and the native language and thus qualifies as a separate linguistic system. Selinker coined the term 'interlanguage' to call this system.

task in the previous study was a reception task while the task in this study was a production task. It was, thus, claimed that center-embedded RCs are more difficult to process as shown in the previous study, while right-embedded RCs (OS and OO) are more susceptible to errors in production.

Pavesi (1986) investigated the effects of formal (instruction) and informal (no instruction) contexts on the acquisition of ERCs by measuring the percentage of resumptive pronouns produced by L1 Italian learners in an oral picture-cued production task. The results were generally borne out by the NPAH in both formal and informal groups, with resumptive pronouns found being proportional to the difficulty order predicted. That is, errors involving resumptive pronouns in SU RCs barely manifested and generally increased as the RC type descends the NPAH. However, the formal group outperformed the informal group when it came to the lower positions. In addition, there seemed to be tendency for IO and OPREP, and OCOMP and GEN to swap their orders.

Eckman et al. (1988) examined four groups of adult L2 English learners to explore the effect of instruction of the ERC acquisition using a sentence combination task. While the effect of instruction was unclear, the results revealed that the NPAH

was confirmed as most groups produced the fewest errors on SU, followed by DO and OPREP respectively.

Iwami (1991) explored the relationship between RC types, proficiency levels, and accuracy rates in L1 Japanese L2 English learners using five different tasks. The results showed that RC types influence accuracy considerably; OS was the easiest, while SS and OO had the same level of difficulty and SO was the most difficult among these four RC types. The order of difficulty found supported all three hypotheses. In addition, it was found that the accuracy also increasesd as the level of proficiency increased.

Yip and Matthews (1991) analyzed written works by English major students in Hong Kong and found that they could readily form RCs on subjects, as predicted by the NPAH. However, avoidance of the other RCs types was evident, implying that they did know the structures but were unable to use them spontaneously.

Flanigan (1995) examined the acquisition of SS, SO, OO, and SO RCs in young L2 English learners from various L1 backgrounds (Arabic, Chinese, Hebrew, Icelandic, Indo/Malay, Korean, Sinhalese, and Spanish). Data from a comprehension task and a production tasks revealed that their performance was ordered as follows: OS > OO > SS > SO, confirming the PDH that center-embedded RCs are more difficult than right-

embedded ones. In addition, it was also found that the subjects performed better in a comprehension task, and the higher level of proficiency correlated with more accuracy.

Izumi (2003) reviewed previous works on the NPAH, the PDH, and the SOHH extensively and set out to test all three of them. The subjects were L2 English learners from various L1 backgrounds (Arabic, Chinese, French, Japanese, Kazah, Korean, Persian, Polish, Portuguese, Spanish, Thai, and Turkish). Both receptive (interpretation task and grammaticality judgment task) and productive (sentence combination task) were used. The research limited its RC types to SS, SO, SOPREP, OS, OO, and OPREP. It should also be noted that this was one of the first studies to extend the SOHH to include other types of RCs other than SU and DO. The results showed that, on the whole, the order of difficulty could be predicted by both the position of the RC in the matrix clause as posited by the PDH and the grammatical function that RCs are formed on as postulated by the NPAH. However, the SOHH was only partially supported. It was also proposed by Izumi (2003) that the NPAH and the PDH should be viewed as complementary, rather than competing, hypotheses. That is, the RC acquisition path can be consistent to both hypotheses at the same time.

The 21st century has seen an explosion in the number of studies conducted with L1 Chinese learners that test the three hypotheses in relation to ERC acquisition. C. S. Chen (2004) investigated errors in ERCs produced by high school student in Taiwan in a sentence combination task and a translation task. The results appeared to support the PDH, with order of difficult as follows: OS > OO > SS > SO, indicating that center-embedded RCs caused more difficulty than right-embedded RCs.

J. J. Chen (2004) looked into the frequencies of different RC types in compositions written by 102 university students of English major. It was found that the order of frequency reflected the order of the difficulty predicted by the PDH and was identical to C. S. Chen (2004).

Hsin and Wang (2005), similar to Izumi (2003), aimed to test the NPAH, the PDH, and the SOHH, using data from L1 Chinese high school students elicited through a sentence comprehension test and a sentence combination test. The results lent full support to the PDH and the NPAH in that right-embedding RCs were found to be easier and the order of difficulty appeared to echo the NPAH: SU > DO > OPREP.

Chou (2006) also set out to test the three hypotheses and conducted research on 84 university students. Data elicited through a sentence combination task, a translation task, and a grammaticality judgment task revealed that the

acquisition order was largely restrained by the NPAH, except in the grammaticality judgment task.

Therefore, it can be seen that the NPAH and the PDH have gained quite substantial support throughout the years while the SOHH has yet to receive equal attention. Also, a number of studies have shown that the NPAH and the PDH should not be seen as competing hypotheses, but rather as hypotheses that complement each other, as proposed by Izumi (2003).

The studies discussed above are summarized below in Table 7.

Studies	Findings	Hypothesis supported	Instruments	Order of acquisition
Cook (1973)	- L1 English children and L2 English adult learners exhibit less accuracy with center-embedded RCs than with right-embedded RCs.	PDH	Imitation task	Not posited
Ioup & Kruse (1977)	- Center-embedding is the most significant variable in RC processing.	PDH	Grammaticality judgment task	OS > OO > SO > SS
Gass (1979)	- The NPAH is observed, except GEN. - Resumptive pronouns are common in GEN and OCOMP regardless of L1 background - It is language universals, such as the NPAH, and not L1, that affect the order of acquisition.	NPAH	Grammaticality judgment task and sentence combination task	SU/GEN > DO > IO&OPREP > OPREP > OCOMP

Gass (1980)	- Subject RCs are used more frequently than object RCs in writing.	NPAH	Composition task	SU>DO
Schumann (1980)	- Right-embedded RCs are produced at a greater frequency than center-embedded RCs.	PDH	Spontaneous speech production task	OS > OO > SS > SO
Tarallo & Myhill (1983)	- Resumptive pronouns in interlanguage are universal. - RCs formed on subjects and direct objects are easier than those formed on OPREP and IO, and on GEN respectively.	NPAH partially	Grammaticality judgment task	SU/DO > OPREP/IO > GEN
Ioup (1983)	- Center-embedded RCs cause more processing difficulty while errors are produced more on right-embedded RCs	-	Sentence combination task	SS, SO > OS > OO
Pavesi (1986)	- The difficulty order generally conforms to the NPAH, with minor switch-ups in lower positions. - Instruction contributes to the acquisition of ERCs.	NPAH partially	Production task	SU > DO > OPREP > IO > OCOMP > GEN
Eckman, Bell, and Nelson (1988)	- The instruction of a lower position does not always improve the acquisition of all the higher positions. - RCs formed on subjects are easier than those formed on direct objects and objects of preposition.	NPAH	Sentence combination task	SU > DO > OPREP
Iwami (1991)	- RC types affect accuracy. - Accuracy and proficiency develop in the same direction	NPAH, PDH, SOHH	Constituent binding task, receptive translation task, sentence completion task, sentence combining task,	OS > SS/OO > SO

			productive translation task	
Yip & Matthews (1991)	- Subject RCs are the easiest and have the highest frequency. - Students know the other RC types but avoid them.	NPAH	Written sentence analysis	SU > other types
Flanigan (1995)	- Center-embedding is the most significant variable in RC processing. - Comprehension task	PDH, SOHH partially	Comprehension task, sentence combination task	OS > OO > SS > SO
Izumi (2003)	- The NPAH and the PDH are the best predictor of L2 acquisition of RCs. - The NPAH and the PDH can be seen as complimentary to each other.	NPAH, PDH, SOHH partially	Sentence combination test, interpretation test, grammaticality judgment test	Sentence combination task OS > OO > OPREP > SS > SO > SOPREP Interpretation test OS > OOPREP > OO > SS > SOPREP > SO Grammaticality judgment test OS > SS > OPREP > OO > SO > SOPREP
Chen, C. S. (2004)	The PDH is generally confirmed	PDH	Sentence combination task, translation task	OS > OO > SS > SO
Chen, J.J. (2004)	The NPAH and the PDH are generally confirmed.	NPAH, PDH	Composition analysis	OS > OO > SS > SO
Hsin & Wang (2005)	- Right-embedded RCs are significantly easier than center-embedded RCs. - The PDH holds true.	NPAH, PDH	Sentence comprehension task, sentence combination task	SU > DO > OPREP

Chou (2006)	The NPAH holds the most influence on the order of acquisition.	NPAH partially	Sentence combination task, translation task, grammaticality judgment task	Sentence combination task SU > GEN > DO > OPREP > IO > OCOMPT Translation task SU > DO > GEN > OPREP > IO > OCOMP Grammaticality judgment task IO > GEN > OCOMP > DO > OPREP > SU

Table 7: Summary of previous studies on the NPAH, the PDH, and the SOHH in the acquisition of ERC (adapted from Izumi, 2003, pp. 293-4 and Peng, 2008; pp. 32-35, 38-39)

3.3 Previous studies of ERC acquisition among L1 Thai learners

While ERCs are a subject of numerous SLA studies and the acquisition of the structure by learners of different L1 backgrounds has been well observed as demonstrated above, only a handful focuses mainly on data from L1 Thai learners. (Works that include L1 Thai learners as subjects among other L1 learners and have been covered in the previous section will not be reviewed here.)

The most comprehensive among these works is Phoocharoensil (2009). The study examined the extent to which ERC acquisition in L1 Thai learners conformed to the NPAH and the PDH as well as the influence of L1 Thai on ERC acquisition. The scope of the research included both RRCs and NRRCs. Based on the analysis of data elicited from 90 L1 Thai students using a descriptive essay task, a descriptive speaking task, and a translation task, the study found that the ERC acquisition path appeared to be in line with the predictions of the NPAH and the PDH. That is, subject RCs were acquired first, followed by direct-object, object-of-preposition, and genitive RCs respectively. In addition, right-embedding RCs, predicted to cause less perceptual difficulty by the PDH, were found more prevalent than center-embedding RCs in the production of the low-proficiency subjects, implying that the trajectory of ERC acquisition in the learners' interlanguage developed in accordance with the PDH. It was also found that problems that the learners face in acquiring ERCs could be ascribed to L1 transfer, influence of previous instruction, overgeneralization, and avoidance.

Not only is this research one of the first studies that link ERC acquisition in L1 Thai learners to the NPAH and the PDH, the data elicited also included both RRCs and NRRCs, rendering this research one of the very few, if not the only, works that

take NRRCs into account and attempt to establish a link between the NPAH and the PDH to NRRCs. That is, NRRCs in L1 Thai learners seemed to develop under the influence of the two universals as did RRCs. However, NRRCs did not receive the same emphasis given to RRCs. This is evident in the discussion of the results, in which NRRCs were mentioned only in relation to the acquisition of the relative marker *that*. In addition, in discussing the results in relation to the two hypotheses, the study presented RCs as a whole rather than compared the data on RRCs and NRRCs. This is probably due to the fact that the tasks focused on production rather than reception, which made it nearly impossible to elicit a symmetric set of data of RRCs and NRRCs. In fact, NRRCs accounted for less than 10 percent of all the RCs in the elicited data across all three tasks (Phoocharoensil, 2009, pp. 169, 202).

Phoocharoensil (2011) examined resumptive pronouns in the interlanguage of low- and high-proficiency L1 Thai learners. The results were partly borne out by the Resumptive Pronoun Hierarchy (Keenan & Comrie, 1977), which postulates that resumptive pronouns are found more frequently in an inverse order of the NPAH, in that resumptive pronouns appeared more frequently in DO relatives than in SU counterparts. This frequency was found to diminish as the proficiency level increased. Also, since pronoun retention is disallowed in Thai, as claimed by this

study, the number of resumptive pronouns produced by the learners, while existing, was considerably smaller than that produced by learners whose L1 made use of pronoun retention. It was also posited that pronoun retention, which is claimed by this study to be disallowed in Thai, was used as a strategy to clarify the meaning of ERCs.

Since the Resumptive Pronoun Hierarchy is formed on the bases of markedness and the NPAH (that is, the more marked a RC type is, or the lower the position on the NPAH, the more frequently resumptive pronouns are found (Keenan & Comrie, 1977)) and was confirmed in the study as mentioned above, the study gave a vicarious support to the NPAH. In other words, because the Resumptive Pronoun Hierarchy and the NPAH hinge upon the same markedness order, the validity of the NPAH is also supported if the Resumptive Pronoun Hierarchy holds true.

Amornwongpeeti and Pongpairoj (2013) investigated the acquisition of ERCs by L1 Thai learners of three different proficiency levels using a grammaticality judgment test. The results showed that, with increasing English proficiency, the Thai subjects were more accurate in judging the grammaticality of ERRCs, indicating that ERCs were attainable for L1 Thai learners. This is stipulated to be due to the fact that

the features required in the formation of ERCs, including a *wh*-movement, also exist in L1 Thai and thus have already been activated in the mental representation of L1 Thai speakers.

Similar to most studies on ERC acquisition, the scope of this research was restricted to RRCs. Also, the pursuit of the research was to relate the acquisition of ERCs to the Failed Functional Feature Hypothesis (FFFH) rather than to focus on the interaction between the different RC types and the acquisition of the structure in learners with different proficiency. Therefore, while the study shed light on the acquirability of RCs among L1 Thai learners, it did not provide any insight into the order of difficulty that can be related to the language universals.

It can be seen that research on the acquisition of ERC by L1 Thai learners is still in its inchoate state, with several gaps to bridge, such as the limited variety of tasks used to elicit data and the deficit of attention paid to less prototypical RCs. More specifically, one such gap lies in the asymmetry in the number of studies dedicated to RRCs and NRRCs is evident. The gap in the body of research warrants a more thorough and systematic investigation of the relationship between NRRC acquisition and the three language universals.

Chapter 4

Methodology

This chapter describes the research questions and the methodology used in the current study and is divided into sections, namely subjects, research instruments, data collection, and data analysis

4.1 Subjects

The subjects were 40 L1 Thai undergraduate students in the first and second semesters of academic year 2012 from various faculties (Law, Engineering, Medicine, Education, and Arts) at Chulalongkorn University at the time of the experiment. They were recruited by the teachers who taught the courses and participated voluntarily.

The subjects were divided into two proficiency groups, namely intermediate and advanced, on the basis of their scores on the Oxford Placement Test (Allan, 1992), a proficiency test featuring 100 grammatical test items. Those scoring in the range of 60 to75 out of 100 were placed in the intermediate group, and those scoring higher than 75 were put in the advanced group. The average ages of the

intermediate and advanced groups were 18.15 and 18.40 respectively (for individual information, see Appendix A).

It should be noted that learners with low proficiency were not included as they might not have had a sufficient grasp on the target structures in the study and thus might yield random and invalid results.

In addition, five native English speakers, all of whom were English teachers with Bachelor's degrees, were included as a control group and asked to complete the OPT as well. Their average age was 26.2 (for individual information, see Appendix B).

Details of the three groups, their average ages and scores on the OPT are described in Table 8.

Groups	Numbers	Average ages	Score ranges	Average scores
Intermediate	20 (7 from Law, 7 from Engineering, 5 from Medicine, and 1 from Education)	18.15	60-75	66.55
Advanced	20 (6 from Law, 5 from Engineering, 5 from Med, 4 from Arts)	18.4	Above 75	80.75
Control	5	26.2	-	96.2

Table 8: The numbers of subjects, the average scores, and the standard deviations of the three groups

4.2 Research instruments

Under this section, the first half is dedicated to the two tasks used to collect data in the current study, while the second half describes the procedure undertaken to validate the tests before the actual administration.

4.2.1 The tasks

As production tasks had been heavily used in previous studies as reviewed in Chapter 3 (see 3.2 and 3.3), this study opted for a combination of both production

and reception tasks, with an emphasis on the latter, to shed new light on the acquisition of English RRCs and NRRCs by L1 Thai learners. These reception tasks employed in this research were a sentence interpretation task and a grammaticality judgment task.

4.2.2.1 Sentence interpretation task

In order to measure the subjects' comprehension of each type of RC, a sentence interpretation task, which is a reception task, was used. Some of the previous studies that employed this type of task include Izumi (2003) and Chou (2006).

For each item, a sentence containing an RC was given, along with two statements that required the subject to judge as either inferable or not inferable from the given sentence. An example is given below in (63).

(63) The hamster that I kept was called Tyler.

_____ I also kept some other hamsters.

_____ I kept this hamster.

The sub-items were designed in a way that tested the subjects' comprehension of both the differences in implication between RRCs and NRRCs and the relationship between the RC and the matrix clause. For instance, the first statement in (63) is false because the RRC *that I kept* specifies that there was only one hamster that this person kept, while the second statement is true because the RC *that I kept* modifies *The hamster*, which is an element of the matrix clause.

All the instances of RCs were designed so that their heads were uniformly definite singular nouns in order to keep the variants constant.

The test featured altogether 44 items, distributed across different combinations of RC types and relativizers as shown in Table 9 below. Any combinations that resulted in ungrammaticality were excluded from the test and represented with a dash in the table. In addition, there were two items for each grammatical combination included in the test.

RC types	Relativizers	RRC	NRRC
SS	Wh-operator	2	2
	That	2	-
	Null	-	-
OS	Wh-operator	2	2
	That	2	-
	Null	-	-
SO	Wh-operator	2	2
	That	2	-
	Null	2	-
OO	Wh-operator	2	2
	That	2	-
	Null	2	-
SOPREP	Wh-operator	2	2
	That	2	-
	Null	2	-
OOPREP	Wh-operator	2	2
	That	2	-
	Null	2	-
Total numbers		32	12

Table 9: The distribution of items in the sentence interpretation task

Each correct sub-item was worth one point while incorrect answers received no point. Each item thus held two points, making each combination carry the

maximum score of two points and yielding the maximum score of 88 for the entire test.

While the resulting distribution might be askew, with NRRCs accounting for only a little over a quarter of the whole task, the existence of such an asymmetry seemed to be more justified than a task that tested on RRCs that forsook *that* complementizers and null operators for sake of balance in that it represented the real proportion of the possible combination patterns.

The test items were arranged in such a way that no two adjacent test items featured exactly the same RC type and relativizer combination. They were also asked not to go back and change the answers they had already given so as to elicit responses that were as spontaneous, and thus natural, as possible.

The subjects were given 45 minutes to complete the task. Two practice items were also given before the real test to help them understand the instructions better. They were also allowed to ask any questions they might have regarding the instructions (see Appendix C).

4.2.2.2 Grammaticality judgment task

A grammaticality judgment task was also employed as part of the study. This type of task seems to have enjoyed considerable popularity in previous studies of similar nature, including Ioup and Kruse (1977), Gass (1979), Izumi (2003), and Chou (2006).

For each item on the test, a complete sentence was given. The subjects were asked to judge whether or not the sentence was grammatical and to identify how certain they were of the answer, as well as to provide a correction if that sentence was deemed to be incorrect. They were to put A if they believed the sentence was definitely correct, B if the sentence was probably correct, C if the sentence was probably incorrect, and D if the sentence was definitely incorrect. An example is given below in (64).

(64) _____ The bus he got on was almost empty.

For example, in (64), the subjects should judge the sentence as correct because a null relativizer is allowed in a non-subject RRC. If this sentence was deemed as definitely correct, then the subjects should write A.

Similar to the first task, the head of the RC in each item was a definite singular noun. In addition, the subjects were also informed that errors regarding spelling, tense, and punctuation were not part of the test.

The test consisted of a total of 120 items, distributed across different combinations of RC types, relativizers, and error types, namely those involving *that*-complementizer and null relativizers in NRRCs as well as those regarding resumptive pronouns and doubly-filled CPs in both RRCs and NRRCs, as shown in Table 10 below. It should be noted that there were two items for each combination and ungrammatical items are represented with italicized numbers.

RC types	Relativizers	RRC	NRRC
SS	Wh-operator	*2*	*2*
	That	2	*2*
	Null	*2*	*2*
	Resumptive pronoun	*2*	*2*
	Doubly-filled CP	*2*	*2*
OS	Wh-operator	2	2
	That	2	*2*
	Null	*2*	*2*
	Resumptive pronoun	*2*	*2*
	Doubly-filled CP	*2*	*2*
SO	Wh-operator	2	2
	That	2	*2*
	Null	2	*2*
	Resumptive pronoun	*2*	*2*
	Doubly-filled CP	*2*	*2*
OO	Wh-operator	2	2
	That	2	*2*
	Null	2	*2*
	Resumptive pronoun	*2*	*2*
	Doubly-filled CP	*2*	*2*
SOPREP	Wh-operator	2	2
	That	*2*	*2*
	Null	2	*2*
	Resumptive pronoun	*2*	*2*
	Doubly-filled CP	*2*	*2*
OOPREP	Wh-operator	2	2
	That	2	*2*

	Null	2	*2*
	Resumptive pronoun	*2*	*2*
	Doubly-filled CP	*2*	*2*
Total numbers		60	60

Table 10: The distribution of items in the grammaticality judgment task

As for scoring, there were two separate score rubrics for grammatical and ungrammatical sentences as shown in (65).

(65) *For grammatical sentences:*

A (definitely correct) = 3

B (probably correct) = 2

C (probably incorrect) = 1

D (definitely incorrect) = 0

For ungrammatical sentences, the scoring was the reverse.

A (definitely correct) = 0

B (probably correct) = 1

C (probably incorrect) = 2

D (definitely incorrect) = 3

Therefore, the maximum point possible for each item was three, and the maximum point possible for each relative clause type was six. The highest score possible for the entire test totaled 360 points. In addition, while the corrections provided were not counted towards scoring, they served as production data and were used to help explain what was found in the reception data.

Because of the number of test items required to cover all the factors within the scope of the current study, no decoy was included. This was to keep the task as lean and manageable as possible.

In addition, the test items were arranged so that no two adjacent items tested the same structure, and the participants were asked not to change any answers already given as in the previous task.

The subjects were given 60 minutes to finish the task. Similar to the sentence interpretation task, they were given clear instructions from the teachers supervising the session and provided with three warm-up items for them to practice with. They were also encouraged to inform the teachers of any part of the instructions they felt had to be further clarified (see Appendix D).

4.2.2 Validity test

It should also be added that prior to the administration, both tests were verified for their content validity using the Index of Item-Objective Congruence (IOC), developed by Rovinelli and Hambleton (1976) and widely used to assess whether test items can adequately measure the knowledge or abilities they set out to measure. Each test item was rated by three experts, who either gave one point if the item was deemed congruent with the objectives of the tests, zero point if the experts did not think the item could be judged as either congruent or incongruent with the objectives of the tests, or minus one point if the item was judged as incongruent with the objectives of the tests. For each item, the scores given by the three experts were added and divided by the number of experts according to the formula illustrated below in (66).

(66) $IOC = \frac{\Sigma R}{N}$

ΣR = the sum of the experts' scores

N = the number of experts

Each item had to score higher than 0.5 to be deemed as capable of measuring the objectives of the test. All of the items that appeared on the tests administered to the subjects passed the IOC, with the sentence interpretation task scoring 0.917 on average and the grammaticality judgment task scoring 0.906 on average. The IOC scores of individual items are provided in Appendix E.

4.3 Data collection

After the OPT had been administered and 40 participants had been categorized into the intermediate and advanced groups based on their scores, the two tasks were given in class. Because of the time the tasks required, the tests were administered one week apart rather than back to back, with the sentence

interpretation administered first and the grammaticality judgment task given a week later. They were also clearly informed that these tests were not part of the courses they were taking and, thus, carried no score in order to remove the pressure to get good scores. After the participants finished each test in the allotted time, they were asked to turn it in immediately.

4.4 Data analysis

After the tests were scored, all the scores were calculated into percentage scores. Because of the asymmetries between the numbers of RRC and NRRC items in the first task and the ratios of correct and incorrect RRC and NRRC items in the second task as discussed above, data analysis was conducted based on these percentage scores rather than raw scores.

Chapter 5

Data analysis and findings

This chapter presents the results of the experiment described in Chapter 4 and discusses the extent to which they were consistent with the hypotheses of the study. The two sections present the results of Tasks 1 and 2, respectively. Each of these sections is divided into subsections so as to allow a close scrutiny on the data.

5.1 Task 1: Sentence interpretation task

In this section, the subjects' accuracy scores on RRCs and NRRCs in Task 1 are presented and then arranged from highest to lowest to observe the degrees of difficulty of each RC type in different subject groups. The scores are then further analyzed to determine the extent to which they support or contradict claims made by the three RC-related hypotheses presented in Chapter 3 and whether RRCs and NRRCs interact with these three hypotheses in the same manner. Finally, the scores will also be scrutinized on the basis of relativizers in order to shed some more light on the differences in the acquisition of RRCs and NRRCs. It should also be noted that

in order to keep the focus on the learners' data, the scores of the control group will be presented only in the overall score section.

5.1.1 Overall scores

The overall scores of items on RRCs and RRCs sorted by subject groups are presented in Table 11 below. It should be noted that each percentage in parentheses represents the difference between the number in that cell and the cell above and therefore the difference between the accuracy score of the same RC type between two adjacent groups.

Groups/RC types	RRCs	NRRCs
Intermediate	85.63%	82.92%
Advanced	90.28% (+4.65%)	87.50% (+4.58%)
Control	95.28% (+4.65%)	95.00% (+7.50%)

Table 11: Average accuracy scores on RRCs and NRRCs of the three groups in the sentence interpretation task

For RRCs, the average accuracy score of the intermediate group stood at 85.63%, which was 4.65% lower than that of the advanced group, which was 90.28%. The control group scored the highest among the three groups at 95.28%, also 4.65% higher than the average score of the advanced group.

As for items testing NRRCs, the lowest average accuracy score also belonged to the intermediate group (82.92%). The advanced group came in second at 87.50% (4.58% higher than the score of the intermediate group), and the control group ranked the highest at 95.00% (7.50% higher than the score of the advanced group).

For both RRCs and NRRCs, there seemed to be a strong proficiency-related trend, with the intermediate group scoring the lowest, the advanced group coming in second, and the control group scoring the highest.

When a comparison between RRCs and NRRCs was made, another clear trend emerged. That is, every group exhibited lower average scores on NRRCs, as illustrated in Figure 1 below, in which the line representing NRRC remained under the line representing RRC across the three subject groups.

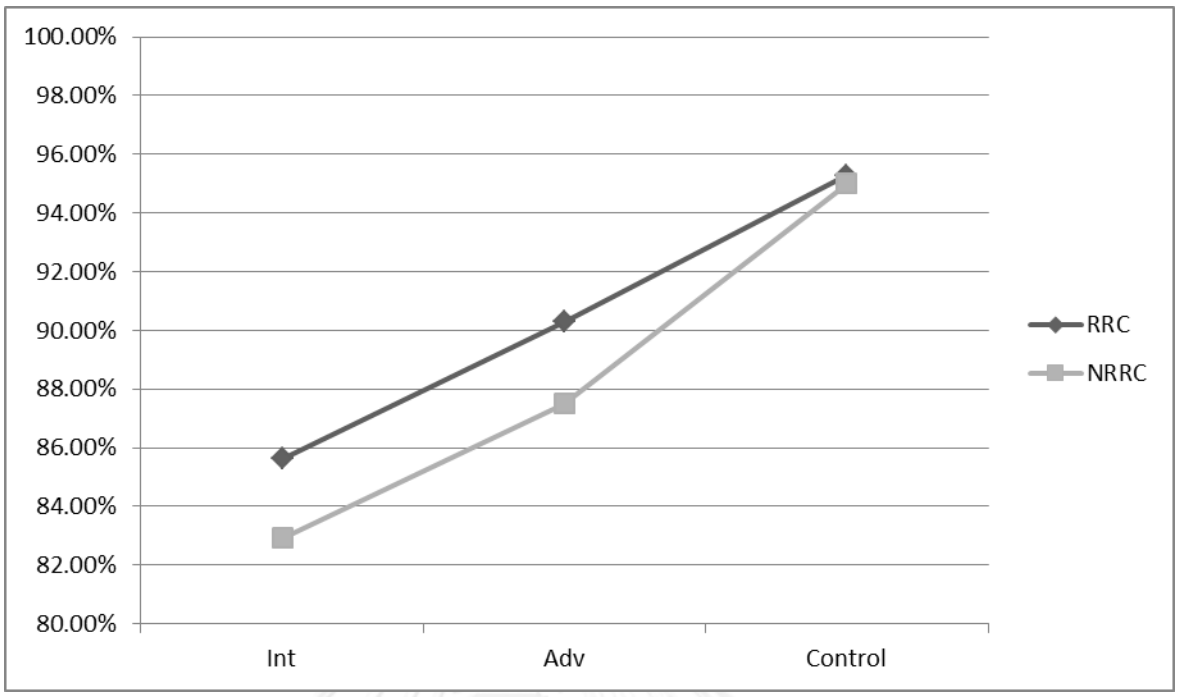

Figure 1: Progression of scores on RRCs and NRRCs across the three subject groups in the sentence interpretation task

5.1.2 Detailed scores and orders of difficulty

In order to illustrate a more detailed picture of the trends mentioned above, the scores were broken down by RC subtypes and arranged into orders. The scores on RRC subtypes by the learner groups are presented in Table 12 below.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	89.38%	91.88%	85.83%	87.08%	80.42%	79.17%	85.63%
Advanced	95.00% (+5.62%)	93.75% (+1.88%)	89.58% (+3.75%)	90.83% (+3.75%)	85.42% (+5.00%)	87.08% (+7.29%)	90.28% (+4.65%)

Table 12: Accuracy scores on each RRC subtype of the learner groups in the sentence interpretation task

The intermediate group seemed to find OS (91.88%) and SS (89.38%) the easiest two while they were less accurate with OO (87.08%), SO (85.83%), SOPREP (80.42%), and OOPREP (79.17%), respectively.

A little switch-up in the order of accuracy scores could be seen in the advanced group. SS (95.00%) appeared to be the easiest, followed by OS (93.75%), OO (90.83%), SO (89.58%), OOPREP (87.80%), and SOPREP (85.42%), respectively. It should also be noted that the advanced group scored higher than the intermediate group did on every RRC subtype, with the biggest increase evident in OOPREP (+7.29%) and the smallest increase in OS (+1.88%)

The orders of accuracy scores of the two learner groups arranged from highest (left) to lowest (right) described above are illustrated schematically below in (67). The 'greater than' symbol (>) means that the score of the subtype on the left of the symbol is greater than that on the right, and the equal symbol (=) means that the scores of the subtypes on both sides of the symbol are equal.

(67) Accuracy scores on each RRC type arranged from highest to lowest

Intermediate group:

OS	>	SS	>	OO	>	SO	>	SOPREP	>	OOPREP
(91.88%)		(89.38%)		(87.08%)		(85.83%)		(80.42%)		(79.14%)

Advanced group:

SS	>	OS	>	OO	>	SO	>	OOPREP	>	SOPREP
(95.00%)		(93.75%)		(90.83%)		(89.58%)		(87.08%)		(85.42%)

It can be seen that the orders of both groups were not identical. However, there seemed to be an underlying pattern, with XS (X representing any grammatical role of the head noun of the RC) assuming the top two highest ranks, XO taking the next two, and XOPREP occupying the two lowest slots. These orders, along with those on NRRCs discussed below, will be further analyzed in the next section below.

As for the NRRC, the scores on each subtype of the three groups are presented in Table 13 below.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	87.50%	85.00%	82.50%	81.25%	82.50%	78.75%	82.92%
Advanced	92.50% (+5.00%)	88.75% (+3.75%)	87.50% (+5.00%)	86.25% (+5.00%)	86.25% (+3.75%)	83.75% (+5.00%)	87.50% (+4.58%)

Table 13: Accuracy scores on each NRRC subtype of the learner groups in the sentence interpretation task

The table shows that the intermediate group found SS by far the easiest among the six subtypes (87.50%), followed by OS (85.00%), SO and SOPREP (82.50%), OO (81.25%), and OOPREP (78.75%), respectively.

Similarly, SS (92.50%) and OS (88.75%) were ranked the two top subtypes that the advanced group found easiest, followed by SO (87.50%). The order started to diverge from that of the intermediate group at the fourth place, jointly assumed by OO and SOPREP (86.25%), before ending with the same least accurate subtype OOPREP (83.75%). It should be noted that the advanced group scored higher than the intermediate group on every subtype of NRRC, with the increase of 3.75-5%.

The accuracy scores were also organized into high-to-low orders as illustrated below in (68).

(68) Accuracy scores on each NRRC type arranged from highest to lowest

Intermediate group:

SS	>	OS	>	SO	=	SOPREP	>	OO	>	OOPREP
(87.50%)		(85.00%)		(82.50%)		(82.50%)		(81.25%)		(78.75%)

Advanced group:

SS	>	OS	>	SO	>	OO	=	SOPREP	>	OOPREP
(92.50%)		(88.75%)		(87.50%)		(86.25%)		(86.25%)		(83.75%)

It can be seen that while both groups exhibited different accuracy orders, there seemed to be a detectable pattern, with SS, OS, and SO assuming the three top slots, SOPREP and OO taking the next two, and OOPREP sitting at the bottom.

The RRC orders shown above in (67) and the NRRC orders shown in (68) appeared to have too little in common than to make out any meaningful pattern at this stage. In addition, they did not seem to strictly follow any claims posited by the three RC-related hypotheses. This will be dealt with in the section below, where the scores are analyzed in relation to the three RC-related hypotheses to delve into the extent of the effects they have on these order.

With the scores of each subtype of RRC and NRRC already described above, Table 14 below compares them and shows the score differences between RRC and

NRRC divided by RC subtypes. Percentages indicated with a minus sign refer to differences between the RRC and NRRC in which the NRRC scores are higher.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	1.88%	6.88%	3.33%	5.83%	-2.08%	0.42%	2.71%
Advanced	2.50%	5.00%	2.08%	4.58%	-0.83%	3.33%	2.78%

Table 14: Accuracy score differences between RRC and NRRC divided by subtypes

When the scores of each subtype of RRC and NRRC were compared, most RRC subtypes had higher scores than their NRRC counterparts, with the exceptions of SOPREP for the intermediate and the advanced group (shaded in Table 13). The results demonstrated a general trend in which both learner groups were more accurate with RRC than with NRRC on most RC subtypes.

To better illustrate the trend, the scores of each RC subtype of each subject group are plotted in Figure 2 below. The unbroken lines represent RRC and the dotted lines represent NRRC.

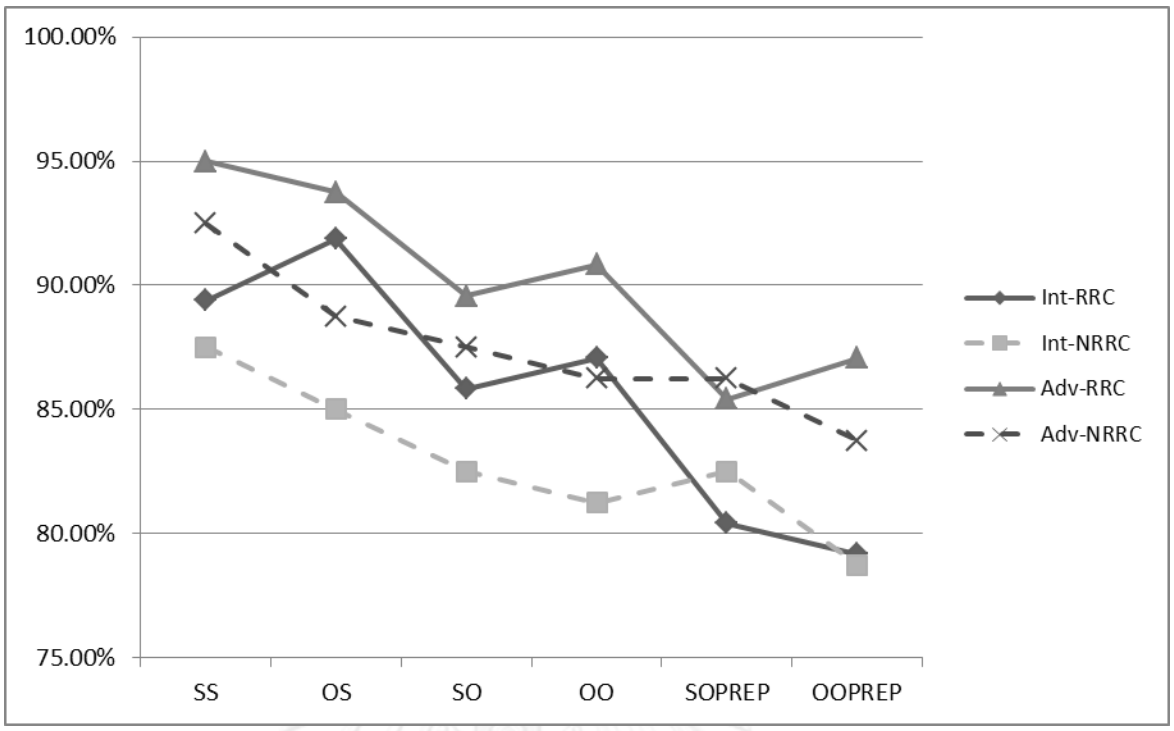

Figure 2: Accuracy scores of each RRC and NRRC subtype in the sentence interpretation task

It can be seen that the dotted line appeared to be mostly under the unbroken line of its own group except XOPREP-NRRC appearing over its RRC counterpart.

It should also be noted that the biggest score differences between RRC and NRRC of the same subtype were those of OS and OO (italicized in Table 13), suggesting that the learners might have found OS-RRC and OS-NRRC as well as OO-RRC and OO-NRRC to be more vastly different than other RRC-NRRC pairs.

5.1.3 Scores in relation to the three RC-related hypotheses

The scores were also analyzed to determine the extent to which they conformed to the predictions posited by the NPAH, PDH, and SOHH, respectively.

5.1.3.1 NPAH

The NPAH predicts that the order of difficulty is correlated with the grammatical role of the relativized material in the RC, the easiest of which is postulated to be subject, followed by direct object, indirect object, object of preposition, genitive, and objects of comparison, respectively. As the NPAH makes predictions based on the grammatical role of the gap/relativized material alone, the scores were divided into three subtypes corresponding to the three grammatical roles of the gap included in this study (namely subject, object, and object of preposition) instead of six subtypes treated in the previous section.

For RRC, the average accuracy scores categorized by the grammatical role of the gap are presented in Table 15. It should be noted that X represents the grammatical role of the RC head noun, which is irrelevant to the claims made by the NPAH. Therefore, in this study, XS refers to both SS and OS, and the scores of XS are therefore the average scores of SS and OS.

Groups/RC types	XS	XO	XOPREP
Intermediate	90.63%	86.46%	79.79%
Advanced	94.38% (+3.75%)	90.21% (+3.75%)	86.25% (+6.46%)

Table 15: Average accuracy scores on each RRC type based on the grammatical role of the relativized material

For the intermediate group, the accuracy score peaked at (90.63%) with RRC whose relativized materials function as subjects. The score tapered to 86.46% with XO and finally to 79.79% with XOPREP.

As for the advanced group, XS also ranked first in the accuracy score (94.28%), followed by XO (90.21%) and XOPREP (86.25%), respectively.

In both learner groups, a discernible trend was apparent. Subjects appeared to be the grammatical role that the participants found to be the easiest among all three, followed by objects, while objects of preposition seemed to pose most trouble to the learners.

As for NRRC, the scores based on the grammatical role of the relativized material are shown below in Table 16.

Groups/RC types	XS	XO	XOPREP
Intermediate	86.25%	81.88%	80.63%
Advanced	90.63% (+4.38%)	86.88% (+5.00%)	85.00% (+4.38%)

Table 16: Average accuracy scores on each NRRC type based on the grammatical role of the relativized material

Again, the same trend found in RRC was also manifest in NRRC, with the highest scores found in XS, the next highest in XO, and the lowest in XOPREP. For the intermediate group, the XS score was 86.25%, the XO score stood at 81.88%, and the XOPREP score plunged slightly to 80.63%.

For the advanced group, the score started out at 90.63% for XS and fell to 86.88% for XO and 85.00% for XOPREP.

In addition, although the accuracy score orders shown in (67) and (68) might not appear to strictly adhere to the NPAH, the hypothesis did appear to exert its influence on the overall ordering. The fact that some XO appeared before an XS in the actual ordering, although the NPAH posits that XS should be easier than XO, might be attributed to some other influences that could also be at play (namely perceptual difficulty and discontinuities) apart from the accessibility hierarchy. However, this did not deny the influence of the NPAH, as shown in Tables 15 and 16.

To explore whether the trend was exactly the same in RRC and NRRC, a comparison between the scores of the same grammatical role in RRC (Table 15) and NRRC (Table 16) was made. The differences are shown in Table 17 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	4.38%	4.58%	-0.83%
Advanced	3.75%	3.33%	1.25%

Table 17: Differences between RRC and NRRC in each RC type based on the grammatical role of the relativized material

When the same grammatical role was compared between RRC and NRRC, it was found subjects judged the same grammatical role more accurately in an RRC than in an NRRC, with the exceptions of XOPREP for the intermediate group. This is also illustrated in Figure 3 below.

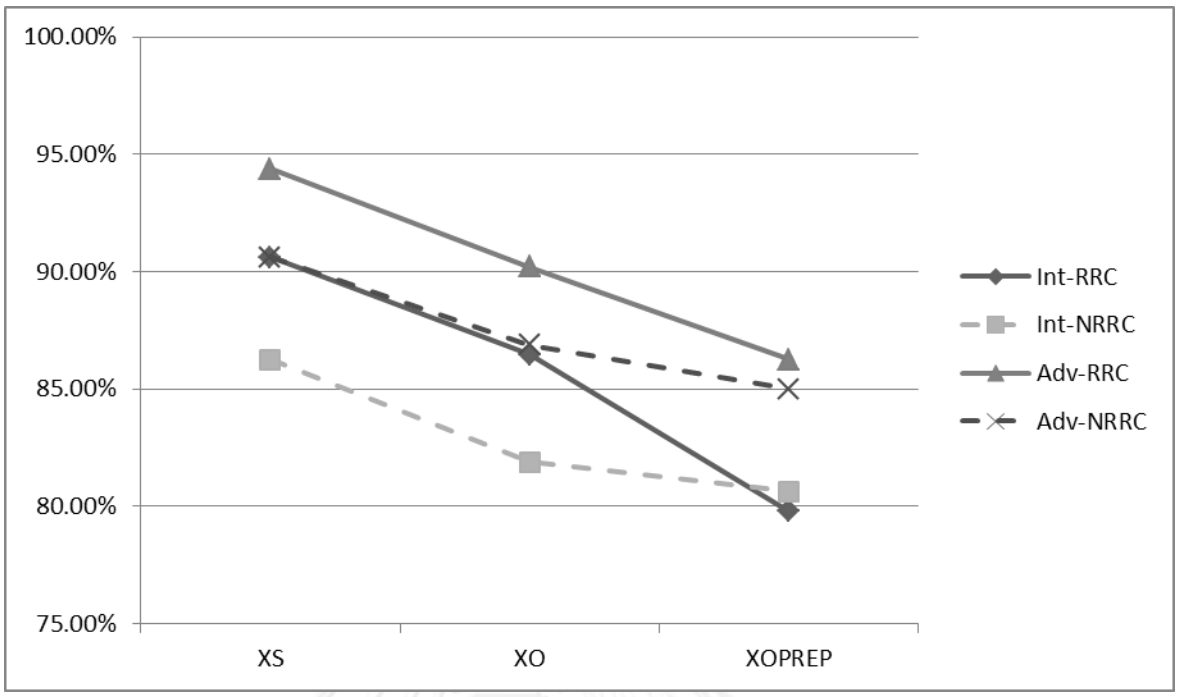

Figure 3: Progression of each RRC and NRRC type based on the grammatical role of the relativized material

The results lent support to the trend found in 5.1.1 that the subjects perceived RRCs to be easier than NRRCs even when the data was arranged on the basis of the grammatical role of the relativized material.

5.1.3.2 PDH

Disregarding the grammatical role of the relativized material, the PDH makes claims based on the position of an RC in relation to the head noun or, in other words, the grammatical role of the head of the RC. That is, an RC is more

perceptually difficult if it modifies a subject head noun in the matrix clause and separates the subject from the rest of the sentence than if that RC modifies an object head noun. Therefore, to fathom the extent of the effect of PDH in the results, the scores were divided into two subtypes based on the grammatical role of the RC head (namely subject and object).

As for RRC, the scores of each group are shown below in Table 18. It should be noted that X represents any grammatical role of the relativized material. Therefore, SX includes SS, SO, and SOPREP, and the score of SX is an average of the scores of these three subtypes.

Groups/RC types	SX	OX
Intermediate	85.21%	86.04%
Advanced	90.00% (+4.79%)	90.56% (+4.51%)

Table 18: Average accuracy scores on each RRC type based on the grammatical role of the head noun

For the intermediate group, SX stood at 85.21% while OX stood at 86.04%. For the advanced group, the SX questions were accurately answered 90.00% while the OX questions were accurately answered 90.56%.

It can be seen that the OX scores were slightly higher than the SX scores across the subject groups, leading support to the presence of the influence of the PDH in RRCs. In addition, the advanced group seemed to perform better than the intermediate groups consistently in both RC subtypes.

As for NRRC, the scores based on the grammatical role of the RC head of both learner groups are presented below in Table 19.

Groups/RC types	SX	OX
Intermediate	84.17%	81.67%
Advanced	88.75% (+4.58%)	86.25% (+4.58%)

Table 19: Average accuracy scores on each NRRC type based on the grammatical role of the head noun

For the intermediate group, the SX score was 84.17%, and the OX score was 81.67%. For the advanced group, the SX score stood at 88.75%, and the OX score stood the 86.25%.

The pattern that emerged in this set of data seemed to contradict the pattern found in RRC. That is, it appeared that subject-modifying NRRCs seemed to

be perceived as easier than object-modifying NRRCs. This went directly against the prediction of the PDH, which posits the opposite. The results, thus, suggested that the PDH might not have applied to NRRCs. Some possible reasons for this will be discussed in Section 6.4.2.

The differences between the subtypes of RRC and NRRC are shown below in Table 20.

Groups/RC types	SX	OX
Intermediate	1.04%	4.37%
Advanced	1.25%	4.31%

Table 20: Differences between RRC and NRRC in each RC type based on the grammatical role of the head noun

It can be seen that the scores of RRC were higher than those of NRRC across the board, which indicated that the two learner groups were more accurate with RRCs than with NRRCs even when the influence of the PDH was taken into account. The scores are also illustrated in Figure 4 below.

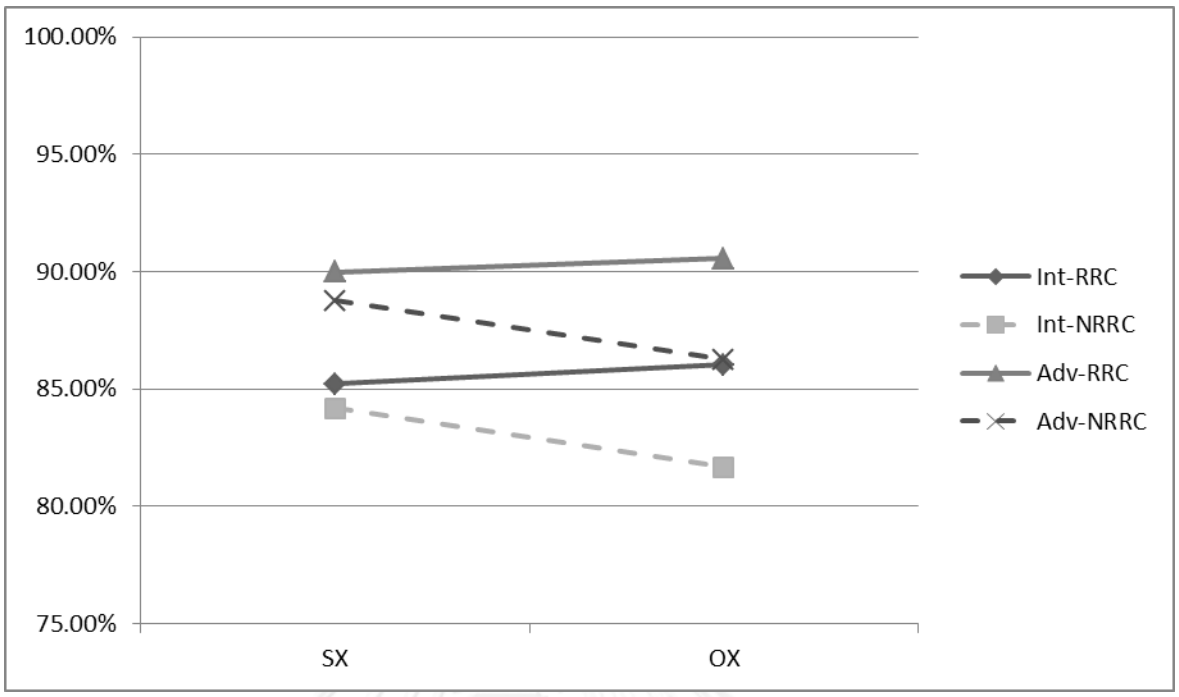

Figure 4: Progression of each RRC and NRRC type based on the grammatical role of the head noun in the sentence interpretation task

5.1.3.3 SOHH

Unlike the NPAH and the PDH, the SOHH posits its difficulty order based on the number of discontinuities created by an RC and takes into the grammatical roles of both the relativized material and the grammatical head. Under this hypothesis, the higher the number of discontinuities is, the more difficult an RC is, resulting in this order: OS > OO/SS > SO/OOPREP > SOPREP. Another distinction lies in the fact that SOHH predicts a very strict order of difficulty, dictating both grammatical roles. Because it tries to describe the effects that the grammatical roles

of both the relativized material and the grammatical head have on the difficulty order in terms of discontinuities alone, any slight deviation from the posited order and any switch-up of positions, which cannot be accounted for under this hypothesis, will suddenly contradict this hypothesis.

This strict ordering has an important implication on the way the influence of the SOHH should be observed. That is, the SOHH does not allow the average of two subtypes with the same number of discontinuities in the analysis. For example, although the average of OO and SS, both of which contain two discontinuities, appears to be lower than the score of OS, which has only one discontinuity, the results will not support the SOHH if the score of SS happens to be higher than that of OS because SS has to strictly appear after OS in the ordering. Unless an accuracy score order mirrors that posited by the SOHH, the hypothesis will be contradicted immediately. Therefore, to put it simply, for the SOHH, everything comes down to the ordering.[5] The effect of discontinuities posited under the SOHH,

[5] The same scenario does not apply to the NPAH and the PDH. Because these two hypotheses hinge upon two independent factors (the grammatical role of the relativized material and the grammatical role of the head noun.), when the order posited by one hypothesis is flouted, the hypothesis is flexible enough to allow the other hypothesis to take over and give an explanation without losing its validity. For example, if OS is easier than OO, but OO appears to be easier than SS, it does not mean that the NPAH is suddenly contradicted although SS should appear before OO. This ordering, which supports the PDH, does not entirely deny the overall effect that the

then, can be determined only by comparing the accuracy score orders with the order that the SOHH posits.

For RRC, the orders of accuracy scores are as shown above in (67) in 5.1.2, reproduced here in (69) for convenience.

(69) Accuracy scores on each RRC type arranged from highest to lowest

Intermediate group:

OS	>	SS	>	OO	>	SO	>	SOPREP	>	OOPREP
(91.88%)		(89.38%)		(87.08%)		(85.83%)		(80.42%)		(79.14%)

Advanced group:

SS	>	OS	>	OO	>	SO	>	OOPREP	>	SOPREP
(95.00%)		(93.75%)		(90.83%)		(89.58%)		(87.08%)		(85.42%)

Since the SOHH predicts that the order of difficulty from lowest to highest should run from OS to OO/SS to SO/OOPREP to SOPREP, it can be seen that none of the orders extracted from the data adhered to the order the SOHH posited. The scores of the intermediate group diverged from this order because SOPREP was

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NPAH might have if the average score of XS is higher than the average score of XO, in which case both the NPAH will hold out. That is, such a switch-up can be explained in terms of the PDH without contradicting the NPAH.

not the most difficult RC as postulated. The advanced group found SS the easiest, also contradicting the SOHH.

As for NRRC, the accuracy score orders of the three groups are shown above in (68) and presented here again in (70) for convenience.

(70) Accuracy scores on each NRRC type arranged from highest to lowest

Intermediate group:

SS	>	OS	>	SO	=	SOPREP	>	OO	>	OOPREP
(87.50%)		(85.00%)		(82.50%)		(82.50%)		(81.25%)		(78.75%)

Advanced group:

SS	>	OS	>	SO	>	OO	=	SOPREP	>	OOPREP
(92.50%)		(88.75%)		(87.50%)		(86.25%)		(86.25%)		(83.75%)

At a glance, it can be seen that the SOHH order did not crop up in any of the orders presented here. Because SS was supposed to be the second easiest subtype of RC, the fact that SS categorically assumed the first slot in the order of every group quickly extinguished the chance for the SOHH to apply.

These orders suggested that the SOHH did not apply to this set of data. That is, the results produced by these Thai learners might have been motivated

by some other underlying forces other than discontinuities present in an RC. In a grimmer case, discontinuities proposed by the SOHH might not be an accurate factor in predicting a difficulty order. This will be further discussed in Section 6.4.3.

5.1.4 Scores in relation to types of relativizers

This section looks at the scores of each type of relativizers, namely *wh*-operator, that, and null relativizer. This is in order to further explore whether the effects of the RC-related hypotheses demonstrated above were present across all types of relativizers, to analyze how the accuracy scores between marker types differed, and to compare the accuracy scores of these marker types on RRC and NRRC. It should be noted, however, that the only relativizer with NRRC data was *wh*-operator as the two other markers, when used in NRRC, create ungrammaticality.

5.1.4.1 Wh-operator

For RRC, the scores of the two learner groups on each RC subtype featuring *wh*-operators are shown below in Table 21.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	87.50%	90.00%	86.25%	86.25%	81.25%	81.25%	85.42%
Advanced	95.00% (+7.50%)	92.50% (+2.50%)	90.00% (+3.75%)	91.25% (+5.00%	85.00% (+3.75)	87.50% (+6.25%)	90.21% (+4.79%)

Table 21: Accuracy scores on each RRC subtype with a *wh*-operator in the sentence interpretation task

For the intermediate group, the average score stood at 85.42%. The subtype with the highest accuracy score was OS (90.00%). The scores tapered to 87.50% with SS, 86.25% with SO and OO, and finally to 81.25% with SOPREP and OOPREP.

The advanced group showed a higher average score of 90.21%. The subtype with the highest accuracy score was SS (95.00%). The order then went from OS (92.50%) and OO (91.25%) to SS (90.00%), OOPREP (87.50%) and SOPREP (85.00%), respectively.

Again, a proficiency-related progression was evident as the between-group score differences shown in parentheses were all in the plus.

The scores arranged from high to low as described above are presented schematically in (72) below.

(72) Accuracy scores on each RRC type with *wh*-operators arranged from highest to lowest

Intermediate group:

OS	>	SS	>	SO	=	OO	>	SOPREP	=	OOPREP	
(90.00%)		(87.50%)		(86.25%)		(86.25%)		(81.25%)		(81.25%)	

Advanced group:

SS	>	OS	>	OO	>	SO	>	OOPREP	>	SOPREP	
(95.00%)		(92.50%)		(91.25%)		(90.00%)		(87.50%)		(85.00%)	

To explore the effects of the three RC-related hypotheses, the scores were analyzed based on the grammatical role of the relativized material (NPAH) and the grammatical role of the RC head noun (PDH) as well as the accuracy score orders (SOHH).

The scores of RRC with *wh*-operators categorized by the grammatical role of the relativized material are shown in Table 22 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	88.75%	86.25%	81.25%
Advanced	93.75%	90.63%	86.25%

Table 22: Average accuracy scores on each RRC type with *wh*-operators based on the grammatical role of the relativized material in the sentence interpretation task

It can be seen that in both learner groups, the highest scores fell on XS, followed by XO, and XOPREP, respectively, as predicted by the NPAH.

As for the effect of the PDH, the scores of RRC with *wh*-operators categorized by the grammatical role of the RC head noun are shown in Table 23 below.

Groups/RC types	SX	OX
Intermediate	85.00%	85.83%
Advanced	90.00%	90.42%

Table 23: Average accuracy scores on each RRC type with *wh*-operators based on the grammatical role of the head noun in the sentence interpretation task

The effect of the PDH could be seen in the two learner groups, with OX having slightly higher scores than SX (0.83% for the intermediate group and 0.42% for the advanced group).

In terms of the effect of the SOHH, none of the orders shown above in (72) followed the order proposed by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP), implying that the orders were not governed by the SOHH.

As for NRRC, because Task 1 only tested grammatical items and NRRCs are only grammatical with *wh*-operators, the overall scores on NRRC and the scores on NRRC with *wh*-operators were one and the same as there were no test items of NRRC with other relativizers. As such, the data on NRRC will not be described again; only conclusions will be repeated here.

For the overall scores on NRRC (see Table 13 under Section 5.1.2), a proficiency-related progression could be seen in both the average scores and across all RC subtypes. In terms of the effects of the three RC-related hypotheses, only the NPAH seemed to exert a clear influence (see Table 16 under Section 5.1.3.1). The reverse of the PDH was observed, with SX having higher scores than OX, unlike what was found in RRCs (see Table 19 under Section 5.1.3.2), while the SOHH was not confirmed by the results (see (70) under Section 5.1.3.3).

To explore whether the trend in which RRCs were perceived to be easier than NRRCs appeared in RCs with *wh*-operators, the average score differences between RRC and NRRC are shown below in Table 24.

Groups/RC types	RRCs	NRRCs
Intermediate	85.42%	82.92%
Advanced	90.21%	87.50%

Table 24: Average accuracy scores on RRCs and NRRCs with *wh*-operators of the learner groups in the sentence interpretation task

It can be seen that even with *that* and null relativizers excluded, the trend was still clear in both learner groups. That is, RRCs had higher accuracy scores than NRRCs. For a visual presentation, the scores are also shown in Figure 5.

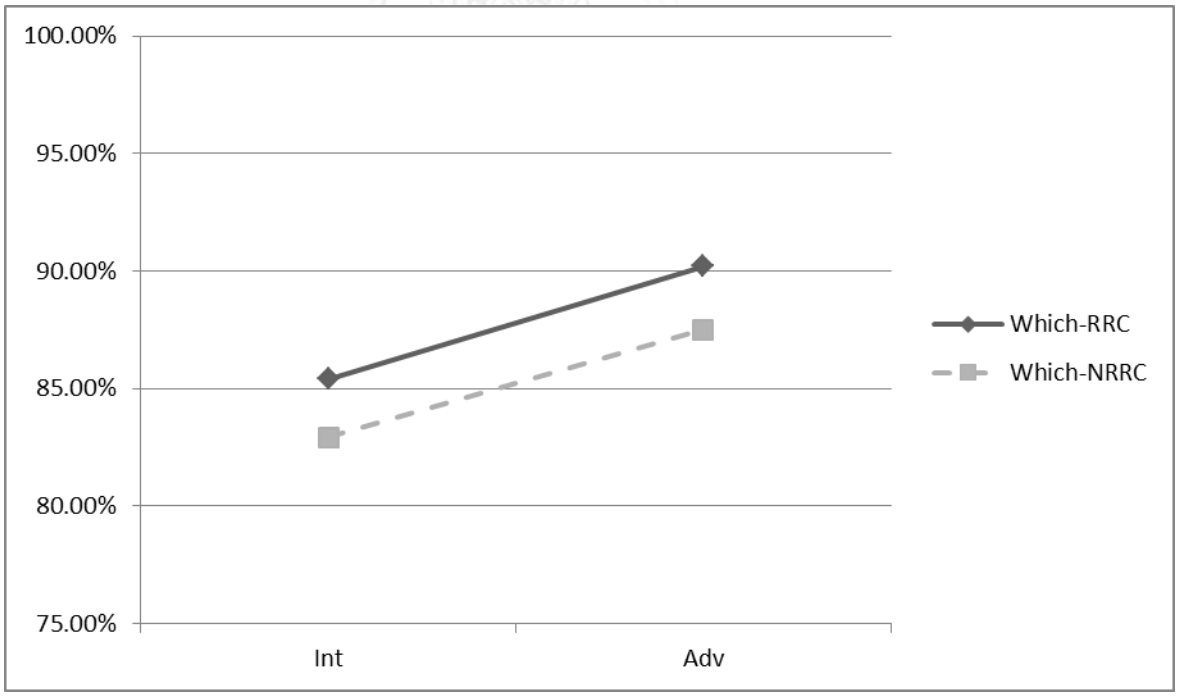

Figure 5: Progression of scores on RRCs and NRRCs with *wh*-operators of the learner groups in the sentence interpretation task

In conclusion, for RCs with *wh*-operators, it appeared that a proficiency-related progression was still evident in both groups. In addition, the learner groups found RRCs to be easier than NRRCs. As for the effects of the three RC-related hypotheses, the NPAH applied to both RRCs and NRRCs, while the SOHH was not supported by the data of both RC types. What was interesting lay in the fact that the effect of PDH could be seen in RRCs, albeit slightly, but not in NRRCs. This last phenomenon will be discussed further in Section 6.4.2.

5.1.4.2 That

Because *that* is only used in RRCs, only the data on RRCs will be presented in this subsection. The scores of each subtype of RRCs featuring *that* are shown in Table 25 below.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	91.25%	93.75%	86.25%	90.00%	82.50%	81.25%	87.50%
Advanced	95.00% (+3.75%)	95.00% (+1.25%)	91.25% (+5.00%)	93.75% (+3.75%)	88.75% (+6.25%)	88.75% (+7.50%)	92.08% (+4.58%)

Table 25: Accuracy scores on each RRC type with *that* in the sentence interpretation task

For the intermediate group, the average score stood at 87.50%. The subtype with the highest accuracy score was OS (93.75%). The scores were then ordered from SS (91.25%), OO (90.00), SO (86.25%) to SOPREP (82.50%) and OOPREP (81.25%).

The advanced group exhibited a higher average score than the previous group (92.08%). The highest accuracy scores (95.00%) belonged to SS and OS. OO (93.75%) came in next, followed by SO (91.25%), SOPREP and OOPREP (88.75%).

It should also be noted that the numbers in parentheses showing between-group score differences were all in the plus, suggesting that there was a proficiency-related progression.

The scores described above can be arranged on a high-to-low basis schematically as shown below in (73).

(73) Accuracy scores on each RRC type with *that* arranged from highest to lowest

Intermediate group:

OS	>	SS	>	OO	>	SO	>	SOPREP	>	OOPREP
(93.75%)		(91.25%)		(90.00%)		(86.25%)		(82.50%)		(81.25%)

Advanced group:

SS	=	OS	>	OO	>	SO	>	SOPREP	=	OOPREP
(95.00%)		(95.00%)		(93.75%)		(91.25%)		(88.75%)		(88.75%)

As for the effects of the three RC-related hypotheses, the scores were first categorized on the basis of the grammatical role of the relativized material to fathom the influence of the NPAH, as shown below in Table 26.

Groups/RC types	XS	XO	XOPREP
Intermediate	92.50%	88.13%	81.88%
Advanced	95.00%	92.50%	88.75%

Table 26: Average accuracy scores on each RRC type with *that* based on the grammatical role of the relativized material in the sentence interpretation task

Similar to the results on *wh*-operators, the data showed that XS had the highest scores across both subject groups, followed by XO and XOPREP respectively, in keeping with the prediction of the NPAH.

As for the effects of the PDH, the scores sorted by the grammatical role of the RC head are presented below in Table 27.

Groups/RC types	SX	OX
Intermediate	86.67%	88.33%
Advanced	91.67%	92.50%

Table 27: Average accuracy scores on each RRC type with *that* based on the grammatical role of the head noun in the sentence interpretation task

It can be seen that, as postulated by the PDH, OX had higher scores than SX across in both groups. It should also be noted that the effect was more pronounced in the intermediate group, with the difference of 1.66%. When compared with *wh*-operators (see Table 22 under 5.1.4.1), it can be seen that the differences between OX and SX in both learner groups were more pronounced in RRCs with *that*.

Lastly, to observe the effect of the SOHH, the order posited by the hypothesis (OS > OO/SS > SO/OOPREP > SOPREP) was compared to those yielded by the data, as shown in (73) above. Similar to the findings with *wh*-operators earlier in 5.1.4.1, the orders did not lend support to the SOHH; none of the sequences followed the SOHH order.

5.1.4.3 Null relativizer

Again, NRRCs were excluded in this category as they do not allow null relativizers. Along the same vein, because XS does not allow null relativizers, RRC items in Task 1 testing null relativizers included only SO, OO, SOPREP, and OOPREP. The scores for these individual subtypes are shown below in Table 28.

Groups/RC types	SO	OO	SOPREP	OOPREP	Average
Intermediate	85.00%	85.00%	77.50%	75.00%	80.63%
Advanced	87.50% (+2.50%)	87.50% (+2.50%)	82.50% (+5.00%)	85.00% (+10.00%)	85.63% (+5.00%)

Table 28: Accuracy scores on each RRC subtype with a null relativizer in the sentence interpretation task

For the intermediate group, the average score was (80.63%). SO and OO had equal scores (85.00%) and assumed the top spot in the score ordering. The second highest score belonged to SOPREP (77.50%), followed by OOPREP (75.00%).

The advanced group showed the average score of 85.63%. Similar to the previous group, SO and OO tied at 87.50% in the top spot, followed by OOPREP (85.00%) and SOPREP (82.50%), respectively.

Again, a proficiency-related progression was observed, with the numbers in parentheses showing between-group score differences all in the plus.

The scores of these subtypes by both groups arranged from highest to lowest are presented schematically in (74) below.

(74) Accuracy scores on each RRC type with a null relativizer arranged from highest to lowest

Intermediate group:

SO	=	OO	>	SOPREP	>	OOPREP
(85.00%)		(85.00%)		(77.50%)		(75.00%)

Advanced group:

SO	=	OO	>	OOPREP	>	SOPREP
(87.50%)		(87.50%)		(85.00%)		(82.50%)

The scores were also sorted by the grammatical role of the relativized material to investigate into the effect of the NPAH, as shown below in Table 29. It should be noted that XS is not present because XS items with null relativizers are ungrammatical and were thus not featured in Task 1.

Groups/RC types	XO	XOPREP
Intermediate	85.00%	76.25%
Advanced	87.50%	83.75%

Table 29: Average accuracy scores on each RRC type with null relativizers based on the grammatical role of the relativized material in the sentence interpretation task

In both learner groups, the results were consistent with previous findings. That is, XO had higher scores than XOPREP, as postulated by the NPAH.

To look into the influence of the PDH, the scores were also categorized by the grammatical role of the RC head, as shown in Table 30 below.

Groups/RC types	SX	OX
Intermediate	81.25%	80.00%
Advanced	85.00%	86.25%

Table 30: Average accuracy scores on each RRC type with null relativizers based on the grammatical role of the head noun in the sentence interpretation task

While the results of the advanced group appeared to be in keeping with the overall trend for RRC in which OX was perceived to be slightly easier than SX (i.e. 1.25%), this tendency was broken in the intermediate group. For the intermediate group, SX was found to be slightly easier than OX (i.e. 1.25%), opposing

the prediction made by the PDH. However, this idiosyncrasy did not change the overall trend of RRCs as shown in Table 18 under 5.1.3.2.

With the three relativizers covered in detail, Figure 6 below illustrates the differences in the average scores of each relativizer in each subject group.

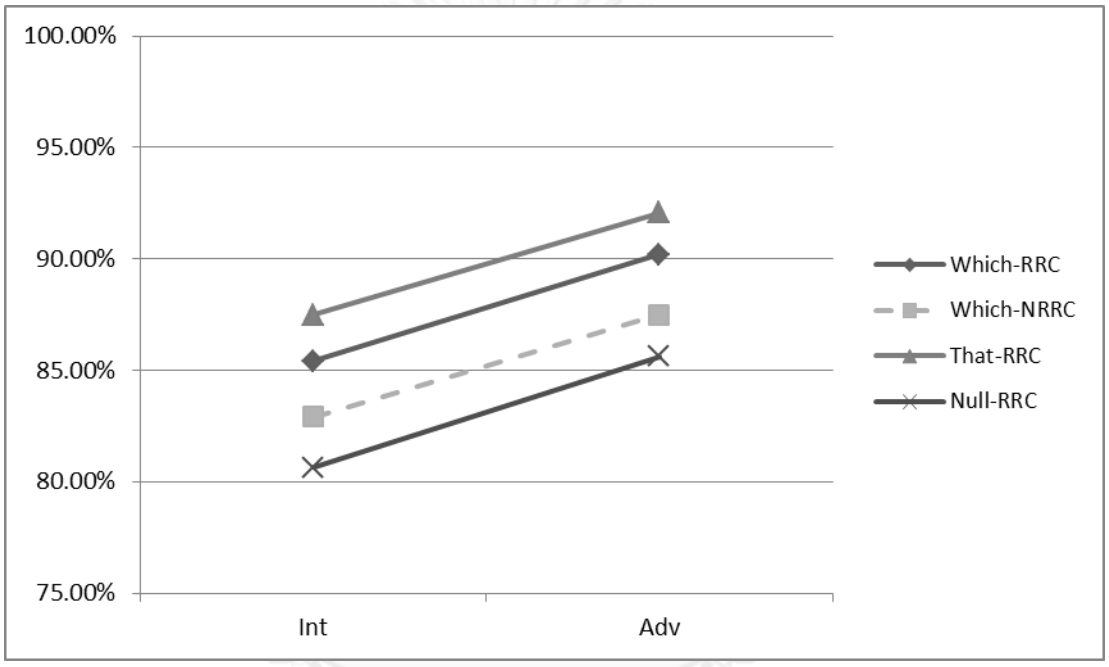

Figure 6: Progression of scores on RRCs and NRRCs based on relativizers of the learner groups in the sentence interpretation task

It can be seen that *that* had the highest scores consistently with *wh*-operators (both in RRCs and NRRCs) trailing after while null relativizers had the lowest scores across all subject groups. The fact that *that* appeared to be easier than *wh*-operators and null relativizers, respectively, will be further discussed in Section 6.5.

5.2 Task 2: Grammaticality judgment task

Similar to the previous section, this section will start off with the overall scores of RRCs and NRRCs in Task 2. Then, the accuracy scores will be presented in detail and arranged into orders from highest to lowest to observe the degrees of relative difficulty each RC presents in each subject group. Then, the scores will be analyzed in relation to the three RC-related hypotheses to analyze the extent to which they are supported or contradicted by the data. Finally, the data will be analyzed on the basis of the relativizers involved, pronoun retention, and doubly-filled CPs, in order to get a more refined picture of the overall trends found in previous subsections. Written data will only be mentioned if it is relevant to the discussion. It should also be noted that in order to keep the focus on the learners' data, the scores of the control group will be presented only in the overall score section.

5.2.1 Overall scores

The overall scores of items on RRCs and RRCs sorted by subject groups are presented in Table 31 below.

Groups/RC types	RRCs	NRRCs
Intermediate	79.72%	73.08%
Advanced	91.25% (+11.53%)	87.33% (+14.25%)
Control	96.89% (+5.64%)	95.89% (+8.66%)

Table 31: Average accuracy scores on judgment of RRCs and NRRCs of the three groups in the grammaticality judgment task

For RRCs, the average accuracy score of the intermediate group stood at 79.72%, which was 11.25% lower than that of the advanced group, which was 91.25%. The control group scored the highest among the three groups at 96.89%, which was 5.64% higher than the average score of the advanced group.

As for items testing NRRCs, the lowest average accuracy score also belonged to the intermediate group (73.08%). The advanced group came in second at 87.33% (14.25% higher than the score of the intermediate group), and the control group ranked the highest at 95.89% (8.66% higher than the score of the advanced group).

For both RRCs and NRRCs, there seemed to be a strong proficiency-related trend similar to what was found in Task 1, with the intermediate group scoring the lowest, the advanced group coming in second, and the control group scoring the

highest. This trend suggested that L1 Thai learners could acquire English RCs. This will be further elaborated in Section 6.1.

When a comparison between RRCs and NRRCs was made, it was evident that every group exhibited lower average scores on NRRCs, as illustrated in Figure 7 below, in which the line representing NRRC constantly remained under the line representing RRC across the three subject groups.

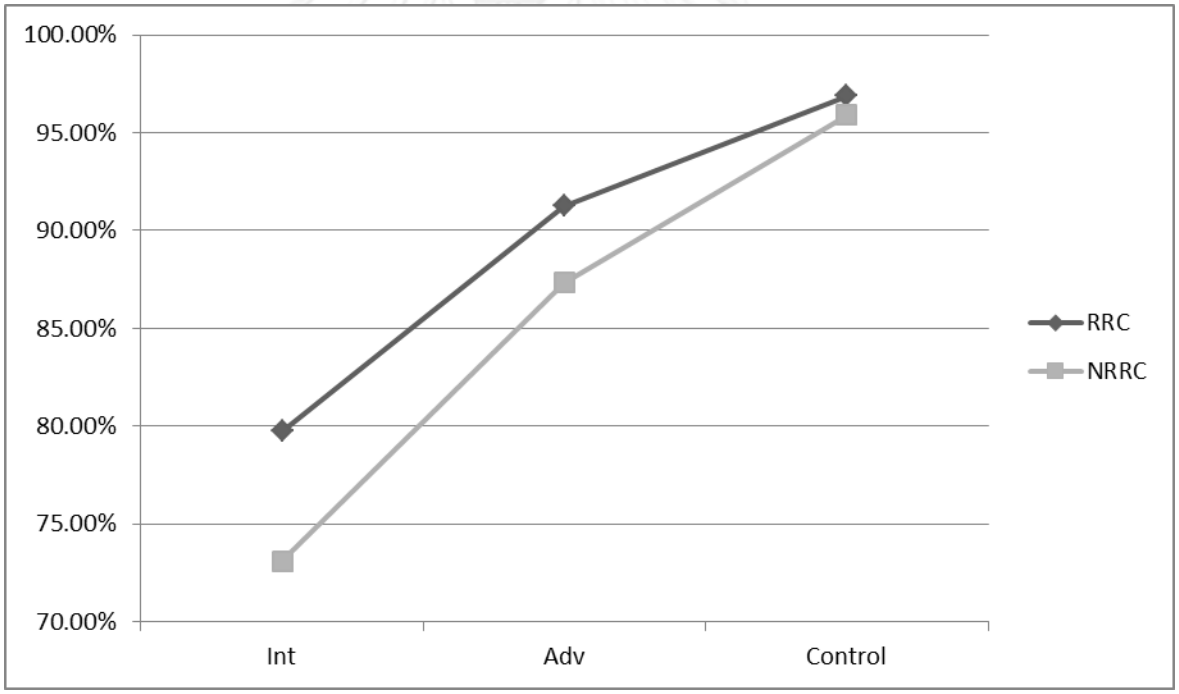

Figure 7: Progression of scores on RRCs and NRRCs in the subject groups in the grammaticality judgment task

5.2.2 Detailed scores and orders of difficulty

To get a more refined picture of the data presented above, the scores were broken down by RC subtypes and arranged into accuracy orders. The scores on RRC subtypes by the learner groups are presented in Table 32 below.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	83.67%	83.33%	77.83%	81.67%	75.83%	76.00%	79.72%
Advanced	93.50% (+9.83%)	92.17% (+8.83%)	91.00% (+13.17%)	92.67% (+11.00%)	88.83% (+13.00%)	89.33% (+13.33%)	91.25% (11.53%)

Table 32: Accuracy scores on judgment of each RRC type of the learner groups in the grammaticality judgment task

For the intermediate group, the highest score belonged to SS (83.67%), only slightly higher than the second highest subtype OS (83.33%). OO (81.67%) came next in the order, followed by SO (77.83%), OOPREP (76.00%), and SOPREP (75.83%), respectively.

As for the advanced group, the easiest subtype was SS (93.50%), with OO (92.67%) and OS (92.17%) trailing after very closely. SO (91.00%) came in fourth, followed by OOPREP (89.33%) and SOPREP (88.83%)

When each subtype was compared, it can be seen that there was a clear proficiency-related progression. That is, the accuracy scores increased with proficiency, suggesting that, like in Task 1, RRCs can be acquired.

The accuracy score orders of both subject groups described here are presented schematically from highest to lowest in (75) below.

(75) Accuracy scores on judgment of each RRC type arranged from highest to lowest

Intermediate group:

SS	>	OS	>	OO	>	SO	>	OOPREP	>	SOPREP
(83.67%)		(83.33%)		(81.67%)		(77.83%)		(76.00%)		(75.83%)

Advanced group:

SS	>	OO	>	OS	>	SO	>	OOPREP	>	SOPREP
(93.50%)		(92.67%)		(92.17%)		(91.00%)		(89.33%)		(88.83%)

Similar to the results of the first task, it can be seen that the orders featured different sequences. However, this did not mean that there were no underlying patterns. First of all, the last two slots of both orders were assumed by OPREP and SOPREP respectively, suggesting that they were the most difficult types of RCs among these six. Second, the RC subtype that both intermediate and advanced learners

perceived to be the easiest was unanimously SS. Despite these patterns, these orders did not seem to lend support to any of the three RC-related hypotheses as of now. Therefore, a further in-depth analysis of the data will be carried out in the next sections below.

As for NRRCs, the scores of each subtype by the learner groups are shown below in Table 33.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	76.67%	74.00%	75.17%	73.33%	70.50%	68.83%	73.08%
Advanced	90.67% (+14.00%)	87.50% (+13.50%)	89.00% (+13.83%)	86.83% (+13.50%)	86.17% (+15.67%)	83.83% (+15.00%)	87.33% (+14.25%)

Table 33: Accuracy scores on judgment of each NRRC type of the learner groups

For the intermediate group, the subtype with the highest score was SS (76.67%). SO (75.17%) occupied the second highest score slot, followed by OS (74.00%), OO (73.33%), SOPREP (70.50%), and OOPREP (68.83%), respectively.

The advanced group exhibited an identical sequence, with SS trumping the other subtypes at 90.67%, followed by SO (89.00%), OS (87.50%), OO (86.83%), SOPREP (86.17%), and lastly OOPREP (83.83%).

When the scores of the same subtype were compared, it can be seen that the higher the proficiency level was, the higher the score, lending itself as evidence of a proficiency-related progression.

The scores of each group described above are arranged from highest to lowest in the charts in (76) below.

(76) Accuracy scores on judgment of each NRRC type arranged from highest to lowest

Intermediate group:

SS	>	SO	>	OS	>	OO	>	SOPREP	>	OOPREP
(76.67%)		(75.17%)		(74.00%)		(73.33%)		(70.50%)		(68.83%)

Advanced group:

SS	>	SO	>	OS	>	OO	>	SOPREP	>	OOPREP
(90.67%)		(89.00%)		(87.50%)		(86.83%)		(86.17%)		(83.33%)

Unlike the data on RRCs presented above, the orders of the two learner groups were actually identical in terms of subtype sequences and featured a few underlying patterns. First, the two lowest spots were occupied by XOPREP, similar to the results on RRCs. Second, the top two spots were taken by SX (this X not

including OPREP). Third, the third and fourth slots were occupied by OX (this X not including OPREP). Again, in order to really understand these orders and how they reflected the effects of any of the three RC-related hypotheses, the data will be further analyzed in the next sections.

With the scores of each subtype of RRC and NRRC already covered, a comparison between them could be made. Table 34 below shows the score differences between RRC and NRRC sorted by RC subtypes. Percentages indicated with a minus sign refer to differences between the RRC and NRRC in which the NRRC scores are higher.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	7.00%	9.33%	2.67%	8.33%	5.33%	7.17%	6.64%
Advanced	2.83%	4.67%	2.00%	5.83%	2.67%	5.50%	3.92%

Table 34: Accuracy score differences between RRC and NRRC divided by subtypes in the grammaticality judgment task

It can be seen that for the same subtype, the scores on RRCs were higher than those on NRRCs as the percentages were all in the plus. It can be inferred from that NRRCs were perceived to be more difficult than RRCs across all the subtypes. In

addition, it should be noted that the differences between the average RRC and NRRC scores diminished as the proficiency level increases (see the last column), suggesting that although their acquisition of NRRCs might always lag behind that of RRCs, they could judge NRRCs with accuracy closer to that with which they judged RRCs as they progressed along the acquisition trajectory.

For a better illustration of the data presented in this section, Figure 8 below plots the scores of each RRC and NRRC subtype of each subject group.

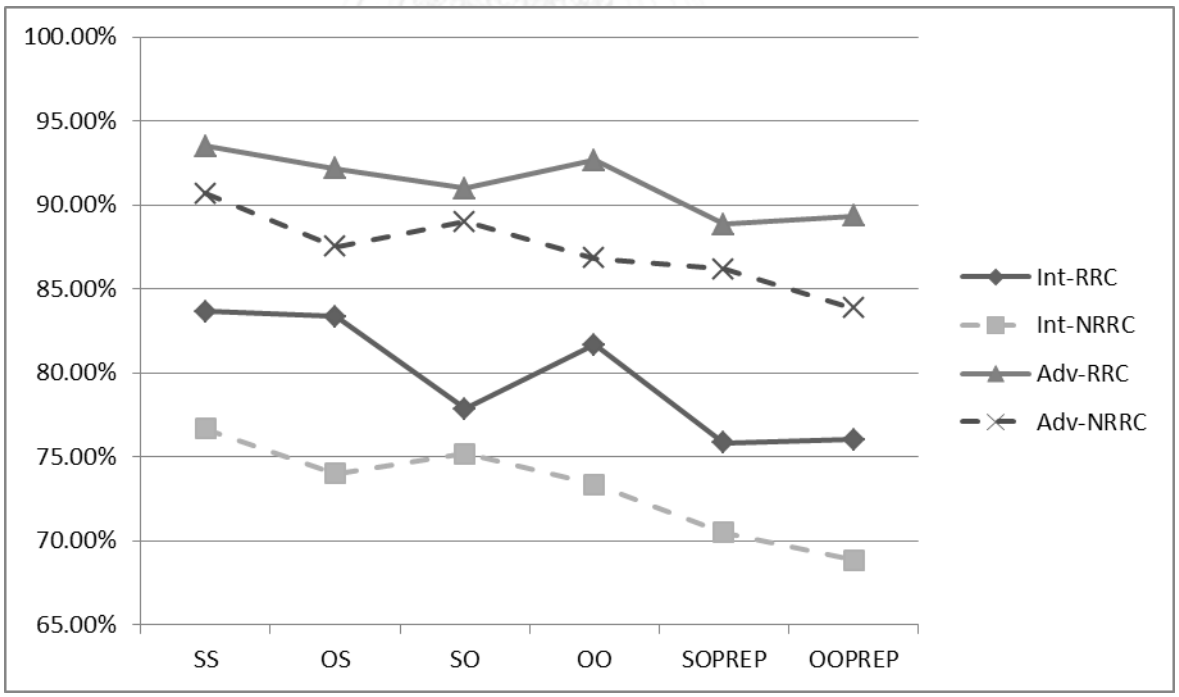

Figure 8: Accuracy scores on judgment of each RRC and NRRC subtype in the grammaticality judgment task

It can be seen that for each subject group, the unbroken line, representing RRCs, was above the dotted line, representing NRRCs. In addition, SS had the highest score for every line, showing that SS was perceived to be the easiest by the subjects.

5.2.3 Scores in relation to the three RC-related hypotheses

Since the scores presented in the previous section did not show the extent to which the influence of the three RC-related hypotheses was present in the data, this section will present the scores sorted on the basis of the grammatical role of the relativized material to gauge the influence of the NPAH as well as the grammatical role of the RC head noun to plumb the influence of the PDH. As for the effect of the SOHH, the orders of difficulty presented in the previous section will be used.

5.2.3.1 NPAH

The scores were categorized on the basis of the grammatical function of the relativized material in order to look into the influence of the NPAH in the data. Table 35 below shows the scores on RRCs by both learner groups.

Groups/RC types	XS	XO	XOPREP
Intermediate	83.50%	79.75%	75.92%
Advanced	92.83% (+9.33)	91.83% (+12.08%)	89.08% (+13.17%)

Table 35: Average accuracy scores on judgment of each RRC type based on the relativized material in the grammaticality judgment task

For the intermediate group, XS (83.50%) appeared to be the easiest type, followed by XO (79.75%) and XOPREP (75.92%), respectively.

Similarly, the type with the highest accuracy score for the advanced group was XS (92.83%), followed XO (91.83%), and XOPREP (89.08%).

From the RRC data, the results seemed to indicate the presence of the influence of the NPAH. That is, because the accessibility hierarchy posited by the NPAH held a degree of validity, the subjects found XS to be easier than XO and XOPREP, respectively.

As for NRRCs, the scores sorted by the grammatical role of the relativized material of the learner groups are presented in Table 36 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	75.33%	74.25%	69.67%
Advanced	89.08% (+13.75%)	87.92% (+13.67%)	85.00% (+15.33%)

Table 36: Average accuracy scores on judgment of each NRRC type based on the relativized material in the grammaticality judgment task

For the intermediate group, XS had the highest accuracy score of 75.33%. XO occupied the second highest score slot with 74.25%, followed by XOPREP (69.97%).

XS ranked highest at 89.08% for the advanced group, followed by XO (87.92%) and XOPREP (85.00%).

The data suggested that even for NRRCs, the NPAH applied to both groups. Therefore, from both RRC and NRRC data, it could be inferred that the NPAH exerted significant influence on the results, similar to the findings in Task 1.

To observe the differences between the RRC and NRRC data, the scores on the grammatical role of the relativized material are presented in Figure 9 below.

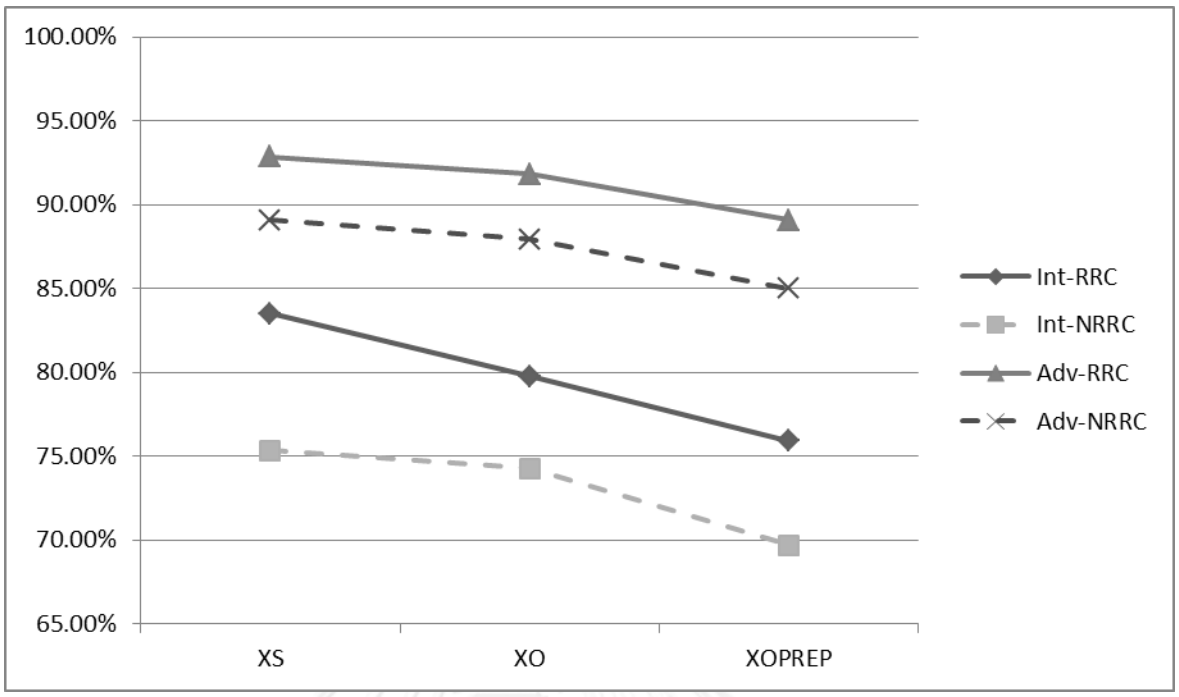

Figure 9: Progression of each RRC and NRRC type based on the grammatical role of the relativized material in the grammaticality judgment task

It can be seen that for both groups, apart from the fact that the scores followed the prediction of the NPAH as mentioned above, the gap between the RRC and the NRRC also diminished as the proficiency increased. In addition, it can be seen that subjects perceived RRCs to be easier than NRRCs even when the data was arranged on the basis of the grammatical role of the relativized material, supporting the findings in 5.2.1 and mirroring the findings in Task 1.

5.2.3.2 PDH

To delve into the influence of the PDH in the data, the scores were also sorted on the basis of the grammatical role of the RC head. The scores on items testing RRCs of both learner groups are presented in Table 37 below.

Groups/RC types	SX	OX
Intermediate	79.11%	80.33%
Advanced	91.11% (+12.00%)	91.39% (+11.06%)

Table 37: Average accuracy scores on judgment of each RRC type based on the grammatical role of the head noun in the grammaticality judgment task

In both learner groups, the OX scores were higher than their SX counterparts. For the intermediate learners, the OX score was 80.33% while the SX score stood at 79.11%, (1.22% lower). As for the advanced group, the OX score was 91.39%, only 0.28% higher than the SX score (91.11%).

The results suggested the presence of the influence of the PDH in the RRC data of both learner groups, albeit very small. That is, the grammaticality of an

RRC could be judged more easily if it modified an object rather than a subject of the matrix clause.

In addition, the between-group score differences were also all in the plus, again indicating that a proficiency-related progression shown previously was evident even when the scores were arranged the grammatical role of the RC head.

As for NRRCs, the scores categorized by the grammatical role of the RC head are presented below in Table 38.

Groups/RC types	SX	OX
Intermediate	74.11%	72.06%
Advanced	88.61% (+14.50%)	86.06% (+14.00%)

Table 38: Average accuracy scores on judgment of each NRRC type based on the grammatical role of the head noun in the grammaticality judgment task

Interestingly, for both groups, the SX scores seemed to outstrip the OX scores. For the intermediate group, the SX score stood at 74.11%, 2.05% higher than the OX score (72.06%). For the advanced group, the SX score was 88.61% while the OX score trailed behind at 86.06%. The results indicated that for NRRCs, the PDH

did not seem to have as much influence, if at all, as on RRCs. This phenomenon mirrored what was found in Task 1 and will be discussed further in Section 6.4.2.

To observe the differences between the RRC and NRRC data, the scores are presented in Figure 10 below.

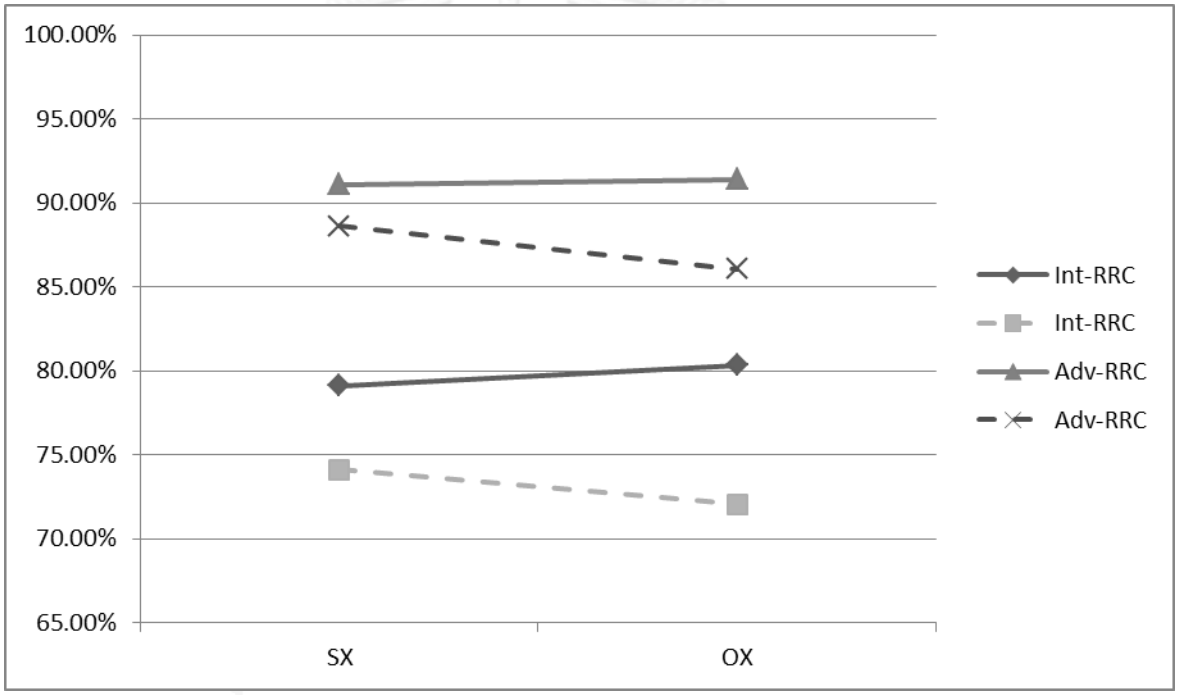

Figure 10: Progression of each RRC and NRRC type based on the grammatical role of the head noun in the grammaticality judgment task

It can be seen that the gap between RRCs and NRRCs seemed to diminish as the proficiency level increased. This suggested that although NRRCs might be considerably more difficult than RRCs for learners at lower proficiency levels, the

construction came increasingly closer to RRCs in terms of difficulty/ease as learners became more advanced.

5.2.3.3 SOHH

As mentioned in 5.1.3.3, the data in which the presence of the influence of the SOHH can be gauged has to be in the form of orders of difficulty, rather than average scores classified by grammatical roles. Therefore, for RRCs, the orders of accuracy scores found in Task 2 (presented earlier in (75) under 5.2.1) are reproduced here for convenience in (77) below.

(77) Accuracy scores on judgment of each RRC type arranged from highest to lowest

Intermediate group:

SS	>	OS	>	OO	>	SO	>	OOPREP	>	SOPREP
(83.67%)		(83.33%)		(81.67%)		(77.83%)		(76.00%)		(75.83%)

Advanced group:

SS	>	OO	>	OS	>	SO	>	OOPREP	>	SOPREP
(93.50%)		(92.67%)		(92.17%)		(91.00%)		(89.33%)		(88.83%)

It can be seen that none of the orders adhered to the discontinuity-motivated difficulty order predicted by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP). Although the subtype with the least accuracy scores was SOPREP in both groups as posited by the SOHH, what outright contradicted this hypothesis was the fact that SS appeared to head all of the RRC difficulty orders found in the grammaticality judgment task. The results implied that the SOHH did not hold sway over this set of data.

As for NRRCs, the orders of accuracy scores, presented above in (76) under 5.2.1, are repeated below for convenience in (78).

(78) Accuracy scores on judgment of each NRRC type arranged from highest to lowest

Intermediate group:

SS	>	SO	>	OS	>	OO	>	SOPREP	>	OOPREP
(76.67%)		(75.17%)		(74.00%)		(73.33%)		(70.50%)		(68.83%)

Advanced group:

SS	>	SO	>	OS	>	OO	>	SOPREP	>	OOPREP
(90.67%)		(89.00%)		(87.50%)		(86.83%)		(86.17%)		(83.33%)

It is evident that the order postulated under the SOHH (OS > OO/SS > SO/OOPREP > SOPREP) was not borne out by this set of data. First of all, in both learner groups, OOPREP, posited to have four discontinuities, appeared to be more difficult than SOPREP, a subtype with three discontinuities, which should have been easier. Again, the easiest subtype went to SS, which should have been more difficult that OS under the SOHH. This is not to mention the fact that OO appeared in the fourth slot in the learner groups and the fifth in the control group when it was supposed to be as difficult as SS. Thus, from the data, it cannot be said that the SOHH had much influence, if at all, similar to what was found in 5.1.3.3.

Therefore, in Task 2, the findings did not indicate any presence of the influence of the SOHH, mirroring the conclusion reached in Task 1. Some possible explanations behind this phenomenon will be discussed in Section 6.4.3.

5.2.4 Scores in relation to types of relativizers and RC-related errors

This section takes a close-up look at the RRC and NRRC scores of each type of relativizer (*wh*-operator, *that*, and null relativizer) as well as RC-related errors in English (resumptive pronoun and doubly-filled CP). Under each subsection, first of all, the RRC and NRRC scores were sorted by the type of relevant relativizer and RC-

related error. This was in order to observe how the scores spread out across the six RC subtypes and to come up with the difficulty orders. Once the RRC and NRRC scores had been described and arranged, the two sets of scores were compared in order to see if the proficiency-related progression established earlier was actually found across the data and aggregated at certain relativizers or RC-related errors. Then, the scores were sorted to find out whether the influences of the three RC-related hypotheses still cropped up across the data. After these steps had been carried out, the average scores of the different relativizers and RC-related errors were compared to see the relative problems each relativizer and RC-related error posed to the subjects.

5.2.4.1 Wh-operator

For RRCs, the scores on items testing *wh*-operators of both learner groups sorted by subtypes are presented below in Table 39.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	85.00%	85.83%	79.17%	84.17%	77.50%	76.67%	81.39%
Advanced	95.83% (+10.83%)	93.33% (+7.50%)	92.50% (+13.33%)	93.33% (+9.17%)	89.17% (+11.67%)	90.00% (+13.33%)	92.36% (+10.97%)

Table 39: Accuracy scores on judgment of each RRC type with a *wh*-operator

For the intermediate group, the average score was 81.39%. The subtype with the highest score was OS (85.33%), only 0.33% higher than SS (85.00%) and 1.66% higher than OO (84.16%). The next half of the scores saw a sharp drop, with SO standing at 79.17%, followed by SOPREP (77.50%) and OPREP (76.67%).

The advanced group scored 92.36% overall, with SS leading in the top spot at 95.83%, followed by OS and OO (93.33%), SO (92.50%), OOPREP (90.00%), and SOPREP (89.17%).

Again, a proficiency-related progression was evident as the between-group score differences shown in parentheses were all in the plus.

The scores described above are arranged from high to low and presented schematically in (79) below.

(79) Accuracy scores on judgment of each RRC type with *wh*-operators arranged from highest to lowest

Intermediate group:

OS	>	SS	>	OO	>	SO	>	SOPREP	>	OOPREP
(85.83%)		(85.00%)		(84.17%)		(79.17%)		(77.50%)		(76.67%)

Advanced group:

SS	>	OS	=	OO	>	SO	>	OOPREP	>	SOPREP
(95.83%)		(93.33%)		(93.33%)		(92.50%)		(90.00%)		(89.17%)

To explore the effects of the three RC-related hypotheses, the scores were further analyzed based on the grammatical role of the relativized material (NPAH) and the grammatical role of the RC head noun (PDH) as well as the accuracy score orders (SOHH).

The scores on RRCs with *wh*-operators categorized by the grammatical role of the relativized material are shown in Table 40 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	85.42%	81.67%	77.08%
Advanced	94.58%	92.92%	89.58%

Table 40: Average accuracy scores on judgment of each RRC type with *wh*-operators based on the grammatical role of the relativized material in the grammaticality judgment task

It can be seen that in both learner groups, the highest scores fell on XS, followed by XO, and XOPREP, respectively, as predicted by the NPAH.

As for the effect of the PDH, the scores of RRCs with *wh*-operators were categorized by the grammatical role of the RC head noun, as shown in Table 41 below.

Groups/RC types	SX	OX
Intermediate	80.56%	82.22%
Advanced	92.50%	92.22%

Table 41: Average accuracy scores on judgment of each RRC type with *wh*-operators based on the grammatical role of the head noun in the grammaticality judgment task

Interestingly, the effects of the PDH could only be observed in the intermediate group, with OX (82.22%) outstripping SX (80.56%) by 1.66%. However, the scores of the advanced group did not strictly follow the trend, with OX (92.22%)

trailing behind SX (92.50%). It should be pointed out that the score difference was very slight (0.28%). The phenomenon might point to the fact that the effect of the PDH was more pronounced in learners of lower proficiency. Possibly, with their parsing ability still not fully developed, they might have found SX, which intervened between subjects and the rest of the matrix clause, to be more challenging while learners of more advanced proficiency did not experience the same sort of problem with RCs with *wh*-operators.

In terms of the effect of the SOHH, none of the orders shown above in (79) followed the order proposed by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP), suggesting that the orders were not motivated by discontinuities as posited by the SOHH.

As for NRRCs, the scores of the six subtypes featuring *wh*-operators in Task 2 are presented below in Table 42.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	85.83%	81.67%	84.17%	82.50%	79.17%	75.83%	81.53%
Advanced	94.17% (+8.33%)	91.67% (+10.00%)	93.33% (+9.17%)	89.17% (+6.67%)	88.33% (+9.17%)	87.50% (+11.67%)	90.69% (+9.17%)

Table 42: Accuracy scores on judgment of each NRRC type with a *wh*-operator

For the intermediate group, the average score was 81.53%. The highest accuracy score fell on SS at 85.83%, followed by SO (84.17%), OO (82.50%), OS (81.67%), SOPREP (79.17%), OOPREP (75.83%), respectively.

The advanced group got the average score of 90.69%. The subtype with the highest accuracy score was SS (94.17%), followed by SO (93.33%), OS (91.67%), OO (89.17%), SOPREP (88.33%), and OPREP (87.50%).

It can be seen that the data confirmed the proficiency-related progression established earlier. The results implied that as learners increased in proficiency, they became better at judging the grammaticality of NRRCs with *wh*-operators.

The scores presented above arranged from highest to lowest are shown below in (80).

(80) Accuracy scores on judgment of each NRRC type with *wh*-operators arranged from highest to lowest

Intermediate group:

SS	>	SO	>	OO	>	OS	>	SOPREP	>	OOPREP
(85.83%)		(84.17%)		(82.50%)		(81.83%)		(79.17%)		(75.83%)

Advanced group:

SS	>	SO	>	OS	>	OO	>	SOPREP	>	OOPREP
(94.17%)		(93.33%)		(91.67%)		(89.17%)		(88.33%)		(87.50%)

In order to look into the extent to which the NPAH exerted its influence on the results, the NRRC scores were sorted by the grammatical role of the relativized material, as shown in Table 43 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	83.75%	83.33%	77.50%
Advanced	92.92%	91.25%	87.92%

Table 43: Average accuracy scores on judgment of each NRRC type with *wh*-operators based on the grammatical role of the relativized material in the grammaticality judgment task

In both learner groups, the effect of the NPAH could be observed. That is, XS appeared to the easiest out of the three types (83.75% for the intermediate group and 92.92% for the advanced group), followed by XO (83.33% for the intermediate group and 91.25% for the advanced group) and XOPREP (77.50% for the intermediate group and 87.92% for the advanced group).

As for the effect of the PDH, the scores of NRRC with *wh*-operators categorized by the grammatical role of the RC head noun are shown in Table 44 below.

Groups/RC types	SX	OX
Intermediate	83.06%	80.00%
Advanced	91.94%	89.44%

Table 44: Average accuracy scores on judgment of each NRRC type with *wh*-operators based on the grammatical role of the head noun in the grammaticality judgment task

Mirroring the finding in Task 1, the scores revealed that the SX scores were consistently higher than those of OX in both subject groups for NRRCs. For the intermediate group, the SX score (83.06%) was higher than the OX score (80.00%) by 3.06%. Similarly the advanced group's SX score stood at 91.94%, 2.5% higher than

that of OX (89.44%). This phenomenon, in which the reverse of the PDH was observed, warranted a further discussion (see Section 6.4.2).

As for the SOHH, its influence did not seem to be evident in this set of data as the orders of accuracy scores presented above in (80) did not adhere to the order the SOHH posits (OS > OO/SS > SO/OOPREP > SOPREP). This seemed to suggest that the results were not purely motivated by discontinuities, if at all, as postulated by the SOHH.

To explore whether the trend in which RRCs were perceived to be easier than NRRCs lay in RCs with *wh*-operators, the average score differences between RRC and NRRC were calculated, as shown below in Table 45.

Groups/RC types	RRCs	NRRCs
Intermediate	81.39%	81.53%
Advanced	92.36%	90.69%

Table 45 : Average accuracy scores on judgment of RRCs and NRRCs with *wh*-operators of the three groups in the grammaticality judgment task

It appeared that the scores of the intermediate group bucked the trend slightly, with the average of NRRCs (81.53%) going slightly over that of RRCs

(81.39%) by 0.14%. This might be because RRCs and NRRCs share the same set of restrictions for *wh*-operators. That is, unlike *that*, which cannot appear in NRRCs, or null relativizers, which are not allowed in XS, *wh*-operators can be used in RRCs and NRRCs in the same way. That was probably also why the RRC and NRRC scores in the intermediate group differed only 0.14%.

However, for the advanced group, the results lent support to the findings presented earlier, in which NRRCs (90.69%) were found to be more difficult than RRCs (92.36%). The average score differences are charted in Figure 11 below.

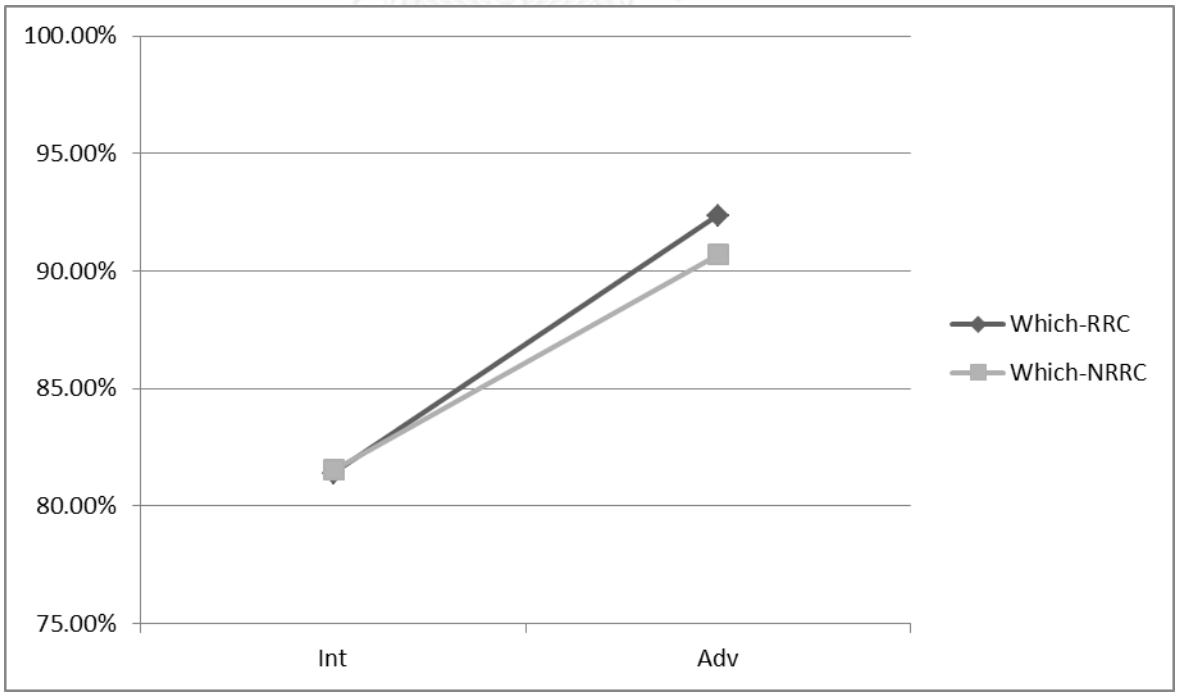

Figure 11: Progression of scores on RRCs and NRRCs with *wh*-operators in the learner groups in the grammaticality judgment task

In conclusion, for RCs with *wh*-operators, it appeared that a proficiency-related progression was generally evident. In addition, the subjects generally found RRCs to be more or less as easy as or slightly easier than NRRCs. As for the effects of the three RC-related hypotheses, the NPAH applied to both RRCs and NRRCs, while the SOHH was not supported by the data of both RC types. However, the effect of the PDH could only be observed most evidently in the RRC data in the intermediate group while the NRRC data, as in Task 1, seemed not to be influenced by the hypothesis, a phenomenon which will be discussed in detail in Section 6.4.2.

5.2.4.2 That

Now that the scores on *wh*-operators have been dealt with, this subsection sets out to detail the scores on Task 2 items testing *that* complementizer. For RRCs, the scores on *that* distributed by subtypes are presented below in Table 46.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	90.83%	90.00%	85.00%	88.33%	84.17%	82.50%	86.81%
Advanced	96.67% (+5.83%)	95.83% (+5.83%)	95.00% (+10.00%)	95.83% (+7.50%)	93.33% (+9.17%)	92.50% (+10.00%)	94.86% (+8.06%)

Table 46: Accuracy scores on judgment of each RRC type with *that* in the grammaticality judgment task

For the intermediate group, the average score was 86.81%. The highest accuracy score belonged to SS at 90.83%, merely 0.83% higher than OS (90.00%). Next in the order were OO (88.33%), SO (85.00%), SOPREP (84.17%), and OOPREP (82.50%), respectively.

The advanced group had the average group of 94.86%. The subtype with the highest accuracy score was SS (96.67%). The second slot was assumed by two contenders, OS and OO (95.83%). Next in the order were SO (95.00%), SOPREP (93.33%), and OOPREP (92.50%), respectively.

It should be noted that the proficiency-related progression continuously demonstrated throughout the results above was also present in this set of data.

The RRC scores of the three groups described above are presented in charts below in (81).

(81) Accuracy scores on judgment of each RRC type with *that* arranged from highest to lowest

Intermediate group:

SS	>	OS	>	OO	>	SO	>	SOPREP	>	OOPREP
(90.83%)		(90.00%)		(88.33%)		(85.00%)		(84.17%)		(82.50%)

Advanced group:

SS	>	OS	=	OO	>	SO	>	SOPREP	>	OOPREP
(96.67%)		(95.83%)		(95.83%)		(95.00%)		(93.33%)		(92.50%)

To explore the influence of the three RC-related hypotheses, the scores were also analyzed based on the grammatical role of the relativized material (NPAH) and the grammatical role of the RC head noun (PDH) as well as the accuracy score orders (SOHH).

The scores on RRCs with *that* categorized by the grammatical role of the relativized material are shown in Table 47 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	90.42%	86.67%	83.33%
Advanced	96.25%	95.42%	92.92%

Table 47: Average accuracy scores on judgment of each RRC type with *that* based on the grammatical role of the relativized material in the grammaticality judgment task

It can be seen that in both learner groups, the highest scores fell on XS (90.42% for the intermediate group and 96.25% for the advanced group), followed by XO (86.67% for the intermediate group and 95.42% for the advanced group), and XOPREP (83.33% for the intermediate group and 92.92% for the advanced group), respectively, as predicted by the NPAH.

As for the effect of the PDH, the scores of RRCs with *that* categorized by the grammatical role of the RC head noun are shown in Table 48 below.

Groups/RC types	SX	OX
Intermediate	86.67%	86.94%
Advanced	95.00%	94.72%

Table 48: Average accuracy scores on judgment of each RRC type with *that* based on the grammatical role of the head noun in the grammaticality judgment task

It can be seen that the effect of the PDH was seen only in the intermediate group, where the OX scores exceeded the SX scores. It should also be noted that the difference between the SX and OX scores in the intermediate group was very slight (0.27%). However, while the SX score of the advanced group might be higher than the OX score, the difference was, again, very slight (0.28%). Therefore, in

both learner groups, it cannot be said with full certainty that the PDH did have any visible effect.

As for the SOHH, the orders of accuracy scores presented above in (81) showed that not only were the orders all differed, they also did not mirror the discontinuity-motivated order posited by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP). It could thus be inferred that this set of data was, again, not governed by the effects of discontinuities.

That in NRRCs, which results in ungrammaticality, was also tested in Task 2. The distribution of the scores on *that* complementizer in Task 2 is presented below in Table 49.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	68.33%	62.50%	66.67%	65.83%	61.67%	59.17%	64.03%
Advanced	88.33% (+20.00%)	82.50% (+20.00%)	85.83% (+19.17%)	84.17% (+18.33%)	82.50% (+20.83%)	79.17% (+20.00%)	83.75% (+19.72%)

Table 49: Accuracy scores on judgment of each NRRC type with *that* in the grammaticality judgment task

For the intermediate group, the average score stood at 64.03%. The subtype with the highest accuracy score was SS (68.33%). Next came SO (66.67%), OO (65.83%), OS (62.50%), SOPREP (61.67%), and OOPREP (59.17%), respectively.

The advanced group had the average score of 83.75%, but had the same difficulty order as the previous group. The highest score belonged to SS (88.33%), followed by SO (85.83%), OO (84.17%), OS and SOPREP (82.50%), and lastly OOPREP (79.17%).

The data generally lent support to the proficiency-related progression evident throughout Task 1 and Task 2.

The detailed score distribution described above is presented schematically below in (82).

(82) Accuracy scores on judgment of each NRRC type with *that* arranged from highest to lowest

Intermediate group:

SS	>	SO	>	OO	>	OS	>	SOPREP	>	OOPREP
(68.33%)		(66.67%)		(65.83%)		(62.50%)		(61.67%)		(59.17%)

Advanced group:

SS	>	SO	>	OO	>	OS	>	SOPREP	>	OOPREP
(88.33%)		(85.83%)		(84.17%)		(82.50%)		(82.50%)		(79.17%)

Next, the NRRC scores were sorted to gauge the influence of the RC-related hypotheses present in them. The scores on *that* in NRRCs arranged on the basis of the grammatical role of the relativized material are shown below in Table 50.

Groups/RC types	XS	XO	XOPREP
Intermediate	65.42%	66.25%	60.42%
Advanced	85.42%	85.00%	80.83%

Table 50: Average accuracy scores on judgment of each NRRC type with *that* based on the grammatical role of the relativized material in the grammaticality judgment task

In both learner groups, although XOPREP had the lowest accuracy score consistently, the gap between XS and XO scores was less than 1 percent (0.83% for the intermediate group and 0.42% for the advanced group, to be exact), making it difficult to conclude that the XS score was significantly higher than the XO score in the intermediate group and that the XO score was significantly higher than the XS score. Therefore, the data suggested that *that* in NRRCs seemed to present problems to more or less the same extent in XS and XO for these learners.

As for the effect of the PDH, the scores on *that* in NRRCs were sorted by the grammatical role of the RC head noun, as presented below in Table 51.

Groups/RC types	SX	OX
Intermediate	65.56%	62.50%
Advanced	85.56%	81.94%

Table 51: Average accuracy scores on judgment of each NRRC type with *that* based on the grammatical role of the head noun in the grammaticality judgment task

The SX scores outstripped the OX scores by 3.06% and 3.62% for the intermediate and advanced groups, respectively. The data seemed to reflect the

trend found throughout NRRCs data in Task 1 and Task 2. That is, in NRRCs, SX seemed to pose less trouble for learners than OX did.

As for the influence of the SOHH, the accuracy score orders presented above in (82) were compared to the difficulty order posited under the hypothesis (OS > OO/SS > SO/OOPREP > SOPREP). No trace of SOHH influence was evident in the score orders, mirroring the findings of Task 1 and the overall results of Task 2. Again, this pointed to the fact that the data might be motivated by factors beyond discontinuities postulated under the SOHH.

To explore whether the trend in which RRCs were perceived to be easier than NRRCs also cropped up in RCs with *that*-operators, the average score differences between RRC and NRRC are shown below in Table 52.

Groups/RC types	RRCs	NRRCs
Intermediate	86.81%	64.03%
Advanced	94.86%	83.75%

Table 52: Average accuracy scores on judgment of RRCs and NRRCs with *wh*-operators of the three groups in the grammaticality judgment task

Consistent with the overall results of both tasks conducted in this study, the results showed that RRCs were easier than NRRCs across all subject groups. It should also be noted that the difference was most pronounced in the intermediate group, with a gap of 22.78%. This gap narrowed as the proficiency increases, diminishing to 11.11% in the advanced group. The phenomenon suggested that learners of low proficiency might have overgeneralized the use of *that* from RRCs to NRRCs, resulting in ungrammaticality (see Section 6.5.2. However, as their proficiency increased, they developed a better handle on the behavior of the complementizer and made fewer errors. The average score differences are also charted in Figure 12 below.

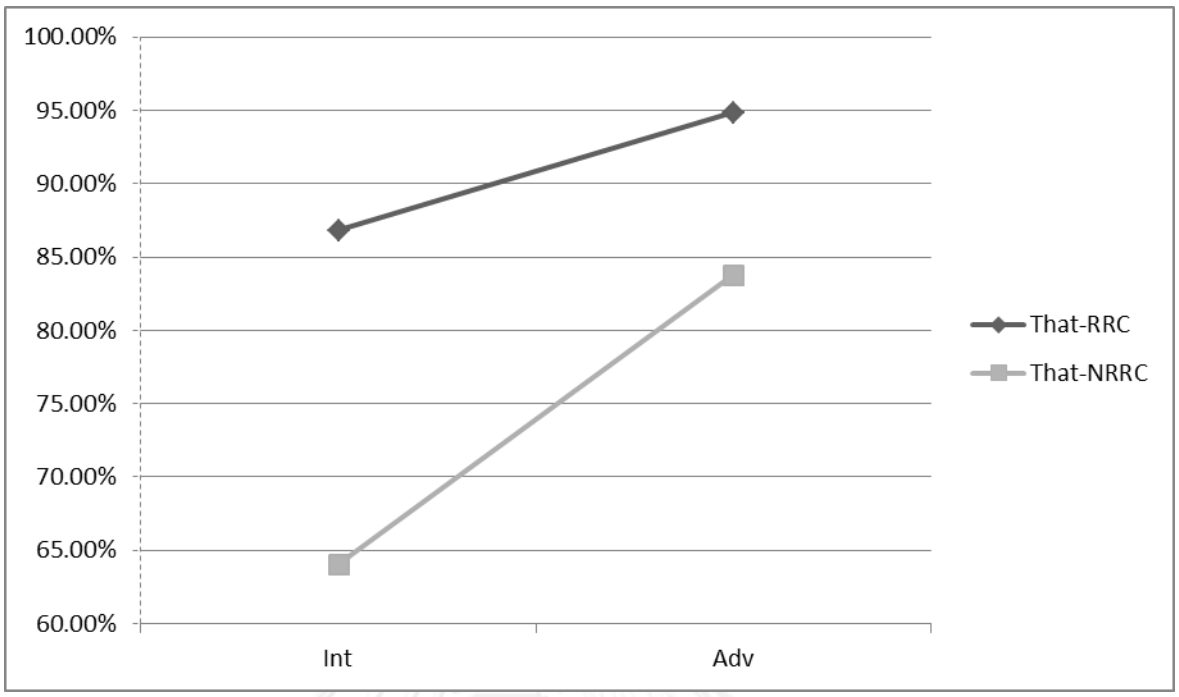

Figure 12: Progression of scores on judgment of RRCs and NRRCs with *that* in the learner groups in the grammaticality judgment task

In conclusion, for RCs with *that*, it appeared that a proficiency-related progression was generally evident. In addition, the subjects generally found RRCs to be easier than NRRCs. As for the effects of the three RC-related hypotheses, the NPAH applied to both RRCs and NRRCs to a certain extent, while the influence of the SOHH did not seem to manifest in the data of both RC types. However, the effect of the PDH appeared to be limited in the RRC data while the NRRC data, as in Task 1, seemed to be motivated by factors that counteracted the influence of the PDH, the details of which will be discussed further in Section 6.4.2.

5.2.4.3 Null relativizer

In this subsection, RRC and NRRC scores on null relativizers will be given an in-depth analysis. Before delving into the data, it should be noted that null relativizers are not allowed in RRC-XS and in all subtypes of NRRCs. Table 53 below details the score distribution of items testing RRCs with null relativizers.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	75.00%	74.17%	69.17%	73.33%	69.17%	71.67%	72.08%
Advanced	88.33% (+13.33%)	87.50% (+13.33%)	86.67% (+17.50%)	88.33% (+15.00%)	85.83% (+16.67%)	85.00% (+13.33%)	86.94% (+14.86%)

Table 53: Accuracy scores on judgment of each RRC type with a null relativizer in the grammaticality judgment task

For the intermediate groups, the average score was 72.08%. The highest accuracy score went to SS (75.00%), followed by OS (74.17%), OO (73.33%), OOPREP (71.67%) and lastly SO and SOPREP (69.17%).

The advanced group had the average score of 86.94%. The SS and OO scores tied at 88.33%, only 0.83% higher than OS (87.50%). Next came SO (86.67%), SOPREP (85.83%), and OOPREP (85.00%), respectively.

From the table, the between-group score differences in parentheses were all indicated by a plus symbol, suggesting that a proficiency-related progression existed in this set of data.

The scores on RRCs with null relativizers described above are presented schematically below in (83).

(83) Accuracy scores on judgment of each RRC type with a null relativizer arranged from highest to lowest

Intermediate group:

SS	>	OS	>	OO	>	OOPREP	>	SO	=	SOPREP	
(75.00%)		(74.17%)		(73.33%)		(71.67%)		(69.17%)		(69.17%)	

Advanced group:

SS	>	OO	>	OS	>	SO	>	SOPREP	>	OOPREP	
(88.33%)		(88.33%)		(87.50%)		(86.67%)		(85.83%)		(85.00%)	

To explore the influence of the three RC-related hypotheses, the scores were also analyzed based on the grammatical role of the relativized material (NPAH) and the grammatical role of the RC head noun (PDH) as well as the accuracy score orders (SOHH).

The scores on RRCs with null relativizers categorized by the grammatical role of the relativized material are shown in Table 54 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	74.58%	71.25%	70.42%
Advanced	87.92%	87.50%	85.42%

Table 54: Average accuracy scores on judgment of each RRC type with null relativizers based on the grammatical role of the relativized material in the grammaticality judgment task

It can be seen that in both learner groups, the highest scores fell on XS (74.58% for the intermediate group and 87.92% for the advanced group), followed by XO (71.25% for the intermediate group and 87.50% for the advanced group), and XOPREP (70.42% for the intermediate group and 85.42% for the advanced group), respectively, as predicted by the NPAH and shown in the overall results. However, it should be noted that the gap between XS and XO scores in the advanced group was very slight (0.42%) in this set of data.

As for the effect of the PDH, the scores of RRCs with null relativizers categorized by the grammatical role of the RC head noun are shown in Table 55 below.

Groups/RC types	SX	OX
Intermediate	71.11%	73.06%
Advanced	86.94%	86.94%

Table 55: Average accuracy scores on judgment of each RRC type with null relativizers based on the grammatical role of the head noun in the grammaticality judgment task

In the intermediate, the OX score (73.06%) was higher than the SX score (71.11%), suggesting that the influence of the PDH was present in this set of data. However, in the advanced group, the SX and OX scores were equal, suggesting that the extent of the effect of the PDH in this set of data might have been limited.

As for the influence of the SOHH, the accuracy score orders presented in (83) were compared to the order posited under this hypothesis (OS > OO/SS > SO/OOPREP > SOPREP). Consistent with the findings in both tasks, the results did not match the SOHH order. Thus, it could be inferred that the data was not motivated by discontinuities as posited by the SOHH.

With the scores on RRCs with null relativizers covered, the NRRC counterpart was also analyzed. Table 56 below shows the scores of Task 2 items testing NRRCs with null relativizers distributed by subtypes.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	67.50%	65.00%	65.83%	62.50%	60.83%	60.83%	63.75%
Advanced	84.17% (+16.67%)	80.83% (+15.58%)	83.33% (+17.50%)	79.17% (+16.67%)	80.83% (+20.00%)	76.67% (+15.83%)	80.83% (+17.08%)

Table 56: Accuracy scores on judgment of each NRRC type with a null relativizer in the grammaticality judgment task

For the intermediate group, the average score was 63.75%. The highest accuracy score belonged to SS (67.50%). Next in the order were SO (65.83%), OS (65.00%), OO (62.50%), and lastly SOPREP and OOPREP (60.83%).

The advanced group had the average score of 80.83%. The difficulty order went from SS (84.17%), SO (83.33%), OS and SOPREP (80.83%) to OO (79.17%) and OOPREP (76.67%).

Overall, the percentages in parentheses indicating between group score differences were all in the plus, confirming the previously established trend that as the proficiency increased, these learners became more accurate in judging NRRCs with null relativizers as incorrect.

The distribution of the scores delineated above is rearranged into high-to-low orders in (84) below.

(84) Accuracy scores on judgment of each NRRC type with a null relativizer arranged from highest to lowest

Intermediate group:

SS	>	SO	>	OS	>	OO	>	SOPREP	=	SOPREP	
(67.50%)		(65.83%)		(65.00%)		(62.50%)		(60.83%)		(60.83%)	

Advanced group:

SS	>	SO	>	OS	=	SOPREP	>	OO	>	OOPREP	
(84.17%)		(83.33%)		(80.83%)		(80.83%)		(79.17%)		(76.67%)	

The scores on NRRCs with null relativizers were then sorted to explore the effect of the three RC-related hypotheses in this set of data. To plumb the extent of the influence of the NPAH present in the data, the scores arranged on the basis of the grammatical role of the relativized material are presented below in Table 57.

Groups/RC types	XS	XO	XOPREP
Intermediate	66.25%	64.17%	60.83%
Advanced	82.50%	81.25%	78.75%

Table 57: Average accuracy scores on judgment of each NRRC type with null relativizers based on the grammatical role of the relativized material in the grammaticality judgment task

In both group, XS scores (66.25% for the intermediate group and 82.50% for the advanced group) were higher than XO scores (64.17% for the intermediate group and 81.25% for the advanced group), which in turn outstripped XOPREP scores (60.83% for the intermediate group and 78.75% for the advanced group), as postulated by the NPAH. Therefore, this set of data was consistent with the overall trend found in Task 1 and Task 2, indicating that the NPAH was a significant influence behind the data.

As for the effect of the PDH, the scores of NRRCs with null relativizers categorized by the grammatical role of the RC head noun are shown in Table 58 below.

Groups/RC types	SX	OX
Intermediate	64.72%	62.78%
Advanced	82.78%	78.89%

Table 58: Average accuracy scores on judgment of each NRRC type with null relativizers based on the grammatical role of the head noun in the grammaticality judgment task

In both learner groups, it can be seen that the SX scores (64.72% for the intermediate group and 82.78% for the advanced group) exceeded the OX scores

(62.78% for the intermediate group and 78.89% for the advanced group), appearing to be in keeping with the trend in the NRRC data in both Tasks 1 and 2.

To look into the effect of the SOHH, a comparison between the accuracy score orders presented above in (84) and the discontinuity-motivated order posited by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP) was made. The results showed that the SOHH was not supported by the data as the orders did not match, consistent with the findings established earlier.

With both RRC and NRRC scores already delineated, a comparison between them can be made. To explore whether the trend in which RRCs were perceived to be easier than NRRCs also was also present in RCs with null relativizers, the average score differences between RRC and NRRC were calculated, as shown below in Table 59.

Groups/RC types	RRCs	NRRCs
Intermediate	72.08%	63.75%
Advanced	86.94%	80.83%

Table 59: Average accuracy scores on judgment of RRCs and NRRCs with null relativizers of the three groups in the grammaticality judgment task

It can be seen that in both learner groups, the RRC scores were higher than the NRRC scores, which was in keeping with the overall trend found in both tasks. The overall scores of RCs with null relativizers are also shown in Figure 13 below.

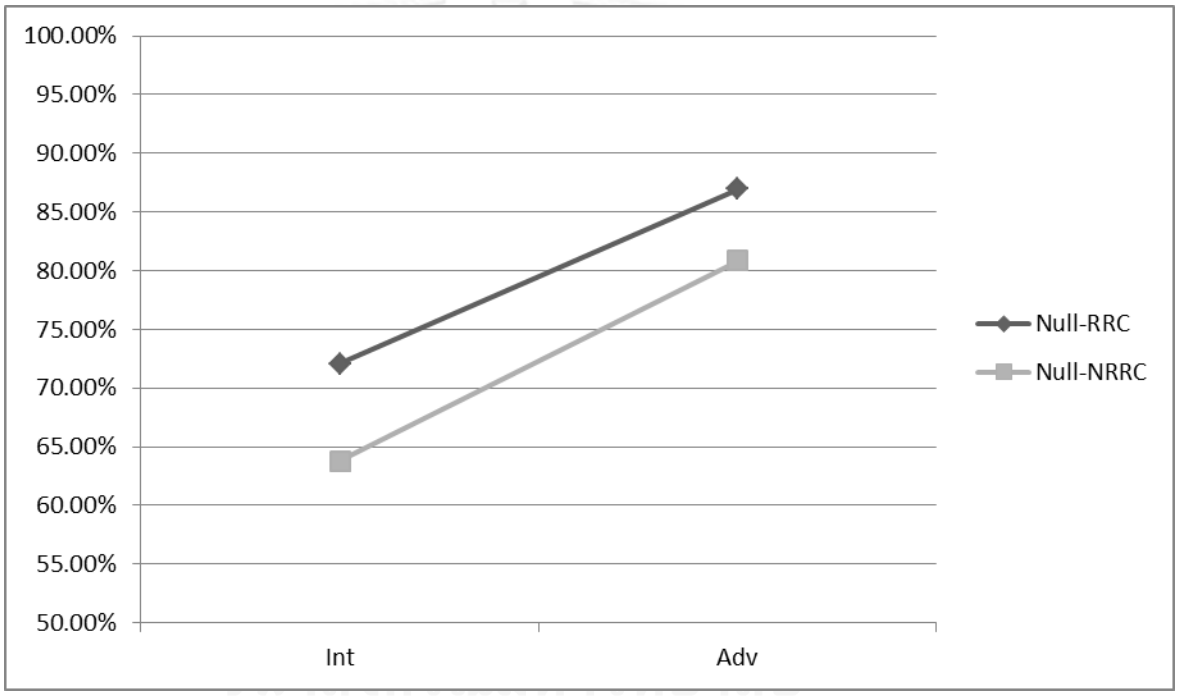

Figure 13: Progression of scores on RRCs and NRRCs with null relativizers in the learner groups in the grammaticality judgment task

In conclusion, for RCs with null relativizers, a proficiency-related progression was generally evident. In addition, the learner subjects generally found RRCs to be easier than NRRCs. As for the effects of the three RC-related hypotheses,

the NPAH applied to both RRCs and NRRCs to a considerable extent, while the influence of the SOHH did not seem to manifest in either RRC or NRRC data. However, the effect of the PDH, while existent, appeared to be limited in RRCs, while the NRRC data, as in Task 1, seemed to be motivated by factors that counteracted the influence of the PDH, causing SX to outstrip OX in both learner groups (see Section 6.4.2).

Now that the scores of the three relativizers, namely *wh*-operators, *that*, and null relativizers, have been described in detail, a comparison between them can be made. Figure 14 below compares the average RRC and NRRC scores of both learner groups classified by the relativizer involved.

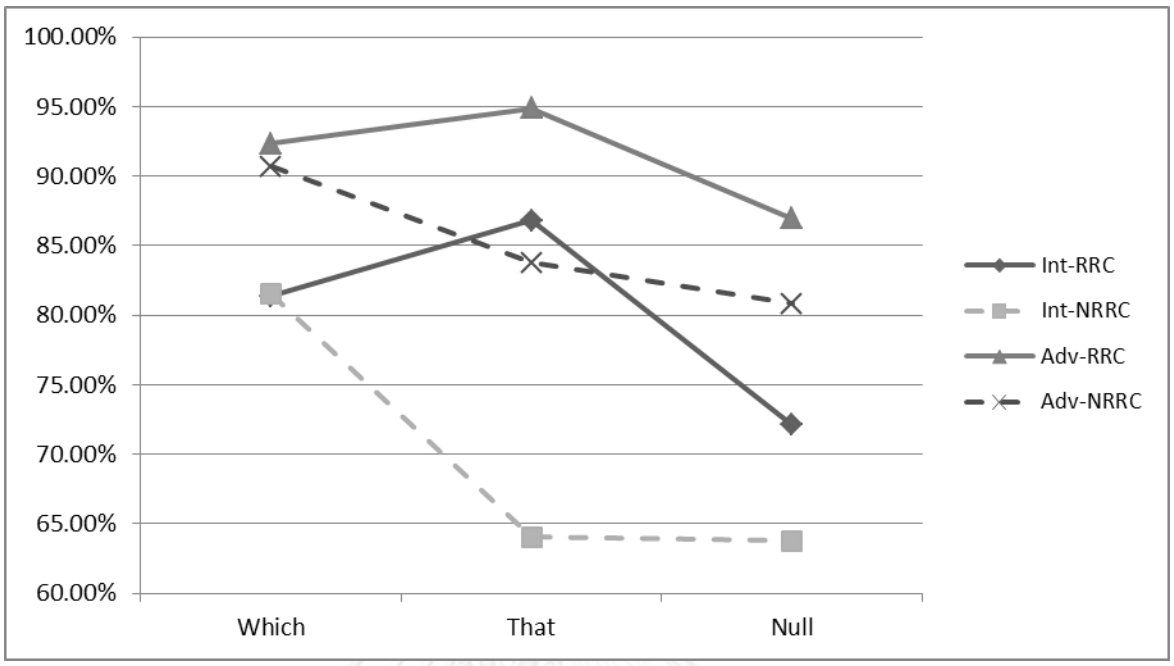

Figure 14: A comparison of the average scores on judgment of RCs with *wh*-operators, *that*, and null relativizers of the learner groups in the grammaticality judgment task

A few interesting trends pertaining to relativizers emerged here. First, *that* appeared to be the easiest relativizer for RRCs (represented by the unbroken lines), which was consistent with the finding in Task 1 (see Figure 6 in 5.1.4.3). There were a few possible explanations for this phenomenon, which will be discussed in Section 6.5.2.

Second, the learner groups were most accurate with *wh*-operators in NRRCs (represented by the dotted lines). This might be ascribed to the fact that *wh*-operators are always allowed in NRRCs (See 6.5.1). Another explanation is that the

learners might have partially acquired the use of *that* and null relativizers in RRCs and overgeneralized their usage to NRRCs. This would explain the dip in the NRRCs scores with errors involving *that* and null relativizers in both learner groups (discussed in detail in 6.5.1 and 6.5.3).

Last of all, null relativizers seemed to be the most challenging relativizer in both RRCs and NRRCs for the learners. This could be due to L1 influence and the nature of the task (discussed in detail in Section 6.5.3).

5.2.4.4 Resumptive pronoun

The first type of RC-related errors studied in this research was pronoun retention. The scores on RRC items testing errors involving resumptive pronouns of all subject groups are presented below in Table 60.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	75.83%	76.67%	70.00%	71.67%	65.00%	63.33%	70.42%
Advanced	90.83% (+15.00%)	90.00% (+13.33%)	87.50% (+17.50%)	90.00% (+18.33%)	84.17% (+19.17%)	85.83% (+22.50%)	88.06% (+17.64%)

Table 60: Accuracy scores on judgment of each RRC type with a resumptive pronoun

For the intermediate group, the average score was 70.42%. The subtype with the highest accuracy score was OS (76.67%). Next came SS (75.83%), OO (71.67%), SO (70.00%), SOPREP (65.00%), and OOPREP (63.33%).

The advanced group had the average score of 88.06%. The highest accuracy score went to SS (90.83%), followed by OS and OO (90.00%). Next in the order were SO (87.50%), OOPREP (85.83%), and SOPREP (84.17%).

The percentages in parentheses were all indicated by a plus symbol, suggesting that the higher the proficiency level, the more accurate the subjects could judge RRCs with resumptive pronouns to be incorrect.

The scores in Table 60 described above are arranged from highest to lowest in charts shown below in (85).

(85) Accuracy scores on judgment of each RRC type with a resumptive pronoun arranged from highest to lowest

Intermediate group:

OS	>	SS	>	OO	>	SO	>	SOPREP	>	OOPREP
(76.67%)		(75.83%)		(71.67%)		(70.00%)		(65.00%)		(63.33%)

Advanced group:

SS	>	OS	=	OO	>	SO	>	OOPREP	>	SOPREP
(90.83%)		(90.00%)		(90.00%)		(87.50%)		(85.83%)		(84.17%)

To explore whether the data was influenced by any of the three RC-related hypotheses, the scores were sorted by different criteria below. First of all, to test the effect of the NPAH, the scores on RRCs with resumptive pronouns were sorted by the grammatical role of the relativized material as shown below in Table 61.

Groups/RC types	XS	XO	XOPREP
Intermediate	76.25%	70.83%	64.17%
Advanced	90.42%	88.75%	85.00%

Table 61: Average accuracy scores on judgment of each RRC type with resumptive pronouns based on the grammatical role of the relativized material in the grammaticality judgment task

It can be seen that in the learner groups, the highest scores fell on XS (76.25% for the intermediate group and 90.42% for the advanced group), followed by XO (70.83% for the intermediate group and 88.75% for the advanced group), and XOPREP (64.17% for the intermediate group and 85.00% for the advanced group), respectively, as predicted by the NPAH and shown in the overall results.

The fact that the learner data lent full support to the NPAH meant that it indirectly supported the resumptive pronoun hierarchy, which is a reverse of the NPAH, as well. That is, the learners were least accurate with XOPREP and grew more accurate with XO and XS respectively. The data, thus, lent support to both hierarchies.

As for the effect of the PDH, the scores of RRCs with resumptive pronouns arranged by the grammatical role of the RC head noun are shown in Table 62 below.

Groups/RC types	SX	OX
Intermediate	70.28%	70.56%
Advanced	87.50%	88.61%

Table 62: Average accuracy scores on judgment of each RRC type with null relativizers based on the grammatical role of the head noun in the grammaticality judgment task

For both learner groups, the OX scores (70.56% for the intermediate group and 88.61% for the advanced group) were higher than the SX scores (70.28% for the intermediate group and 87.50% for the advanced group), although the score difference in the intermediate group was very slight (0.28%). Overall, therefore, it seemed that the PDH still applied, albeit to a limited extent.

Last but not least, a comparison between the accuracy score orders presented above in (85) and the order postulated by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP) was made. Similar to what was found in both tasks, the orders in this set of data did not match the SOHH difficulty order and, thus, did not support the hypothesis.

As for NRRCs, the distribution of the scores of the learner groups on resumptive pronouns is shown below in Table 63.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	73.33%	73.33%	71.67%	70.00%	67.50%	65.83%	70.28%
Advanced	91.67% (+18.33%)	89.17% (+15.83%)	88.33% (+16.67%)	87.50% (+17.50%)	86.67% (+19.17%)	81.67% (+15.83%)	87.50% (+17.22%)

Table 63: Accuracy scores on judgment of each NRRC type with a resumptive pronoun

For the intermediate group, the average score was 70.28%. SS and OS shared the same highest score slots (73.33%). Next in the order were SO (71.67%), OO (70.00%), SOPREP (67.50%), and OOPREP (65.83%).

The advanced group had the average score of 87.50%. The highest accuracy score fell on SS (91.67%), followed by OS (89.17%), SO (88.33%), OO (87.50%), SOPREP (86.67%), and OOPREP (81.67%).

It should also be noted that the score differences in parentheses were all in the plus, mirroring the proficiency-related progression found throughout the data earlier.

The scores on NRRCs with resumptive pronouns described above are arranged into high-to-low orders in (86) below.

(86) Accuracy scores on judgment of each NRRC type with a resumptive pronoun arranged from highest to lowest

Intermediate group:

SS	=	OS	>	SO	>	OO	>	SOPREP	>	OOPREP
(73.33%)		(73.33%)		(71.67%)		(70.00%)		(67.50%)		(65.83%)

Advanced group:

SS	>	OS	>	SO	>	OO	>	SOPREP	>	OOPREP
(91.67%)		(89.17%)		(88.33%)		(87.50%)		(86.67%)		(81.67%)

The scores were also sorted by different categories to plumb the influence of the three RC-related hypotheses in this set of data. In Table 64 below, the scores on NRRCs featuring resumptive pronouns of all subject groups were sorted on the basis of the grammatical role of the relativized material.

Groups/RC types	XS	XO	XOPREP
Intermediate	73.33%	70.83%	66.67%
Advanced	90.42%	87.92%	84.17%

Table 64: Average accuracy scores on judgment of each NRRC type with resumptive pronouns based on the grammatical role of the relativized material in the grammaticality judgment task

It can be seen that in the learner groups, the highest scores fell on XS (73.33% for the intermediate group and 90.42% for the advanced group), followed by XO (70.83% for the intermediate group and 87.92% for the advanced group), and XOPREP (66.67% for the intermediate group and 84.17% for the advanced group), respectively, as predicted by the NPAH and seen as a motif in the overall results. The results appear to be largely in keeping with the data throughout Task 2 that indicated that the influence of the NPAH could be seen in both RRCs and NRRCs. That is, the restrictiveness did not seem to dictate whether the NPAH was going to apply or not. This will be further discussed below in Section 6.4.1.

As for the effect of the PDH, the scores of NRRCs with resumptive pronouns sorted by the grammatical role of the RC head noun are shown in Table 65 below.

Groups/RC types	SX	OX
Intermediate	70.83%	69.72%
Advanced	88.89%	86.11%

Table 65: Average accuracy scores on judgment of each NRRC type with null relativizers based on the grammatical role of the head noun in the grammaticality judgment task

The effect of the PDH were not observed in both the intermediate and advanced groups, with the SX scores (70.83% for the intermediate group and 88.89% for the advanced group) staying ahead of the OX scores (69.72% for the intermediate group and 86.11% for the advanced group). It should be noted that the score difference in the intermediate group was slight (1.11%). The results pointed to the possibility that NRRCs were susceptible to influence of some factors other than that of the PDH (see Section 6.4.2).

As for the influence of the SOHH, the accuracy score orders presented above in (86) were compared to the order posited under the SOHH (OS > OO/SS > SO/OPREP > SOPREP). Consistent with earlier findings, none of the orders yielded by this set of data was congruous with the discontinuity-motivated order postulated by the SOHH.

Now that the descriptions of both RRC and NRRC scores have been given, a comparison can be carried out. Figure 15 below plots the average scores of RRCs and NRRCs with resumptive pronouns.

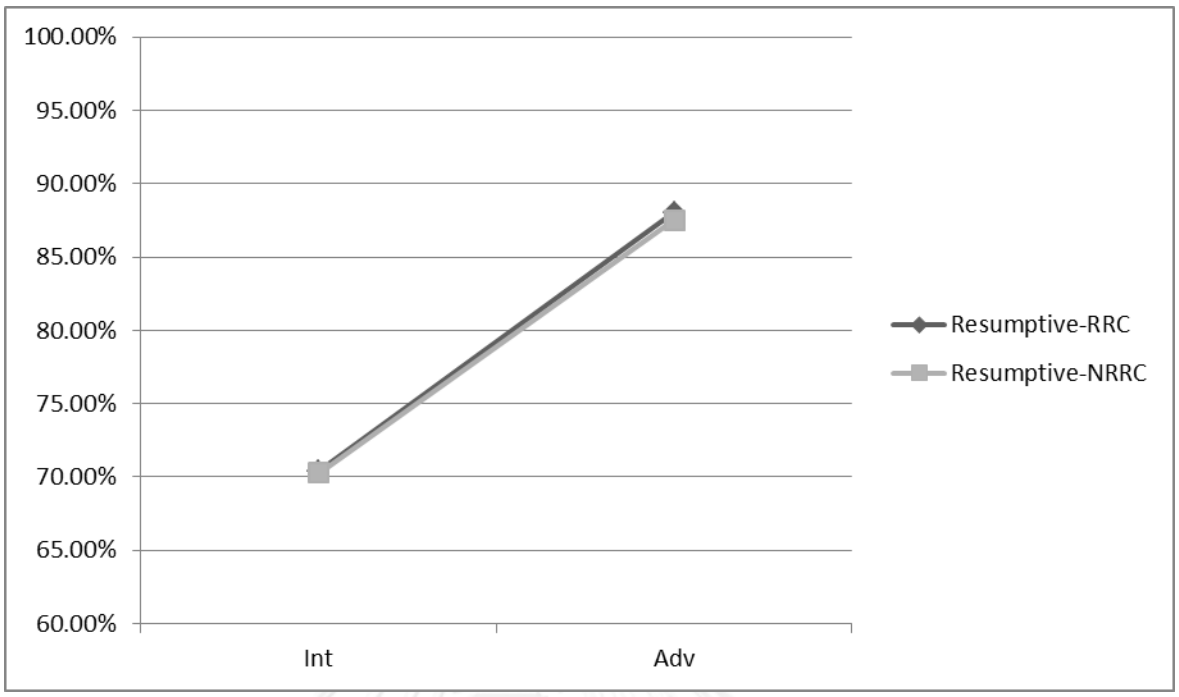

Figure 15: Progression of scores on judgment of RRCs and NRRCs with resumptive pronouns in the learner groups in the grammaticality judgment task

It can be seen that there seemed to be very little difference between the RRC and NRRC scores. That is, whether a resumptive pronoun appeared in a RRC or a NRRC, the subjects could judge it as ungrammatical with a more or less equal degree of accuracy. An explanation for this phenomenon is provided in Section 6.5.4. In addition, it should be noted that the proficiency-related progression was also evident in the chart. While this suggested that over time, learners could grow even more accurate in judging pronoun retention as ungrammatical, explaining why was

not simple. This is because there seems to be more than one explanation. This will be dealt with in the discussion in Section 6.5.4 as well.

5.2.4.5 Doubly-filled CP

The other type of error tested in Task 2 was doubly-fill CPs, while result in ungrammaticality in both RRCs and NRRCs. For RRCs, the scores on items testing doubly-filled CPs of all subject groups are shown in Table 66 below.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	91.67%	90.00%	85.83%	90.83%	83.33%	85.83%	87.92%
Advanced	95.83% (+4.17%)	94.17% (+4.17%)	93.33% (+7.50%)	95.83% (+5.00%)	91.67% (+8.33%)	93.33% (+7.50%)	94.03% (+6.11%)

Table 66: Accuracy scores on judgment of each RRC subtype with a doubly-filled CP

For the intermediate group, the average score was 87.92%. The highest accuracy score belonged to SS (91.67%). The order then went from OO (90.83%), OS (90.00%), SO and OPREP (85.83%) to SOPREP (83.33%).

The advance group had the average accuracy score of 94.03%. SS and OO shared the top spot (95.83%), followed by OS (94.17%), while SO and OOPREP shared the third spot (93.33%). SOPREP came in last at 91.67%.

It can be seen that the score differences in parentheses were all in the plus, suggesting that a proficiency-related progression was also evident in this set of data. That is, as learners grew more proficient, they would be able to parse RCs better and spot errors when the CP was filled by both an overt *wh*-operator and a complementizer.

The scores on RRCs with doubly-filled CPs of all subject groups are arranged from high to low and presented schematically in (87) below.

(87) Accuracy scores on judgment of each RRC type with a doubly-filled CP arranged from highest to lowest

Intermediate group:

SS	>	OO	>	OS	>	SO	>	SOPREP	>	OOPREP
(91.67%)		(90.83%)		(90.00%)		(85.83%)		(83.33%)		(85.83%)

Advanced group:

SS	=	OO	=	OS	>	SO	=	OOPREP	>	SOPREP
(95.83%)		(95.83%)		(94.17%)		(93.33%)		(93.33%)		(91.67%)

To look into the effect of the NPAH in this set of data, the scores of RRCs with doubly-filled CPs were also sorted by the grammatical role of the relativized material, as shown in Table 67 below.

Groups/RC types	XS	XO	XOPREP
Intermediate	90.83%	88.33%	84.58%
Advanced	95.00%	94.58%	92.50%

Table 67: Average accuracy scores on judgment of each RRC type with doubly-filled CPs based on the grammatical role of the relativized material in the grammaticality judgment task

In both learner groups, the highest scores fell on XS (90.83% for the intermediate group and 95.00% for the advanced group), followed by XO (88.33% for the intermediate group and 94.58% for the advanced group), and XOPREP (84.58% for the intermediate group and 92.50% for the advanced group), respectively, as predicted by the NPAH. Therefore, although doubly-filled is not allowed in L1 Thai, the fact that these scores showed some degree of influence of the NPAH suggested that the effect of the accessibility hierarchy might go beyond what has already been posited about it. That is, although the NPAH makes postulations only about well-

formed RCs and resumptive pronouns, the results suggested that the NPAH might also be applicable to other types of errors.

As for the effect of the PDH, the scores of RRCs with doubly-filled CPs arranged by the grammatical role of the RC head noun are shown in Table 68 below.

Groups/RC types	SX	OX
Intermediate	86.94%	88.89%
Advanced	93.61%	94.44%

Table 68: Average accuracy scores on judgment of each RRC type with doubly-filled CPs based on the grammatical role of the head noun in the grammaticality judgment task

In both learner groups, the OX scores (88.89% for the intermediate group and 94.44% for the advanced group) were higher than the SX scores (86.94% for the intermediate group and 93.61% for the advanced group) as posited by the PDH, suggesting that the effect of the PDH seemed to be present in the data, although to a lesser extent in the advanced group as the score difference was only 0.83%.

In terms of the effect of the SOHH, the difficulty order posited on the basis of discontinuities (OS > OO/SS > SO/OOPREP > SOPREP) was compared to the

accuracy score orders presented above in (87). In keeping with the data earlier, the results did not match the order postulated under the SOHH.

As for NRRCs, the distribution of the scores on items with errors involving doubly-filled CPs across all subtypes and subject groups are presented below in Table 69.

Groups/RC types	SS	OS	SO	OO	SOPREP	OOPREP	Average
Intermediate	88.33%	87.50%	87.50%	85.83%	83.33%	82.50%	85.83%
Advanced	95.00% (+6.67)	93.33% (+5.83%)	94.17% (+6.67)	94.17% (+8.33%)	92.50% (+9.17%)	94.17% (+11.67%)	93.89% (+8.06%)

Table 69: Accuracy scores on judgment of each NRRC type with a doubly-filled CP

The average score of the intermediate group was 85.83%. The highest accuracy score fell on SS (88.33%). Next in the order were SOPREP (83.33%), OS and SO (87.50%), OO (85.83%), and OOPREP (82.50%).

For the advanced group, the average score was 93.89%. The subtype with the highest score was 95.00%, followed by SO, OO, and OOPREP (94.17%), OS 93.33%, and SOPREP (92.50%).

The between-group score differences in parentheses were all indicated by a plus symbol, suggesting that the learners grew more accurate in judging this type of error in NRRCs along the developmental path of their RC acquisition.

The scores on NRRCs with doubly-filled CPs of all subject groups are presented from high to low schematically in (84).

(84) Accuracy scores on judgment of each NRRC type with a doubly-filled CP arranged from highest to lowest

Intermediate group:

SS	>	OS	=	SO	>	SO	>	SOPREP	>	OOPREP
(88.33%)		(87.50%)		(87.50%)		(85.83%)		(83.33%)		(82.50%)

Advanced group:

SS	>	SO	=	OO	=	OOPREP	>	OS	>	SOPREP
(95.00%)		(94.17%)		(94.17%)		(94.17%)		(93.33%)		(92.50%)

In order to detect the presence of the influence of the NPAH in this set of data, the scores on NRRCs with doubly-filled CPs were sorted by the grammatical role of the relativized material, as shown below in Table 70.

Groups/RC types	XS	XO	XOPREP
Intermediate	87.92%	86.67%	82.92%
Advanced	94.17%	94.17%	93.33%

Table 70: Average accuracy scores on judgment of each NRRC type with doubly-filled CPs based on the grammatical role of the relativized material in the grammaticality judgment task

It seemed that only the data of the intermediate group strictly followed the prediction of the NPAH, with the XS score (87.92%) being higher than the XO (86.67%) and XOPREP (82.92%) counterparts, respectively. In the advanced group, although XOPREP was the subtype with the least accuracy score as predicted by the NPAH, the XS and XO score were tied at 94.17%, defying the prediction that XS should be easier. The results hinted at an inherently complex nature of XOPREP compared to XS and XO.

To gauge the effect of the PDH, the scores of NRRCs with doubly-filled CPs sorted by the grammatical role of the RC head noun are shown in Table 71 below.

Groups/RC types	SX	OX
Intermediate	86.39%	85.28%
Advanced	93.89%	93.89%

Table 71: Average accuracy scores on judgment of each NRRC type with doubly-filled CPs based on the grammatical role of the head noun in the grammaticality judgment task

The influence of the PDH seemed not to be present in both learner groups. In the intermediate group, the SX (86.39%) was higher than the OX (85.28%) by 1.11%, defying the prediction made by the PDH that OX should have been easier. Similarly, in the advanced group, OX did not appear to be easier as its score tied with the SX score (93.89%).

As for the effect of the SOHH, the score orders presented above in (84) was compared to the difficulty claimed to be valid by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP). Again, this order was not borne out by this set of data as no match was found.

With the score distributions of RRCs and NRRCs with doubly-filled CPs described above, a comparison can now be made between them. Figure 16 below charts the average RRC and NRRC scores of the learner groups.

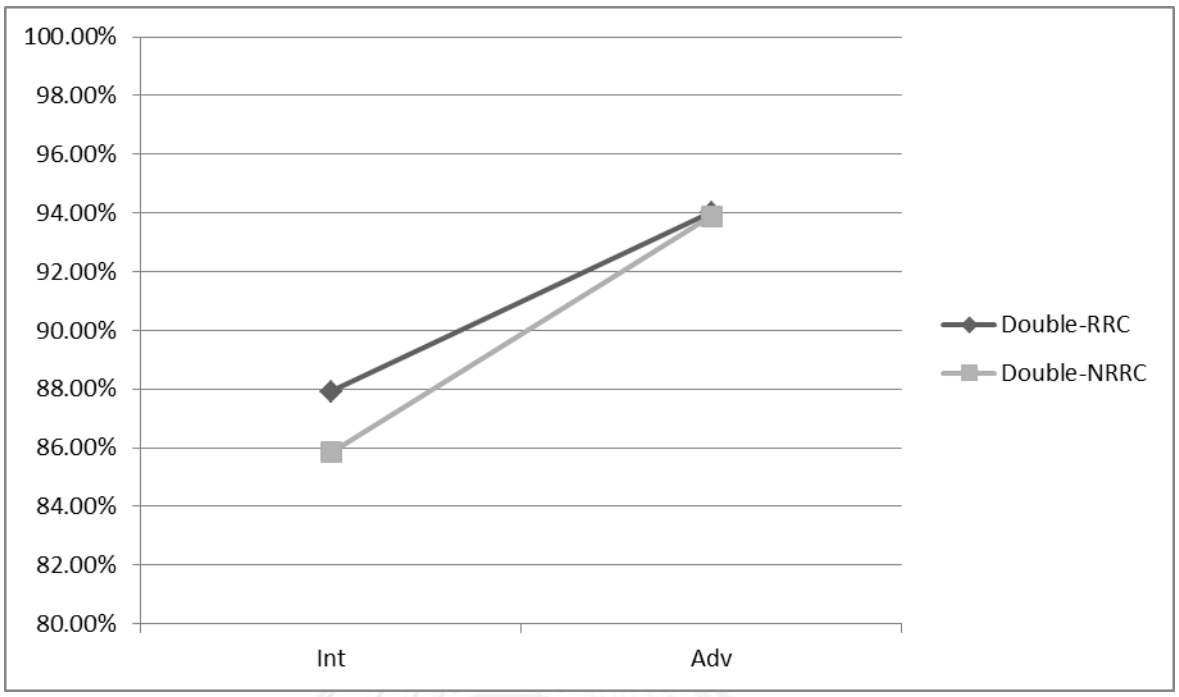

Figure 16: Progression of scores on judgment of RRCs and NRRCs with doubly-filled CPs in the learner groups in the grammaticality judgment task

Across the subject groups, the NRRCs scores were slightly lower, in line with the tendency found in both tasks. An interesting point lies in the fact that a proficiency-related progression was present even for such a glaring type of error as doubly-filled CPs. Some possible explanations will be given in Section 6.5.5.

To put the scores on the three relativizers (*wh*-operator, *that*, and null relativizer) and the two RC-related errors (pronoun retention and doubly-filled CPs) into perspective, Figure 17 charts the average RRC and NRRC scores of each proficiency group.

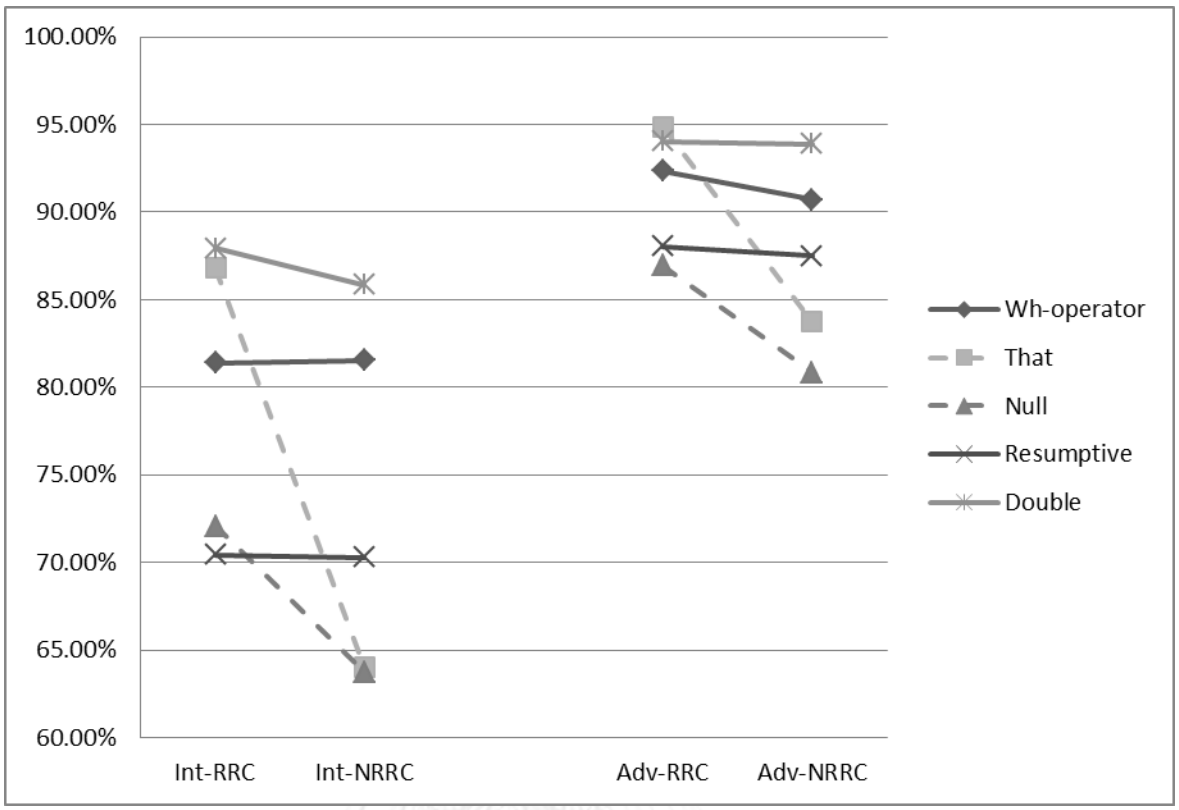

Figure 17: Average RRC and NRRC scores on the three relativizers and two RC-related errors in the learner groups.

Apart from the three trends about the three relativizers mentioned in 5.2.4.3 above (*that* was the easiest relativizer in RRCs, *wh*-operators were the easiest relativizer in NRRCs, and null relativizers were the most difficult relativizer in both RRCs and NRRCs), two more tendencies emerged when resumptive pronouns and doubly-filled CPs were thrown into the mix. First of all, it can be seen that the scores on errors involving doubly-filled CPs (the lines with asterisk nodes) were very high across all subject groups. It can be seen that these lines stayed above all the other

lines (except *that* in RRCs in the advanced group). The phenomenon suggested that this type of error was indeed glaring even to the intermediate subjects. Some possible explanations will be given in Section 6.5.5.

Second, the average scores on resumptive pronouns (the lines with X nodes) in both learner groups were quite low. Apart from the fact that the accuracy scores did not seem to be affected by the distinction between RRC and NRRC as mentioned above in 5.2.4.4, it can be seen that resumptive pronouns in RRCS posed more trouble to the learners than did *wh*-operator and *that* (and also null relativizers for the intermediate learners). As for NRRCs, while pronoun retention seemed to be less challenging than *that* and null relativizers, both of which were not allowed in NRRCs, resumptive pronouns still remained more difficult than *wh*-operators. Attempts will be made to explain this tendency for learners to struggle with pronoun retention in Section 6.5.4.

The trends that emerged from the results of both sentence interpretation task and grammaticality judgment task will be discussed in detail in the next chapter.

Chapter 6

Discussion

In this chapter, the trends demonstrated in the data will be discussed in terms of possible explanations. This section will be divided into subsections, dedicated to each aspect of the study; namely, proficiency-related progression, RRCs and NRRCs acquisition, difficulty orders, the three RC-related hypotheses, and relativizers and RC-related errors.

6.1 Proficiency-related progression

All through the data in both tasks, it can be seen that the higher the proficiency level was, the higher the accuracy scores (see Table 11 in 5.1.1 and Table 30 in 5.2.1). This tendency also manifested itself at a closer look throughout Tasks 1 and 2. This trend, as opposed to the one in which learners' performance did not improve with increasing proficiency levels, suggested that RRCs and NRRCs can be acquired by L1 Thai learners, corroborating the findings of Amornwongpeeti and Pongpairoj (2013). That is, although they might not have exhibited complete mastery of the constructions at lower level of proficiency, learners can become more and

more accurate as they develop along the acquisition trajectory and even grow close to native speakers in certain aspects. The conclusion is consistent with Phoocharoensil (2009) and Amornwongpeeti and Pongpairoj (2013) with respect to RRCs (NRRCs were not studied exhaustively in both works,).

The most likely explanation as to why English RRCs and NRRCs can be acquired by Thai learners lies in L1 influence[6], which refers to the tendency for learners to use the forms and meanings in their first language in the target language (Gass & Selinker, 2008, p. 519). As shown in Chapter 2 (see Table 4 in 2.4), English and Thai RCs share a number of common characteristics, which can facilitate the acquisition of English RCs. That is, because both English and Thai RCs are external-headed, right-embedded, and postnominal, as well as use the gap strategy and allow every grammatical role to be relativized as mentioned in Section 2.3.1, the influence

[6] L1 Influence is one of the five psycholinguistic processes identified by Selinker (1972) to be relevant to the construction of the linguistic system of adult L2 learners, which is known as interlanguage (IL) (see footnote 4). Selinker proposed five processes that learners employ in the shaping of their interlanguage. Because these processes were claimed to be part of the psychological structure, which is latent and activated when L2 acquisition takes place, Selinker called them psycholinguistic processes. The five processes are as follows: (1) Language transfer – the transferal of rules or systems from another language into learners' interlanguage; (2) Transfer of training – the influence of instruction or training procedures on learners' interlanguage; (3) Strategies of second language learning – approaches that learners employ in acquiring L2 material; (4) Strategies of second language communication – approaches that learners employ to communicate in L2.; (5) Overgeneralization of target language material – the overgeneralization of L2 features.

of these similarities allows L1 Thai learners to acquire L2 English RCs with greater ease.

6.2 RRCs and NRRCs

The subjects were shown to be able to make a distinction between RRCs and NRRCs. This could be ascribed to L1 transfer. That is, because Thai also encodes the distinction between the two types of RCs, although the encoding methods have not been examined exhaustively (see Section 2.3.3), the subjects were primed to better classify RCs as restrictive and non-restrictive and to better grasp the differences in forms and functions between the two types.

Also evident throughout the results of Tasks 1 and 2 was the tendency for the subjects to be more accurate with RRCs than with NRRCs (see Figure 1 in 5.1.1 and Figure 7 in 5.2.1). That is, although the learners appeared to be able to acquire English RCs, their performance on RRCs always stayed slightly ahead of that on NRRCs. As the acquisition of RRCs and NRRCs has never been examined thoroughly side by side in the literature, whether this phenomenon is common across L1s has yet to be explored.

There are a few possible explanations for this phenomenon. First, the asymmetry could be ascribed to the frequencies with which RRCs and NRRCs are used. As mentioned earlier, Biber et al. (1999, p. 603) found in their corpus study that RRCs are more common than NRRCs in all written genres. To be more precise, NRRCs account for only 15% of all RCs in fiction and academic prose. This number goes up to only 30% in news. Because humans have been shown to be sensitive to frequency to linguistic events (Ellis, 2002, cited in Robinson & Ellis, 2008, p. 46) the evidence that NRRCs are less common suggests that it is possible that because learners were less exposed to NRRCs than to RRCs, they were, thus, not able to acquire NRRCs at the same rate as RRCs and, as a result, they were not as accurate with NRRCs as they were with RRCs.

The frequencies mentioned above are linked to the second explanation. That is, RRCs are claimed to be more prototypical to the category of RC than NRRCs are. As mentioned in Chapter 2 (see 2.1.3), Comrie (1989, p. 139) claims that NRRCs are less central to the notion of RCs than RRCs. This claim seems to be confirmed by the amount of research poured into RRCs when compared to research dedicated to NRRCs. This prototype claim is also linked to frequency, which is said to determine the prototype of a category (Bybee, 2001, cited in Robinson & Ellis, 2008, p. 46). As

prototypes are more salient, they can positively affect L2 development (Robinson & Ellis, 2008, p. 7). The positive effects of salience on L2 acquisition have been demonstrated in a number of studies across different linguistic areas (such as Carroll & Shea, 2007, on prosody ; Goldschneider & DeKeyser, 2001, on L2 morpheme acquisition; Trenkic & Pongpairoj, 2013, on L2 article use) Therefore, it is possible that the subjects were more accurate on RRCs than NRRCs because RRCs are more prototypical and, thus, more salient.

Another possible explanation lies in the textbooks that these learners were exposed to. Five textbooks that Thai high school students used in secondary school were sampled (*New Inside Out – Intermediate* (Kay & Jones, 2009, p. 89), *New English File – Intermediate* (Oxenden & Latham-Koenig, 2006, pp. 92-95), *American Headway 4* (Soars & Soars, 2005, p. 67), *Solutions – Intermediate* (Falla & Davies, 2012, pp. 25-27), and *Knock Out*: *First Certificate* (May, 1999, p. 70)). It turned out that in every single one of them, RRCs are introduced before NRRCs. Even when the main topic in the lesson is RCs, RRCs are taught first. The reason behind this phenomenon may be linked to the first two explanations; that is, RRCs are more common than NRRCs and are more prototypical of RCs. As a consequence, these learners might have developed a notion that RRCs were more central to RCs and perceived NRRCs as

secondary. In addition, the tendency for NRRCs to be introduced after RRCs have been taught also appears in English grammar textbooks. Five commercial textbooks by international publishers were sampled (*Macmillan English Grammar in Context – Advanced* (Vince, 2008, p. 158), *Advanced Grammar in Use* (Hewings, 2005, p. 106), *Oxford English Grammar Course* (Swan & Walter, 2011, p. 208. 210), *Oxford Practice Grammar* (Yule, 2006, p. 174), and *Understanding and Using English Grammar* (Azar, 2002, p. 281)), and, to no surprise, not in any of these five books are NRRCs taught before RRCs. Because of such reinforcement, the asymmetry between RRC and NRRC acquisition evident in the data is understandable.

6.3 Difficulty orders

A number of studies have been conducted in pursuit of the difficulty order in the acquisition of RCs. However, the results from this study varied considerably and did not yield any conclusive order for each subject group. Although generally SS was shown to be the easiest RC subtype across the data, the remaining subtypes did not remain constant.

A possible explanation for this is that the difficulty order was governed by a conglomerate of factors, whose dynamics and relationships were not straightforward. For example, the NPAH and the PDH were shown to be at play in the data. However,

the extent to which they held sway over the data could vary, which could, in turn, alter the difficulty order. To illustrate the point, an extreme example is in order. If the NPAH effect has more influence on the data than the effect of the PDH, the difficulty order yielded might be SS > OS > SO > OO > SOPREP > OOPREP. However, if the scenario is reversed, the difficulty order might turn out to be SS > SO > SOPREP > OS > OO > OOPREP. In both cases, the accessibility hierarchy and the perceptual difficulty still apply. As it is very unlikely for the two hypotheses to exert their influence on the data at an equal degree under every circumstance, it is only natural that the orders found in the current study exhibit a degree of variety.

That these two hypotheses can exert their influence simultaneously but their interaction is not straightforward entails that the order of difficulty is dynamic. Therefore, any attempt to pigeonhole each subtype into a particular place in a rigid difficulty order might be a fruitless enterprise. Rather, it might be more useful, especially for pedagogical purposes, to acknowledge what factors are at play and what effects they can have in anticipating areas where difficulties could arise (See 7.2).

6.4 The three RC-related hypotheses

Attempts will be made in order to offer some explanations for the trends related to the three RC-related hypotheses that have been found in the data. For the NPAH and PDH, explanations given are based on the assumption that the failure of the difficulty orders to strictly adhere to the postulations made by these hypotheses does not deny the presence of their influence, but rather indicates that there is an interplay between these hypotheses, whose influence can be observed when the data is teased apart.

6.4.1 The NPAH

Based on the grammatical role of the gap, the NPAH predicts that XS is easier than XO, and XO is easier than XOPREP. When other factors were excluded and only the grammatical role of the gap was considered, a trend became evident; despite the fact that the NPAH was only partially supported in certain sets of data, the overall results lent support to this hypothesis (see Figure 3 in 5.1.3.1 and Figure 9 in 5.2.3.1). The results were consistent with a number of studies, including Gass (1979, 1980), Eckman et al. (1988), Yip and Matthews (1991), Hsin and Wang (2005), and Phoocharoensil (2009), all of which point out the role that the NPAH has on the acquisition of RCs (see 3.2 and 3.3). It should also be noted that the influence of the

NPAH was also present in the NRRC data, adding a new piece of information to the literature on RC acquisition and the NPAH.

With the trend established, it should be pointed out that although the orders found in this study did not strictly follow the order the NPAH postulates, it is possibly because the orders were also influenced by the PDH. In other words, the validity of the accessibility hierarchy was still supported in this study even though the difficulty orders did not appear to be exactly as postulated by the NPAH.

The results were also borne out by corpus findings. Biber et al. (1999, pp. 621-622) show that RCs with subject gaps or XS are the most common subtype of RCs, found 55% in conversation and fiction and 75% in news and academic prose. Biber et al. claim that this is because XS is easier to process than non-XS as no clause element is displaced from its normal position[7].

[7] Apart from XS RCs, the other subtypes of RCs involve some sort of clause element displacement.

(i) XS the cake [that was in the fridge]

(ii) XO the cake[that I ate]

In (i), *that*, which functions as the subject in the RC, is not moved from its subject position in the RC. However, in (ii), *that*, which functions as an object in the RC, is moved from its object position after the verb *ate* to precede the subject *I*. This type of displacement or movement is claimed by Biber et al. to make the statement more difficult to process.

6.4.2 The PDH

The PDH makes its predictions based on the notion of perceptual difficulty, claiming that RCs that modify subject head nouns, and thus intervene between subjects and verbs, are difficult than RCs that modify object head nouns. The overall results of the study are quite interesting in that there seem to be two contradicting trends for RRCs and NRRCs.

For RRCs, the PDH was generally supported (see Figure 4 in 5.1.3.2 and Figure 10 in 5.2.3.2) in both tasks. That is, OX was shown to be slightly easier than SX. The results appeared to be consistent with a number of studies, such as Ioup and Kruse (1977), Schumann (1980), Iwami (1991), Izumi (2003), and Phoocharoensil (2009). These studies have indicated that OX poses less trouble to learners than SX and can be acquired more easily.

Apart from the perceptual difficulty as an explanation for this phenomenon (see 3.1.2), another possible factor reinforcing the results lies in the frequency of SX. Biber et al. (1999, p. 623) find that SX accounts for only 10-15% of all RCs across different registers. Because SX is considerably rarer than OX, it is possible that the learners received lesser exposure to SX as well, and as a result, did not acquire SX at the same rate as OX.

However, as noted above that OX was shown to be only slightly easier than SX (see Table 18 in 5.1.3.2 and Table 37 in 5.2.3.2), there was another interesting factor worth discussing. That is, the written data revealed that the learner subjects had been trained to parse SX. Many learners put parentheses around SX to make sure they could find the subject and the verbs on either side. This technique could be ascribed to instructions in tutorial schools. To help students deal with national examinations, many tutorial schools teach their students parsing techniques. This is evident in course materials from two popular tutorial schools (Enconcept and Kru Somsri), which teach students to parse RCs, especially SX, using parentheses. This technique even appeared in a course material for Brand's Summer Camp, a short cram event held annually and broadcast throughout the nation (Thammasarasopon et al., 2013, pp. 3, 191). Therefore, the results could be affected by transfer of training, one of the five cognitive processes that can influence learners' L2 acquisition (Selinker, 1972, cited in R. Ellis, 1994, p. 351). That is, because these learners might have been trained to use the technique, they could parse better and were less affected by the perceptual difficulty caused by SX.

As for NRRCs, the PDH was systematically contradicted (see Figure 4 in 5.1.3.2 and Figure 10 in 5.2.3.2) in both tasks. That is, the subjects were more

accurate with items testing SX than with items testing OX. However, instead of concluding that the PDH played no role in the NRRC data, an attempt will be made to give an alternative explanation that does not reject the PDH. That explanation has to do with prototypes. It is possible that the prototype of NRRCs is a NRRC whose head noun functions as a subject in the matrix clause. This is reflected in commercial English grammar textbooks by international publishers. In all of the five books that were sampled (*Macmillan English Grammar in Context – Advanced* (Vince, 2008, p. 158), *Advanced Grammar in Use* (Hewings, 2005, p. 106), *Oxford English Grammar Course* (Swan & Walter, 2011, pp. 208, 210), *Oxford Practice Grammar* (Yule, 2006, p. 174), and *Understanding and Using English Grammar* (Azar, 2002, p. 281)), NRRCs used to introduce this type of RC are all SX. To further test if SX-NRRCs are more prototypical than OX-NRRCs, the researcher sent out an informal online questionnaire to ten participants[8], asking them each to write one random sentence with an NRRC. Nine out of 10 NRRCs sent back to the researcher were SX. While it is acknowledged that the results were far from generalizable and whether the prototype of NRRCs is SX certainly requires a much more systematic and thorough

[8] All the participants had graduated from the Faculty of Arts, Chulalongkorn University for three years at the time of the administration of the questionnaire.

investigation, the results indicated the possibility that center-embedding NRRCs are more prototypical.

However, as the distinctions between RRCs and NRRCs in terms of linear syntactic arrangement do not involve factors that would make perceptual difficulties apply to only RRCs and not to NRRCs, the effect of the PDH will not be completely ruled out. Instead, it will be proposed that the PDH influence might be overridden by the prototype effect in the NRRC data.

6.4.3 The SOHH

The SOHH predicts that RCs with more discontinuities will be more difficult than those with fewer. The difficulty order postulated by the SOHH (OS > OO/SS > SO/OOPREP > SOPREP) was not borne out by the data of this study. As described earlier in 5.1.3.3, the order posited under the SOHH is too rigid to allow any deviation from what it claims. Thus, it naturally receives little support in the literature (e.g. Iwami, 1991) while a number of works that tried to incorporate the hypothesis (Flanigan, 1995; Izumi, 2003) found some contradictions.

Giving an explanation as to why the SOHH order is not supported by the data without attacking its theoretical basis is very difficult. The SOHH relies on the idea of discontinuities. It posits two types of discontinuities: those caused by

phrasal boundaries acting as an alternative explanation for the NPAH and those caused by center-embedding as an alternative for the PDH (see 3.1.3). However, by trying to unify two disjointed factors (the grammatical role of the gap and the grammatical role of the RC head noun) under a single umbrella notion (discontinuities), the SOHH disregards the possibility that the two types of discontinuities might not pose the same degree of difficulty and that the interplay between the NPAH and the PDH might be too complex to be boiled down to just the numbers of discontinuities. In doing so, not only does the SOHH allow virtually no room for deviation for the hypothesis to be valid, but any deviation also cannot be accounted for by the only explanation it relies on – discontinuity. One possible way for the SOHH to redeem itself without a major change in its theoretical basis is to acknowledge that the two types of discontinuities might differ in terms of the difficulty they pose to learners. However, in doing so, it will inevitably defy its own raison d'être as it is forced to acknowledge that the NPAH and the PDH cannot be explained using a single notion. Therefore, by disregarding the SOHH and relying on two separate hypotheses (the NPAH and the PDH) instead, one could better explain the overall trends in the data even when the difficulty orders posited under these hypotheses are not strictly adhered to.

6.5 Relativizers and RC-related errors

Under this section, explanations will be given to the trends related to these relativizers and error types that have been found in data.

6.5.1 *Wh*-operators

In RRCs, *wh*-operators seemed to be more difficult than *that* (see Figure 6 in 5.1.4.3 and Figure 17 in 5.2.4.5). The results were consistent with Phoocharoensil (2009), which finds that *who* and *which*, the two *wh*-operators included in the study, are acquired after *that*. There are at least two possible explanations for this. First of all, *wh*-operators simply involve more restrictions than *that*. In terms of semantic features, while *that* is [±human], *who* and *whom* are [+human] and *which* is [–human] (Celce-Murcia & Larsen-Freeman, 1999, p. 582), preventing these *wh*-operators from being used as freely as *that*. As for syntactic requirement, *whom* can only be used as an object while *that* is not restricted by the same requirement.

Another explanation has to do with L1 influence. It has been found in Amornwongpeeti and Pongpairoj (2013, pp. 58-61) that Thai learners can acquire a *wh*-movement in English as such a movement, albeit a covert one, exists in Thai.

However, because the *wh*-movement is covert in Thai, learners need more time to acquire the overt kind in English required in RCs with *wh*-operators. As a result, learners might be less accurate with *wh*-operators than with *that*, which does not involve *wh*-movement and whose L1 transfer can occur without switching from a covert kind to an overt one.

As for NRRCs data, *wh*-operators were shown to be consistently the easiest relativizer in NRRCs (see Figure 17 in 5.2.4.5). This might be ascribed to the fact that *wh*-operators are the only relativizer allowed in NRRCs (see 2.2.1.2). An additional explanation is provided in the discussion of *that* in NRRCs in 6.5.2

6.5.2 That

In RRCs, *that* appeared to be the easiest relativizer (see Figure 6 in 5.1.4.3 and Figure 17 in 5.2.4.5). The results were consistent with Phoocharoensil (2009, p. 251), which finds that L1 Thai learners acquire *that* before the other relativizers. This phenomenon can be accounted for by L1 influence. That is, because L1 Thai makes use of complementizers rather than *wh*-operators in RCs (see 2.3.1.2), the subjects were primed for the acquisition of the complementizer *that*. In addition, as a flip side of what has already been mentioned in 6.5.1 above, *that* also has the

fewest exceptions among these relativizers as it can be used with either human or non-human nouns the way *wh*-operators cannot. This could be another reason why learners will find *that* to be the easiest relativizer in RRCs.

However, in NRRCs, *that*, which is ungrammatical, appeared to pose more difficulty than *wh*-operators in the grammaticality judgment task (see Figure 17 in 5.2.4.5). One possible explanation for this phenomenon is overgeneralization (Selinker, 1972, cited in R. Ellis, 1994, p. 351). That is, the learner subject might have overgeneralized the usage of *that* in RRCs to also apply to NRRCs, resulting in ungrammaticality.

6.5.3 Null relativizers

Null relativizers or zero relativizers were shown to be the most challenging relativizer in both RRCs and NRRCs (see Figure 6 in 5.1.4.3 and Figure 17 in 5.2.4.5). The results were again consistent with Phoocharoensil (2009), which finds that L1 Thai learners acquire null relativizers later than *that*, *which*, and *who* (the latter two being the only two *wh*-operators included in this study).

A possible reason for null relativizers to be the most difficult relativizer might lie in L1 influence again. Although Yaowapat and Prasithrathsint

(2008, p. 16) assert that zero relativizer is allowed in Thai RCs (see 2.3.1.2), it is not specified if null relativizers are always allowed or if there need to be special circumstances for zero relativizer to be allowed. A counterexample to their claim can be seen in (85) below.

(85) a. **khon [thîi khăw chɔ̂:p]**

person REL 3SG like

the person that he/she likes

b. *** khon [ø khăw chɔ̂:p]**

person REL 3SG like

the person that he/she likes

In (85a), the RC with the complementizer /thîi/ is well-formed. However, when a zero relativizer is used, as in (85b), the RC becomes ill-formed. The example illustrated above suggests that the there are exceptions to the use of zero relativizer in Thai RCs. In other words, the use of zero relativizer in Thai is governed by a set of rules

that has yet to be studied thoroughly. However, these rules are very likely to differ from those in English RCs. An example is given in (86).

(86) **thîi nîi mii ʔaacaan [ø sɔ̌ɔn dii] lăay khon**

place this have teacher [teach good] several CLF

'This place has several teachers who teach well/skillfully.'

(Yaowapat & Prasithrathsint, 2008, p. 17)

While null relativizers are not allowed in XS in English RCs, they are obviously allowed in Thai RCs, at least in an example show above. Therefore, it is possible that these differences between L1 and L2 zero relativizers may pose problems to learners, causing the acquisition of L2 zero relativizer to lag behind that of the other relativizers.

In addition, null relativizers might be more difficult in reception tasks. If the learner's parsing ability has not been fully developed, there might be more chance for the learners to misjudge an RC with a null relativizer as it is not marked by any overt marker that helps in the parsing.

A case of overgeneralization in NRRC data also cannot be ruled out. That is, the learners might have overgeneralized the use of null relativizers in RRCs and extended it to NRRCs, resulting in lower judgment scores.

6.5.4 Resumptive pronouns

The data from Task 2 showed that the learner groups did not achieve perfect accuracy in judging the grammaticality of resumptive pronouns. Even in the advanced group, resumptive pronouns seemed to still pose a certain degree of difficulty (see Figure 17 in 5.2.4.5). There are at least two possible explanations for this phenomenon. First, a few studies, such as Gass (1979) and Hyltenstam (1984), have found pronoun retention to be a characteristic of RC acquisition, even when the learner's L1 does not make use of resumptive pronouns. In fact, pronoun retention has even been claimed to be unmarked, making it very likely for learners to retain pronouns (Braidi, 1999). Therefore, it is possible that the persisting problem involving resumptive pronouns shown in Task 2 might be a common characteristic of RC acquisition. Another explanation has to do with L1 influence. In recent literature, Thai RCs are said to allow pronoun retention (see 2.3.2). Although a comprehensive set of circumstances under which resumptive pronouns are allowed has yet to be

mapped out, the fact that there are environments that allow pronoun retention prevents L1 influence from being ruled out.

In addition, the influence of the NPAH on the resumptive pronouns can be seen in both RRCs and NRRCs (see Tables 60 and 63 in 5.2.4.4). The subjects were able to judge resumptive pronouns as incorrect more accurately in XS than in XO and than in XOPREP, respectively. The results, thus, also lent support to the Resumptive Pronoun Hierarchy, which is a reverse of the NPAH and posits that resumptive pronouns will be more persistent in more marked RC positions (see 3.1.1).

It should also be noted that the distinction between RRCs and NRRCs did not seem to influence their performance in judging resumptive pronouns as incorrect. This might be contributed to the fact that resumptive pronouns are not allowed in both types of RCs. In other words, because in English RCs, any pronoun retention will be deemed ungrammatical, the learners' performance regarding resumptive pronouns on RRCs and NRRCs appeared to be similar.

6.5.5 Doubly-filled CPs

Among all the topics tested in Task 2, the subjects seemed to be most accurate with errors involving doubly-filled CPs (see Figure 17 in 5.2.4.5). The reason behind this might lie in L1 influence. That is, because both Thai and English do not allowed doubly-filled CPs, the subjects were primed to not allow doubly-filled CPs in English as well. As for why the scores still reflected a proficiency-related progression (see Figure 16 in 5.2.4.5) if there was L1 influence, the reason might lie in the scoring system of the test that did not simply score on the basis of correct and incorrect but weighed in the confidence with which the learner answered. Very interestingly, the learners of the intermediate group did not get much more answers completely wrong than the advanced learners. However, they were not as confident in their answer, which in turn ratcheted their scores down. Nevertheless, this is not to say that the intermediate learners did not detect fewer errors. Unfortunately, the written data did not shed much light on the matter, except from the fact that most of those who provided corrections were aware that NRRCs do not allow *that* and thus chose to cross *that* out, leaving a *wh*-operator in the sentence.

All of the findings discussed in detail within this chapter will be linked to the hypotheses of the research in the next chapter, along with some of the pedagogical

implication, the limitations of the current study, and recommendations for future research.

Chapter 7

Conclusions, Implications, Limitations, and Recommendations

This chapter concludes the current study. The first section of this chapter summarizes the major findings detailed in Chapter 5 and discussed in Chapter 6 as well as evaluates the extent to which the hypotheses of the study were supported. Then, some implications, pedagogical and theoretical, are provided. The last two sections list some of the limitations of the study as well as point out some of the areas that have not yet been explored and could be topics of future research.

7.1 Conclusions

Conclusions will be made in response to the hypotheses of the study first. Then, other major findings not related to the hypotheses but worth mentioning will be given.

The first hypothesis of the study was that the three RC-related hypotheses would be equally applicable to both RRCs and NRRCs. The hypothesis was only partially supported. In terms of the acquisition orders posited by the three hypotheses, the results did not seem to support any (see 6.3). The orders yielded by

the data of both tasks pointed to the possibility that the difficulty orders were governed by more than one factor, and these factors interacted in such a way that did not allow the orders to perfectly conform to any single order posited by the three RC-related hypotheses. Therefore, in this respect, it had to be concluded that the three RC-related hypotheses failed equally in predicting the order of difficulty in both RRCs and NRRCs. However, in terms of the overall influence of these RC-related hypotheses, the NPAH was shown to apply to both RRCs and NRRCs (see 6.4.1). While the hypothesis was initially formed on RRC data, the results indicated that the NPAH could be extended to NRRCs. This was probably due to the fact that the distinctions between English RRCs and NRRCs do not involve any drastic changes in the linear syntactic arrangement that would otherwise affect the position of the grammatical role of the relativized material, the factor that the NPAH is hinged upon. Interestingly, the PDH had been shown to apply clearly only to the RRC data, contradicting the first hypothesis posed by the study. The NRRC data had consistently defied the effect of the PDH, and the current study has ascribed this phenomenon to the prototype effect. That is, because SX seems to be more prototypical of NRRCs than OX, the subjects were primed to score higher on items with SX. As for the SOHH, the results had systematically denied its influence. It was

concluded in the current study that the results were governed by a number of factors that could not be boiled down to merely the notion of discontinuity put forward by the SOHH. Therefore, the first hypothesis was supported only with regard to the overall influence of the NPAH. That is, the only thing that seemed to equally apply to RRCs and NRRCs is the influence of the NPAH.

The second hypothesis of the study stated that while the acquisition orders might be the same for RRCs and NRRCs, the rate at which each subtype of RC would be acquired might diverge for RRCs and NRRCs. This hypothesis was borne out by the results. Although the acquisition orders were shown to vary greatly, the rate at which the same RC type was acquired differed quite systematically, with NRRCs generally trailing behind RRCs for each RC type. This went hand in hand with the general trend for NRRCs to be more difficult than RRCs found throughout the study. The asymmetry was explained in terms of the unequal frequencies of RRCs and NRRCs, the prototype effect, and transfer of training. In addition, NRRCs also seemed to involve more restrictions on relativizers, which in turn predisposed the subjects to making more mistakes.

As for some other major findings, the results showed that while the difficulty order for relativizers from easiest to most difficult ran from *that* to *wh*-operators to

null relativizers in RRCs, *wh*-operators were easier than *that* in NRRCs, pointing to another area of divergence for the acquisition of RRCs and NRRCs. In addition, it was shown that the Thai learners in this study did experience a degree of difficulty with resumptive pronouns. The current study suggested two main candidates responsible for the results: L1 transfer and the general trend in learners across different L1s. Last but not least, doubly-filled CPs, not allowed in both L1 Thai and L2 English, posed the least trouble for the learners, possibly due to L1 transfer.

7.2 Pedagogical implications

As the results suggested that it would be more fruitful to acknowledge factors that influence learners' acquisition of RCs and the tendencies they bring about than to try to come up with a specific set of difficulty orders, the pedagogical implications provided here are therefore based on the overall influence of the NPAH and the PDH dealt with in this study

Because the results suggested that the effect of the grammatical role of the relativized material could be seen in both RRCs and NRRCs, it can thus be inferred that most learners will experience difficulty with certain RC subtypes such as

XOPREP. Teachers can use this tendency to inform their instruction to ensure that a special attention is given to this particular RC subtype.

Similarly, the difficulty of RRCs had been shown to be affected by their position in relation to their head noun as predicted by the PDH. Teachers can also use this tendency to anticipate problems that can arise with SX-RRCs. On the other hand, teachers might also want to bring OX-NRRCs to learners' attention as they have been found to be more difficult than the SX counterpart.

Apart from in-class instruction, the results also bear some implications for English textbooks. As the current study suggested that how RRCs and NRRCs were presented in textbooks might affect learners' acquisition of RCs, textbook makers might consider how to present NRRCs in such a way that diminishes the asymmetry between RRCs and NRRCs as well as helps learners with difficult RC subtypes, such OX-NRRCs, which have been shown to be underrepresented in the sampled English textbooks.

7.3 Limitations

Because of the scope of the current study, some other subtypes (IO, GEN, and OCOMP) were left out of the study for the rationale stated in Section 1.5. Also,

relative adverbs (e.g. ‘where,’ ‘when,’ and ‘why’) were not included because the NPAH does not consider them. Therefore, the results of the study provided only part of the whole picture.

In addition, only two tasks were used, both of which were reception-oriented. Without production-oriented tasks or simply more tasks, the generalizability of the conclusions reached and discussed in the study was limited.

Furthermore, because the study was cross-sectional in nature, the results yielded were snapshots of the performance of the learners at that particular moment rather than a continuous trajectory of their acquisition, which, in turn, could lead us to a better understanding of the learners’ development regarding RC acquisition.

Last but not least, because only one L1 was employed, the generalizability of the results was restricted to L1 Thai learners and could not be extended to other L1 backgrounds without more experiments.

7.4 Recommendations for future research

Because IO, GEN, and OCOMP, as well as relative adverbs were not included in the study, it would be interesting to also take these RC subtypes into account to see how they would fit into the picture.

In addition, future studies might incorporate production tasks (e.g. storytelling or essays) to see if the findings of this study will still be supported and if there will be points where the results from production tasks diverge from those of reception tasks in order to bolster our understanding of the effects of the task nature on learners' performance.

Also, because the results yielded were based on a cross-sectional study, our understanding of the acquisition of RRCs and NRRCs might benefit from a longitudinal study as well.

Furthermore, future studies might take on some even more challenging types of RCs such as reduced RRCs and NRRCs or free RCs in order to paint a more complete picture of RC acquisition.

Lastly, to better understand how the acquisition of RRCs and NRRCs diverge, more studies need to be conducted using learners of various L1 backgrounds. This is

in order to see if the influence of the NPAH and the PDH as well as the prototype effect still manifest themselves when the L1 possesses or lacks features that prime learners to acquire RRCs and NRRC.

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APPENDICES

Appendix A: Individual learner subject information

Subject	Age	Faculty	OPT score	Proficiency
Subject 1	18	Engineering	62	Intermediate
Subject 2	19	Medicine	63	
Subject 3	18	Law	63	
Subject 4	18	Law	63	
Subject 5	17	Law	64	
Subject 6	18	Law	64	
Subject 7	18	Law	65	
Subject 8	18	Medicine	66	
Subject 9	19	Engineering	66	
Subject 10	18	Medicine	67	
Subject 11	18	Engineering	68	
Subject 12	18	Engineering	68	
Subject 13	18	Engineering	68	
Subject 14	18	Engineering	68	
Subject 15	19	Law	68	
Subject 16	18	Education	68	
Subject 17	18	Medicine	70	
Subject 18	18	Engineering	70	
Subject 19	18	Medicine	71	
Subject 20	19	Law	71	
Subject 21	20	Arts	75	Advanced
Subject 22	19	Arts	76	
Subject 23	18	Medicine	77	
Subject 24	18	Law	77	

Subject 25	18	Law	77	
Subject 26	18	Law	78	
Subject 27	18	Law	78	
Subject 28	18	Law	78	
Subject 29	18	Law	79	
Subject 30	19	Medicine	80	
Subject 31	18	Medicine	80	
Subject 32	18	Engineering	80	
Subject 33	18	Engineering	80	
Subject 34	18	Medicine	81	
Subject 35	18	Medicine	84	
Subject 36	19	Engineering	86	
Subject 37	18	Engineering	86	
Subject 38	18	Engineering	87	
Subject 39	19	Arts	89	
Subject 40	20	Arts	89	

Appendix B: Individual native speaker subject information

Subject	Age	OPT Score
Subject 1	22	92
Subject 2	24	96
Subject 3	26	97
Subject 4	28	98
Subject 5	31	98

Appendix C: Sentence interpretation task

Task 1: Sentence Interpretation

Instructions: Read the given sentences and rate if the statements given under each sentence can be inferred from the sentence. If they can be inferred from the sentence, mark ✓. If they cannot be inferred from the sentence, mark ✘. You have 45 minutes to complete this task.

Example

0. If I had paid attention in class, I would have passed the exam.

_____ I did not pass the exam.

_____ I paid attention in class.

If you think the first statement can be inferred from the given sentence, put ✓ in the space provided.

_____✓____ I did not pass the exam.

If you think the second statement cannot be inferred from the given sentence, put ✘ in the space provided.

_____✘____ I paid attention in class.

For each sentence, both statements could be all correct or all incorrect, or only one of the statements is correct.

0. If I had paid attention in class, I would have passed the exam.

_____✓____ I did not pass the exam.

_____✓____ I did not pay attention in class.

0. If I had paid attention in class, I would have passed the exam.

_____✘____ I passed the exam.

_____✘____ I paied attention in class.

0. If I had paid attention in class, I would have passed the exam.

_____✓____ I did not pass the exam.

_____✘____ I paid attention in class.

Warm up:

i. He has no one to blame but himself.

_____ He is at fault.

_____ He should not blame anyone else.

ii. Not unlike raising a child, having a pet is a huge responsibility.

_____ There is no similarity between raising a child and having a pet.

_____ Both child rearing and pet keeping are a huge responsibility.

_____

1. The dog which is sleeping is mine.

_____ I have at least one dog.

_____ Some other dogs are also sleeping.

2. I really like the plant that grows by your window.

_____ The other plants do not grow by your window.

_____ This plant grows by your window.

3. The exporter I contacted told me that the products would arrive in two weeks.

_____ I also contacted some other exporters.

_____ I contacted this exporter.

4. Pat disliked the ending of the movie, which most reviewers praised.

_____ There was also another ending, and most reviewers hated it.

_____ Pat disliked most reviewers.

5. The bakery which you talked about was just shut down.

_____ You did not talk about other bakeries.

_____ Your bakery was just shut down.

6. The villagers cut the tree that an evil spirit lived inside.

_____ There were probably some other trees with an evil spirit as well.

_____ The villagers did not cut this tree.

7. The factory the government closed hired illegal employees.

_____ The government also closed some other factories.

_____ The government closed this factory.

8. The band had to fire the drummer, who(m) the police found using drugs last week.

_____ This drummer was the only drummer in the band.

_____ The police found the band using drugs after the concert.

9. The woman who(m) you used to be in love with just got married to a billionaire.

_____ You were also in love with other women.

_____ You were not in love with this woman.

10. This morning Jim visited the school that Amy and he went to.

_____ There were also some other schools that Amy and Jim went to.

_____ Amy and Jim did not go to this school.

11. The shareholders do not like the product you manufacture.

_____ You do not manufacture the other products.

_____ You manufacture this product.

12. The actress, who(m) you might not have heard of, is a Youtube celebrity.

_____ It is possible that you might not have heard of some other actresses as well.

_____ You must have heard of the Youtube celebrity.

13. I just found the supermarket which your sister worked at.

_____ If there were other supermarkets, your sister did not work there.

_____ Your sister worked at this supermarket.

14. The rose that came from your garden was so beautiful.

_____ Apart from this rose, some other roses also came from your garden.

_____ Your garden was so beautiful.

15. I do not think you fully understand the article she wrote.

_____ There might be some other articles, but she did not write them.

_____ I do not think she wrote the article.

16. The book, which the movie was based on, was little known before the movie came out.

_____ The movie was based on this book.

_____ Everybody knew the book even before the movie came out.

17. I know the professor who(m) you are looking for.

_____ You are also looking for the other professors.

_____ The professor is looking for you.

18. The thermometer that was wrapped in paper did not work anymore.

_____ If there were other thermometers, they were also wrapped in paper.

_____ The paper did not work anymore.

19. The information you're looking for is not available on our database.

_____ There might be other information, and you are looking for it as well.

_____ This information is what you are looking for.

20. The institute is forced to end the project, which John has been working on since he first worked here.

_____ What John has been working on since he first worked here was this project.

_____ The project is ended.

21. The postman who often came here just left his job.

_____ The other postmen also came here often.

_____ This postman came to leave his job.

22. Apple just released the application that allows its users to upload data from anywhere.

_____ The other applications do not allow their users to upload data from anywhere.

_____ Apple uploads data from anywhere.

23. The grandmother you borrowed money from just called an hour ago.

_____ An hour ago, this grandmother just called.

_____ You borrowed money from this grandmother an hour ago.

24. We have been avoiding the woman, who(m) Jane is still angry at.

_____ Jane is angry at this woman.

_____ We have been avoiding Jane.

25. I just ate the cake which was in the fridge.

_____ There might be some other cake outside the fridge.

_____ This particular cake was in the fridge.

26. The theory that Sir Isaac Newton proposed marked the beginning of science.

_____ If there were other theories, Sir Isaac Newton did not propose them.

_____ Sir Isaac Newton proposed the beginning of science

27. The government continued the policy people protested against anyway.

_____ People also protested against the other policies.

_____ People protested against this policy.

28. The dictionary, which has more than 300,000 entries, is the most expensive of its kind.

_____ This dictionary is probably not the only one with more than 300,000 entries.

_____ This dictionary contains more than 300,000 entries.

29. A policeman fined the driver who was driving too fast.

_____ The other drivers were not driving too fast.

_____ This driver was fined for driving too fast.

30. The hamster that I kept was called Tyler.

_____ I also kept some other hamsters.

_____ I kept this hamster.

31. A dark forest with dangerous animals lay in the direction Kim was heading for.

_____ There were other directions, but Kim was not heading those ways.

_____ Kim was heading for this direction.

32. The suspect, who was 26, drove a red car towards the expressway.

_____ What this suspect drove was a red car.

_____ This 26-year-old person was a suspect.

33. The fridge which Jane bought did not fit the space.

_____ Jane also bought the other fridges.

_____ This fridge was bought by Jane.

34. My poodle broke the vase that I made.

_____ If there were other vases, I also made them.

_____ I made this vase.

35. The earthquake caused the tsunami, which is expected to hit the shore in two days.

_____ If there are some other tsunamis, they might hit the shore in two days as well.

_____ The earthquake is expected to hit the shore in two days.

36. The thief who(m) the girl saw ran out the back door.

_____ If there were other thieves, the girl did not see them.

_____ The girl ran out the back door.

37. Rosa clearly did not like the dress that her daughter was wearing.

_____ Her daughter might have some other dresses, but she was not wearing them.

_____ Rosa did not like her daughter.

38. People seemed to hate the minister, who had no previous experience in politics.

_____ People seemed to hate this inexperienced minister.

_____ People also hated politics.

39. The storm destroyed the park which the city people loved.

_____ The city people also loved the other parks.

_____ This park was destroyed by the storm.

40. The plan that the government intended to carry out was criticized.

_____ The government did not intend to carry out other plans.

_____ People praised this plan.

41. The band, which Thai people love so much, started out with only three members.

_____ Thai people love this band so much.

_____ This band loves Thai people so much.

42. She liked the teacher who(m) all of her friends hated.

_____ The other teachers were not hated by all of her friends.

_____ Not all of her friends hated this teacher.

43. The man that Danielle went out with called her again.

_____ Danielle did not go out with other men.

_____ This man called Danielle

44. The burglar, who(m) no one managed to catch, was arrested this morning.

_____ There was another burglar.

_____ This morning, no one could catch the burglar.

Appendix D: Grammaticality judgment task

Task 2: Grammaticality judgment test with sentence correction

Instructions: Read each sentence. Then, put either A, B, C, or D in the blank in front of the sentence to rate if it is grammatical or not.

A = Definitely correct

B = Probably correct

C = Probably incorrect

D = Definitely incorrect

Example 1

_____a. I love ice cream.

If you think this sentence is definitely correct, put the letter A in the blank in front of the sentence.

___A___a. I love ice cream.

If you think this sentence is probably correct, put the letter B in the blank in front of the sentence.

___B___a. I love ice cream.

If you think the sentence is incorrect (i.e. if you put C or D in the blank), please also provide a correction. Also note that you will not be tested on errors related to spelling, tense, and punctuation

Example 2

_____b. They does not know where the toilet is.

If you think this sentence is probably incorrect, put the letter C in the blank in front of the sentence as well as cross out the incorrect part and provide a correction over it.

do

___C___b. They ~~does~~ not know where the toilet is.

If you think this sentence is definitely incorrect, put the letter D in the blank in front of the sentence as well as cross out the incorrect part and provide a correction over it.

do

___D___b. They ~~does~~ not know where the toilet is.

You have 60 minutes to complete the task.

DO NOT return to previous questions to change answers.

Warm up:

_____ i. Chulalongkorn University was founded in 1917.

_____ ii. I didn't bought the vase.

_____ iii. The grass always looks greener on the other side.

_____

_____ 1. The document which was on the table was given to Mr. Evans.

_____ 2. I like the cake that has chocolate fudge and chocolate chips on top.

_____ 3. The house Henry got from his grandmother was too big for him to live there alone.

_____ 4. I didn't see the bag which you made it.

_____ 5. The tart which that this bakery is famous for is actually very easy to make.

_____ 6. Einstein came up with the theory, which we are making use of at the moment.

_____ 7. The doll, that sat on the shelf, belonged to his sister.

_____ 8. The court also supported the law, will force every motorist to wear a helmet.

_____ 9. The contract, which Jimmy signed it, made him lose his house.

_____ 10. Jennifer Aniston popularized the hairstyle, which that every girl in the 90's tried to imitate.

_____ 11. The book which you are looking for has already been borrowed.

_____ 12. I won't sleep in the bed that she slept in.

_____ 13. The seed received no light grew very little compared to the one in the sun.

_____ 14. He asked me not to use the pan which it was in the cupboard.

_____ 15. The explosive which that Nobel invented changed the world forever.

_____ 16. HBO is going to air the scene, which nobody has ever seen before.

_____ 17. The restaurant, that Ricky and I just went to last Friday, also serves grilled fish.

_____ 18. The island's main attractions include the waterfall, every visitor has to take a photo of.

_____ 19. The book, which it will hit the shelf this Monday, contains all the details about the new star.

_____ 20. They missed the event, which that would not be held again in the next four years.

_____ 21. The package which you took also included breakfast.

_____ 22. You've picked the t-shirt that I hate the most.

_____ 23. The bus he got on was almost empty.

_____ 24. The military successfully captured the killer who(m) people were so afraid of him.

_____ 25. The flag which that was replaced by the current one was last flown in 1936.

_____ 26. Most people on higher floors should be able to feel the earthquake, which measured over 5 on the Richter scale.

_____ 27. The element, that scientists can create in a lab, is highly unstable.

_____ 28. He was forced to drop the gun, he held in his right hand the whole time.

_____ 29. The board, which you can also put your ads on it, is right in front of the canteen.

_____ 30. Several experts have been invited to discuss the topic, which that Peter was really keen on.

_____ 31. The committee also chose the book which won the popular vote.

_____ 32. The street that you will have to take should be on your left.

_____ 33. Tom lost the watch his grandmother gave him.

_____ 34. The ticket which you have paid for it can be collected at the entrance.

_____ 35. You must report to the police the noise which that you have been putting up with.

_____ 36. The church, which was built in the 14th century, once served to protect refugees.

_____ 37. People in the village believe in the legend, that has been passed on from generation to generation.

_____ 38. The parasite, Dr. Henry found accidentally, is revealed to be harmless.

_____ 39. The flood has severely damaged the temple, which the villagers built it just 2 years ago.

_____ 40. The sauce, which that John doesn't dip his chicken nuggets in, is actually neither hot nor spicy.

_____ 41. Please make sure that you clean the slot which you put discs in.

_____ 42. The germ that lives in your ear can cause an infection.

_____ 43. Ken bought the shirt went well with his pants.

_____ 44. The food which he cooked it was so tasty we all asked for more.

_____ 45. You should have bought the shirt which that we saw in the first shop.

_____ 46. The house, which he lived in when he was a child, has been replaced by a small church.

_____ 47. A group of entertainment companies decided to sue the website, that millions of users logged into each month.

_____ 48. The star, was mentioned in many ancient inscriptions, is visible in a really dark night.

_____ 49. Several people go to the zoo to see the panda, which it was given to Thailand by the Chinese government.

_____ 50. The book, which that we will use only for the first half of this course, is available at the library.

_____ 51. People will finally like the song which the station plays again and again.

_____ 52. The song that you're listening to is sung by Rebecca Ferguson.

_____ 53. Abortion is the topic they are arguing about.

_____ 54. The book which it has no cover is separated from the rest.

_____ 55. People around here love the shoemaker who that owns a shop on the corner of the street.

_____ 56. The expressway, which you must not take, will be on your left.

_____ 57. Many critics praised the policy, that the government proposed under the pressure of the economic crisis.

_____ 58. The test, he had spent months preparing for, was cancelled at the last minute.

_____ 59. Finally, I saw the comet, which I spent the whole night waiting for it.

_____ 60. The planet, which that is almost twice bigger that the earth, has the perfect environment for life to develop.

_____ 61. The doctor who had to be in tonight came 15 minutes late.

_____ 62. The technician failed to recover the data that was in the hard disk.

_____ 63. The tool you have alone might not be enough for the job.

_____ 64. We went back to school to visit the teacher who(m) we admired her.

_____ 65. The professor who(m) that I took psychology with just moved to another town.

_____ 66. Joey ran into the coach, who(m) he had not heard of for several years.

_____ 67. The photo, that was taken on the last day of the war, has been put up for sale.

_____ 68. They were not allowed to enter the area, strictly prohibited improper attire.

_____ 69. The comedian, who(m) Ellen has interviewed him twice, will come to the show again.

_____ 70. My father personally knows the philosopher, who that my teacher often quotes.

_____ 71. The postman who(m) all the dogs bark at does not come by on Tuesday.

_____ 72. I want to play the game that you told me about last week.

_____ 73. The stamp comes with the cereal box can be used as a discount coupon.

_____ 74. The policeman had no choice but to shoot the thief who he was going to hurt a little girl.

_____ 75. The patient who(m) that the vaccine was given was very young.

_____ 76. The elderly man ran out to hug the girl, who(m) he recognized right away.

_____ 77. The answer, that nobody could think of at the moment, was actually right under their nose.

_____ 78. A mad man killed the victim, many Thai people gave donation to.

_____ 79. The boy, who he has already performed 500 operations, started curing people when he was 7.

_____ 80. The gangsters attacked the beggar, who that was sitting on the floor in front of the store.

_____ 81. The professor who(m) you mentioned is going to give a lecture at the conference.

_____ 82. That artist painted the picture that I hung in my room.

_____ 83. The topic I wrote on was considered too dangerous to be published.

_____ 84. Tom nearly punched the neighbor who(m) he was having a serious argument with her.

_____ 85. The sailor who that was left on that island did not know that the war was over.

_____ 86. The police finally found the murderer, who tried to escape to Cambodia.

_____ 87. The card, that he drew slowly, turned out to be the worst– Death.

_____ 88. We all went to buy the novel, Dan wrote a year before he died.

_____ 89. The politician, who(m) my mother voted for him, just resigned from his party.

_____ 90. Sarah hopes to meet the producer, who(m) that she has always wanted to work with.

_____ 91. I know the mechanic who lives on the fifth street.

_____ 92. The bomb that the terrorists threw did not go off.

_____ 93. Still angry at Natalie, Nick refused to touch the cake she baked him.

_____ 94. The girl who(m) you fell in love with her just got married.

_____ 95. Mandy thought she knew the man who(m) that Judy was talking to.

_____ 96. The doctor, who specializes in brain diseases, had published several articles.

_____ 97. In 1982, they discovered the island, that was the home of thousands of new species.

_____ 98. The dress, you have worn only once, costs more than my salary.

_____ 99. We met the golfer, who(m) many people criticized him for his affairs with several women.

_____ 100. The physicist, who(m) that we were invited to have a dinner with, just won a Nobel Prize.

_____ 101. I just don't like the contestant who(m) you voted for.

_____ 102. The picture that is hung on the wall was taken when I went to Japan.

_____ 103. Dr. Franco discovered the dinosaur linked crocodiles with birds.

_____ 104. The doctor who(m) you saw her thought there was nothing to worry about.

_____ 105. A TV show just interviewed the activist who(m) that we met in Hong Kong.

_____ 106. The author, who(m) you used to share a room with, was just given an award.

_____ 107. They finally reached the temple, that only a few people could get into.

_____ 108. The river, runs through every province in the region, plays an important role in the people's lives.

_____ 109. I want you to see the therapist, who he will give you tips on how to cope with stress.

_____ 110. The hero, who(m) that the kids love so much, can be said to be a little too aggressive.

_____ 111. The critics seem to like the chef who(m) you hated so much.

_____ 112. The leaf that these bugs feed on will turn brown at the edge.

_____ 113. The city is repairing the street we used to walk along every evening.

_____ 114. The teacher who he used to teach Spanish is currently teaching English.

_____ 115. Jenny decided to throw away the box which that was in the basement.

_____ 116. The president, who(m) the media are attacking severely, decided to resign.

_____ 117. The conditions of that period forced them to invent the symbol, that we can still find nowadays.

_____ 118. The teenager, everybody used to laugh at, has become really successful and famous.

_____ 119. Harry travelled across the country to see the actress, who(m) he was really fond of her.

_____ 120. The cook, who that is famous for his soup, will open a cooking school.

Appendix E: Item-Objective Congruence (IOC) scores

Task 1

Item no.	Expert 1	Expert 2	Expert 3	Average
1	1	1	1	1.00
2	0	1	1	0.67
3	1	0	1	0.67
4	1	1	1	1.00
5	1	1	1	1.00
6	1	1	1	1.00
7	1	1	1	1.00
8	1	1	1	1.00
9	1	1	1	1.00
10	1	1	1	1.00
11	0	1	1	0.67
12	1	1	1	1.00
13	1	1	1	1.00
14	1	1	1	1.00
15	1	1	1	1.00
16	1	1	1	1.00
17	0	1	1	0.67
18	1	1	1	1.00
19	1	0	1	0.67
20	1	1	1	1.00
21	0	1	1	0.67
22	1	1	1	1.00
23	1	1	1	1.00

24	0	1	1	0.67
25	1	1	1	1.00
26	1	1	1	1.00
27	1	1	1	1.00
28	1	1	1	1.00
29	0	1	1	0.67
30	1	1	1	1.00
31	1	1	1	1.00
32	1	1	1	1.00
33	1	1	1	1.00
34	1	1	1	1.00
35	1	1	1	1.00
36	0	1	1	0.67
37	0	1	1	0.67
38	1	1	1	1.00
39	1	1	1	1.00
40	1	1	0	0.67
41	1	1	1	1.00
42	1	1	1	1.00
43	1	1	1	1.00
44	1	1	1	1.00
Average				0.917

Task 2

Item no.	Expert 1	Expert 2	Expert 3	Average
1	1	1	1	1.00
2	1	1	1	1.00
3	1	1	1	1.00
4	1	1	1	1.00
5	1	0	1	0.67
6	1	1	1	1.00
7	0	1	1	0.67
8	1	1	1	1.00
9	0	1	1	0.67
10	1	1	1	1.00
11	1	1	1	1.00
12	1	1	1	1.00
13	1	1	1	1.00
14	1	1	1	1.00
15	1	0	1	0.67
16	0	1	1	0.67
17	1	1	1	1.00
18	0	1	1	0.67
19	1	1	1	1.00
20	1	1	1	1.00
21	1	1	1	1.00
22	1	1	1	1.00
23	1	1	1	1.00
24	1	1	1	1.00

25	1	0	1	0.67
26	1	1	1	1.00
27	1	1	1	1.00
28	0	1	1	0.67
29	1	1	1	1.00
30	1	1	1	1.00
31	1	1	1	1.00
32	1	1	1	1.00
33	1	1	1	1.00
34	1	1	1	1.00
35	1	0	1	0.67
36	1	1	1	1.00
37	1	1	1	1.00
38	0	1	1	0.67
39	1	1	1	1.00
40	1	1	1	1.00
41	1	1	1	1.00
42	1	1	1	1.00
43	1	1	1	1.00
44	1	1	1	1.00
45	1	0	1	0.67
46	1	1	1	1.00
47	1	1	1	1.00
48	1	1	1	1.00
49	1	1	1	1.00
50	1	1	1	1.00
51	1	1	1	1.00

52	1	1	1	1.00
53	1	1	1	1.00
54	1	1	1	1.00
55	0	0	1	0.33
56	0	1	1	0.67
57	0	1	1	0.67
58	0	1	1	0.67
59	1	1	1	1.00
60	1	1	1	1.00
61	1	1	1	1.00
62	1	1	1	1.00
63	1	1	1	1.00
64	1	1	1	1.00
65	1	0	1	0.67
66	0	1	1	0.67
67	0	1	1	0.67
68	1	1	1	1.00
69	1	1	1	1.00
70	0	1	1	0.67
71	1	1	1	1.00
72	1	1	1	1.00
73	1	1	1	1.00
74	1	1	1	1.00
75	1	0	1	0.67
76	0	1	1	0.67
77	1	1	1	1.00
78	1	1	1	1.00

79	0	1	1	0.67
80	1	1	1	1.00
81	1	1	1	1.00
82	1	1	1	1.00
83	1	1	1	1.00
84	1	1	1	1.00
85	1	0	1	0.67
86	0	1	1	0.67
87	1	1	1	1.00
88	0	1	1	0.67
89	1	1	1	1.00
90	1	1	1	1.00
91	1	1	1	1.00
92	1	1	1	1.00
93	1	1	1	1.00
94	1	1	1	1.00
95	1	0	1	0.67
96	0	1	1	0.67
97	1	1	1	1.00
98	0	1	1	0.67
99	1	1	1	1.00
100	1	1	1	1.00
101	1	1	1	1.00
102	1	1	1	1.00
103	1	1	1	1.00
104	1	1	1	1.00
105	1	0	1	0.67

106	0	1	1	0.67
107	1	1	1	1.00
108	1	1	1	1.00
109	1	1	1	1.00
110	1	1	1	1.00
111	1	1	1	1.00
112	1	1	1	1.00
113	1	1	1	1.00
114	1	1	1	1.00
115	1	0	1	0.67
116	1	1	1	1.00
117	1	1	1	1.00
118	0	1	1	0.67
119	1	1	1	1.00
120	0	1	1	0.67
Average				0.906

VITA

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