การสำรวจการลำดับเหตุการณ์ในโครงสร้างวิเศษณานุประโยคของผู้เรียนไทย
ที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ
AN INVESTIGATION OF THAI EFL LEARNERS' ICONICITY OF SEQUENCE
IN TEMPORAL ADVERBIAL CLAUSES

อภินันท์ วงศ์กิตติพร[1] และ ปิยนุช แก้วกสิ[2*]

Abhinan Wongkittiporn[1] and Piyanut Kaewkasi[2*]

[1, 2]มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตสุราษฎร์ธานี 31 หมู่ 6 ต.มะขามเตี้ย อ.เมือง จ.สุราษฎร์ธานี 84000 ประเทศไทย

[1, 2]Prince of Songkla University, Surat Thai Campus, 31 Moo 6, Makham Tia Sub–district, Mueang District,

Surat Thani Province 84000, Thailand

*Corresponding author E–mail: piyanut.k@psu.ac.th

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อสำรวจสมรรถนะทางวัจนปฏิบัติศาสตร์ด้านการใช้โครงสร้างวิเศษณานุประโยค
ที่เกี่ยวกับการลำดับเหตุการณ์ของผู้เรียนไทยที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ กลุ่มตัวอย่างคือนักศึกษา
ชั้นปีที่หนึ่ง มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตสุราษฎร์ธานี ที่ลงทะเบียนเรียนรายวิชาภาษาอังกฤษพื้นฐาน
จำนวน 171 คน ซึ่งได้มาด้วยวิธีการสุ่มตัวอย่างแบบกลุ่ม เครื่องมือที่ใช้ในการวิจัยคือแบบทดสอบการตัดสิน
เกี่ยวกับไวยากรณ์ การวิเคราะห์ข้อมูลสถิติเชิงอนุมานโดยการหาค่าสัมประสิทธิ์สัมพัทธ์ทางสถิติระหว่างตัวแปร
ผลการศึกษาแสดงให้เห็นว่ามีความสัมพันธ์อย่างไม่มีนัยสำคัญทางสถิติระหว่างสมรรถนะการจัดเรียงลำดับเหตุการณ์
โครงสร้างข้อมูลวิเศษณานุประโยคที่เกี่ยวกับเวลาและนักศึกษาระดับปริญญาตรีชั้นปีที่หนึ่งที่มีทักษะภาษาอังกฤษใน
ระดับต่ำ ผลการศึกษาแสดงให้เห็นว่ากลุ่มตัวอย่างมีทักษะทางภาษาอังกฤษระดับที่ค่อนข้างต่ำ ได้ระดับคะแนนรายวิชา
ภาษาอังกฤษพื้นฐานค่าเฉลี่ยที่ 55–65 คะแนน จึงเป็นสาเหตุที่ทำให้ผู้เรียนไทยซึ่งเรียนภาษาอังกฤษเป็นภาษาต่าง
ประเทศขาดสมรรถนะในการจัดเรียงข้อมูลตามหลักการจัดเรียงลำดับเหตุการณ์ได้อย่างเหมาะสม

คำสำคัญ: ผู้เรียนไทยที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศ, สมรรถนะทางวัจนปฏิบัติศาสตร์, หลักการลำดับ
เวลาในโครงสร้างวิเศษณานุประโยค

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[1] อาจารย์ ดร. สาขาภาษาอังกฤษเพื่อการสื่อสารทางธุรกิจ คณะศิลปศาสตร์และวิทยาการจัดการ
[1] อาจารย์ สาขาภาษาอังกฤษเพื่อการสื่อสารทางธุรกิจ คณะศิลปศาสตร์และวิทยาการจัดการ

ABSTRACT

The study investigated Thai EFL learners' pragmatic competence concerning iconicity of sequence and temporal adverbial clauses. The participants in this study were 171 freshmen from Prince of Songkla University, Surat Thani Campus. They were derived to the study by a stratified sampling method. The research instrument used in this study was a Grammaticality Judgment Test (GJT). The data analysis followed an inferential statistical analysis of Pearson Correlation. The results revealed that there was no statistically significant relationship between the participants' use of iconicity of sequence and temporal adverbial clauses. Due to their lower proficiency levels of English, the empirical evidence to support the results was their scores of fundamental English subjects reported at only 55 – 56 percent. This was a major cause of their weak linguistic competence in structuring information and using temporal adverbial clauses in English appropriately.

Background of the Study

Temporal adverbial clauses in this study referred to part of complex sentences in English. They were classified as adjuncts, refering to supplement information (Radford, 2009; 2023). Omitting it did not impact the grammaticality of the sentence. They were dependent clauses in English, so standing alone, as in *when Amy cooked dinner* results in ungrammaticality of the sentence (Murphy, 2018; Swan, 2015). The structural variants of temporal adjuncts were various, such as *finite temporal adverbial clauses*, *non-finite temporal adverbial clauses*

and *verbless adverbial clauses* (Murphy, 2018; Swan, 2015). This study focused on finite temporal adverbial clauses as in (1) where its syntactic representation is illustrated in Figure 1.

(1) *After Jack and Amy finished their dinner*, they watched the movie.

The *italic* in (1) was a finite adverbial clause in English. The tense was spelt out in the main verb as in *finished,* where the inflectional morphology *–ed* indicated the past.
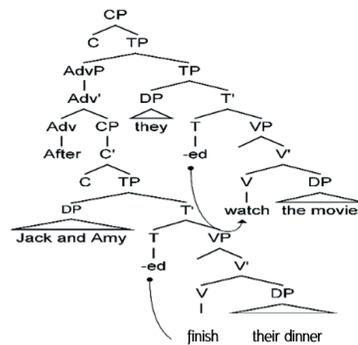

Figure 1 Syntactic Representations of Temporal Adverbial Clauses

The function of temporal adjuncts was temporal indication whether the event in dependent clauses took place before, after or at the same time as the independent clause. According to *X*-bar theory, a clause had the head and its complement (Radford, 2023). The adverbial phrase (AdvP), which was filled with the lexical item *after,* was merged with tense projection (TP) *Tom and Amy finished their dinner* as its complement. The whole finite adverbial clause was analyzed as a *temporal adjunct.* Omitting them did not affect the grammaticality of the sentence (Radford, 2023; Robert, 2023; Wongkittiporn, 2025). It was special for temporal adjuncts to be placed in different positions in the sentence. This was considered as variants of structuring information in English.

Although temporal adverbial clauses were syntactically adjuncts, they were semantically important according to *semantic principle of compositionality,*

referring to the ordering of words, phrases, clauses and sentences (Jaszczolt, 2023; Kreidler, 2014). For example, *Jack loves Mary* was different from *Mary loves Jack.* The semantic denotations of temporal adverbial clauses indicated *pre-while-post* events reflected the truth in the real-word event. Ordering them based on sequential order reduced support our cognitive process in understanding and interpretating information (Wilder, Gärtner & Bierwisch, 2018), known as *least effort of requirement* (Radford, 2009).

(2) *After Jack and Amy finished their dinner*, they watched the movie.

(3) *Jack and Amy* watched the movie *after they finished their dinner.*

Examples (2)–(3) had the same truth value. Nonetheless, example (2) differed from example (3) in terms of *iconicity of sequence,* sometimes known as *iconicity*

of sentence. Structuring information as in (3) violates iconicity of sequence. Although both sentences were grammatical and acceptable by native speakers, the speakers did not support the hearers to understand the information as quickly as possible. Why do the speakers should follow this rule? Reporting information in sequential order is important in official context, such as in court, hospitals, banking and in emergency situations. Reporting information back and forth in the court could be interpreted unreliable responses, leading to losing a lawsuit. Moreover, when seeing the doctor, the patients had limited time to explain their symptoms. Explaining information back and forth could affect the doctor's diagnosis and medication prescriptions. Thus, iconicity of sequence was viewed as EFL learners' pragmatic competence to upgrade their communication skills.

Iconicity of sequence was the linguistic principle of information structures (Givon, 1985). It was a universal principle to study the sequential order of information with complex sentences. For example, Givon (1985) noted that using adverbial clauses in the initial positions of the sentence was common when starting a new paragraph. The initial position of adverbial clauses was due to the organization of the transition between paragraphs. This seemed true with concessive adverbial clauses, such as argumentative essays where the concessive adverbial connector *while* was pointed out to signal the writers' contradiction. Unlike concessive adverbial clauses, whether or not temporal adverbial clauses should be ordered sequentially had never been mentioned before. Non-iconic clauses would lead to the difficulty of hearers' informational reception, leading to miscommunication or understanding. Although iconicity of sequence was not the main parameter in English, having this principle installed in Thai EFL learners' mental representation was necessary for them to combine information more effectively. In fact, many syntactic structures in English followed this principle, such as (4)–(6).

(4) I decided *to eat KFC after class.* (+Fixed Collocation)

(5) I work in the morning *and exercise in the evening.* (+Fixed Collocation)

(6) I visited my grandmother *before picking up Joe at school.* (–Fixed Collocation)

Unlike the above examples, temporal adjuncts were different from these structures in that the positions of dependent clauses were not fixed. The position depended on context, situation, the speaker and the topic of speaking. In addition, different language had its own preference concerning the placement of adverbial clauses (Asrat, Mengistu, & Assefa, 2025; Lim, Hiramoto, Leimgruber & Gonzales, 2024).

One previous study showed that the speaker's age was an influential variable for the speaker to follow iconicity of sequence. Zhang, Brandt and Theakston (2015) studied temporal adverbial clauses with the variable of age. The participants in the study were monolingual native speakers of British English. They were asked to produce temporal adverbial clauses using a sentence completion task. The participants were divided into different age groups, such as four-year-olds, eight-year-olds and adults. The results showed that only the adult group had a statistically significatcant relationship between their temporal adverbial clauses and iconicity of sequence where the p-value was reported at 0.01. The results of their study aligned with the principles of cognitive linguistics, indicating that the iconicity of sequence increased as speakers grow older.

When the placement of adverbial clauses was non-obligatory, different variables could affect how temporal adverbial clauses were combined. It was thought that the variable of language proficiency could be added to investigate further. Wongkittiporn (2024) examined the iconicity of sequence with Thai EFL learners whose level of English proficiency was A2 according to Oxford Placement Test. They were asked to write a descriptive

paragraph about a place. The results showed there was a statistically significant relationship between iconicity of sequence and Thai EFL learners whose level of English proficiency was A2. The p-value was 0.01. This was because the students with an A2 level could understand sentences to communicate in routine tasks. To the best of the authors' knowledge, no one had investigated this issue in relation to Thai EFL learners with A1 level of CEFR before. This study contributes something new to the field by supporting Thai EFL learners with A1 level of CEFR to master their English skills. However, Cahyono, Mukminatien and Amrina (2016) found that the low proficiency EFL learners showed the problems of using complex sentence in English.

Cahyono et al. (2016) claim might be true in some cases. Complex sentences, such as *adjective clauses* and *noun clause complements* were classified into the branch of sentence structure in English, but information structuring was different. It is interesting to study iconicity of sequence and temporal adverbial clauses with the variable of English language proficiency.

Iconicity of sequence in temporal adverbial clauses in this study was tested with Thai EFL learners. Thai EFL learners are classified as learners of English as a Foreign Language (EFL) (Sha'ar & Boonsuk, 2021). Learning English in Thailand was not based on communication, but it was focused on reading, vocabulary and grammar as discrete skills. As such, the production process, especially in writing and speaking, was limited among Thai EFL learners.

Most previous studies paid attention to the use of adverbial clauses among EFL learners in Asian countries, such as Singapore, Hong Kong, Indonesia and Turkey. Leuckert (2018) investigated the production of adverbial clauses among native English speakers, English as a Second Language (ESL) learners and EFL learners. The data of ESL learners came from International Corpus of English (ICE)–Hong Kong and ICE Singapore. The data of native English speakers came from ICE–British. The data of EFL learners came from the International Corpus Network of Asian Learners of English (ICNALE), such as (7).

(7) Because I knew it, I have hated smoker *since I have a child.* (Leuckert, 2018, p. 247)

Example (7) showed EFL learners' use of a temporal adjunct. The corpus of ICNALE showed that it was common for temporal adverbial clauses to be used in the final position at 59.15 percent. The results of the temporal adverbial heads among Native English (NE) speakers, ESL and EFL learners were 48.94 percent, 49.37 and 83.33 percent, respectively. Although the percentage of the temporal adverbial heads *while* between NE speakers and ESL learners were similar, the percentage of the adverbial head *while* as produced by EFL learners was two times higher. This was interpreted that EFL learners seemed to have problems deciding when they should use temporal adverbial clauses.

Antika, Wahyuni, and Melvina (2020) studied temporal adverbial clauses, such as *before, after, since* and *when*, whereas the adverbial clause of reason included the adverbial connector *because.* The data collection was derived from 30 third–year students from an Indonesian university. The participants were asked to make a grammatical judgement about the tense of temporal adverbial clauses. The results showed that the participants had some problems in using the tense in temporal adverbial clauses. For example, the sentence *the next day, while we were sleeping, there is a window's car* was judged to be a correct sentence. The study concluded that practicing the use of tense in temporal adverbial clauses were important for undergraduate university students.

Yilmaz and Dikilitas (2017) studied Turkish undergraduate students' production of adverbial clauses in argumentative essays, which were produced by B2 English language learners. The results showed that

they produced the adverbials with different semantic denotations. The highest percentage occurred with the adverbials of degree followed by temporal adverbials. This study implied that temporal adverbial clauses were the structures that were frequently used by EFL learners whose English level was B2. Most previous studies focused on types of adverbial clauses that EFL learners preferred to use via a qualitative study.

As highlighted by Franz and Teo (2018), the average English ability among Thai EFL learners are A2, which could be lower in some Thai universities. Instructing them to write a paragraph like other research studies (Leuckert, 2018; Antika, Wahyuni & Melvina, 2020; Yilmaz & Dikilitas, 2017) was impractical, leading to the unreliability of the results in this study. When Thai EFL learners entered universities, they were encouraged to write in the form of sentences, paragraphs and essays. The ability to combine information in English was important for them to show they understand what was instructed by their lecturers. Upgrading the skills of structuring information among Thai EFL learners is urgent as it is an important skill at university level. The research methodology in the current study was redesigned to fit with a group of lower proficient learners. With the results of the study, it is expected that English language teachers would support Thai EFL learners, entering the university for the first year to form sentences in English correctly and systematically. This leads to the objective of the study as follows:

Objective of the Study

To investigate Thai EFL learners' pragmatic competence concerning iconicity of sequence and temporal adverbial clauses in English.

Statement of Hypothesis

There is a statistically significant relationship between the first-year students whose levels of their English proficiency is low and their use of iconicity of sequence in temporal adverbial clauses.

Conceptual Framework

The linguistic theory in this study is pragmatic principle concerning *iconicity of sequence*. Givon (1985) and Haspelmath (2008) referred to *iconicity of sequence* as order and time. Sequential order referred to events that happened in the real world being compliant with each other. The event happening first should be reported before a subsequent event. It was believed that the information that was linguistically expressed via iconicity of sequence supports the hearers' economy principle in processing information and the relevance of information they gained from their interlocutors.

Apart from linguistic competence, Thai EFL learners were expected to achieve at least B2 level (CEFR) for their language proficiency according to the Ministry of Higher Education in Thailand. Whilst Franz and Teo (2018) mentioned that A2 level, basic users, was a normal English level among Thai EFL learners, Thai EFL learners who had acquired the B2 level should be able to use complex structures to communicate complex stories, such as business, culture and politics. Not only should the Thai EFL learners be able to have these complex topics in their conversations, but they should also have the ability to express these stories clearly, relevantly and objectively. Having the ability to express the sequentially was equally important. This study examines first year EFL learners who had just entered the public university in Thailand to assess their pragmatic principle concerning *iconicity of sequence*. In addition to evaluating the Thai EFL learners' existing linguistic competence, further discussion about the ways to advance their English ability is written in the section of pragmatic pedagogical implications.

Iconicity of sequence was a linguistic principle that was applied to the structures that were combined

sequentially. Despite it not being the main parameter (such as *non–null–subject parameter*) (Radford, 2023), it was thought that lexical expressions of time in English such as *yesterday* and *tomorrow,* are temporal adjuncts. Omitting them did not affect the grammaticality of the sentence. Due to this effect, there was no exact system or rule for the placement of temporal adverbs and temporal adverbial clauses in English. Writers usually acquired this knowledge based on their own writing and reading experience.

Likewise, temporal adverbial clauses were dependent clauses in English. They were *dependent clauses*, lacking sentential completion if standing along (Murphy, 2018). Temporal adverbial clauses join events together via the adverbial heads, such as *after*, *before*, *when*, *while* and *until*. For example, *I was a bureaucratic employee until I retired*. The clause *until I retired* was a temporal adverbial clause having an end point. As

such, it was placed at the final position of the sentence. In addition, the study of temporal adjuncts would allow the researchers to examine the Thai EFL learners' other linguistic competence, referring to the ability to use language. This included *cooperative principles* in pragmatics. Grice (1975) referred to the maxim of relevance as the relatedness of information as sent to the interlocutors. Therefore, temporal adverbial clauses were considered as appropriate syntactic structures to seek iconicity of sequence and maxim of relevance among Thai EFL learners' pragmatic competence.

Methodology

In order to accept or reject the hypothesis in this study, a quantitative study is the method to follow. This section explains the population of the study, sample, data collection, instruments, instrument validation and data analysis.

Table 1 Research Procedure

Research Question	Sample	Instrument	Instrument Validation	Data Analysis
Is there a statistically significant relationship between the first–year students whose levels of their English proficiency is low and their use of iconicity of sequence in temporal adverbial clauses?	Yamane (1973) 171 First–Year Students from PSU Surat Thani	Grammatical Judgement Task (GJT)	IOC via Three Experts from Different Universities	Pearson Correlation via SPSS Version 29

Ethical Consideration

This research study was ethically approved by the Ethics Office, Prince of Songkla University. This study followed ethical consideration concerning proper treatment of the participants of the study. Firstly, the researchers had read ethics textbooks to ensure they were aware of how to treat the process of data collection and how to treat the participants appropriately (Cooper, 2018). Secondly, the researchers had participated in ethical practices for researchers which was a nationally organized training course that lasted for 12 hours.

Accordingly, the participants in this study were treated appropriately and ethically correctly to reach international standards. The participants voluntarily participated in the study. It was possible for them to withdraw from the study anytime without consequences. Before the data were collected, the participants were informed of the objectives and the benefits that they would achieve by participating in this research study.

Population and Sample of the Study

The population in this study was freshmen at Prince of Songkla University, Surat Thani Campus. There

were three faculties on this campus including Liberal Arts and Management Sciences (LAMS), Faculty of Science and Industrial Technology (SIT) and Faculty of Innovative Agriculture and Fisheries (IAF).

The sampling in this study followed *cluster sampling method* where the sample came from each individual group. This technique was commonly used in marketing research (Nelson, 2014). Ideally, the population in each cluster should be different, but there should be similarity between clusters. An individual cluster was a small-scale representation of the whole population (Nelson, 2014).

IT, business management and fisheries EFL learners were different groups of learners. Background knowledge, characteristics and interests were totally different. They shared the same weak English skills. Each faculty has its own criteria to admit the first-year students. Everyone was required to enroll in the subject called *Everyday English Reading and Writing.* (939-009). This subject was selected as it was a compulsory fundamental English subject in general education (GenEd) that every first-year student enrolling at Prince of Songkla University (PSU), Surat Thani Campus must study. They studied from the same coursebook, containing the same subjects of reading, writing, grammar and sentence structures. The coursebook included a unit on temporal adverbial clauses that every first-year student was taught.

The sample size calculation in this study followed Yamane (1973). It was a reliable and valid formula to calculate sample size in quantitative research studies, especially when the population size was known. The total number of the population who enrolled in the subject called *Everyday English Reading and Writing* was 300 freshmen students. The formula was shown below.

The formula is: $n = N / (1 + N(e)^2)$

The 'n' is the sample size. 'N' is the population size and 'e' is the desired margin of error. This formula can identify how many individuals should be included as a sample to represent the larger population. After calculating, the sample size in this study was 171.43 freshmen at PSU, Surat Thani Campus.

The sampling in this study was *stratified random sampling. Stratified random sampling* was a type of probability sampling (Pajo, 2018). The participants in the study came from different groups. Each group was called *a stratum.* After that, every student in the same stratum had equal chance to be the sample in the study (Pajo, 2018). As such, the sample led to the generalizability of the results of the study.

In semester 2/2024, there were nine sections of this subject. The students from the same faculty enrolled to study together with the same section. There were approximately 60-65 students in one section. The samples in this study cover three sections called *three strata.* Each strata represented the first-year students in their own faculty. Gathering the participants in this way saved time and money (Pajo, 2018). The participants in this study were IT students, business management students and fisheries students. Finally, they were representatives of the whole population from PSU, Surat Thani Campus.
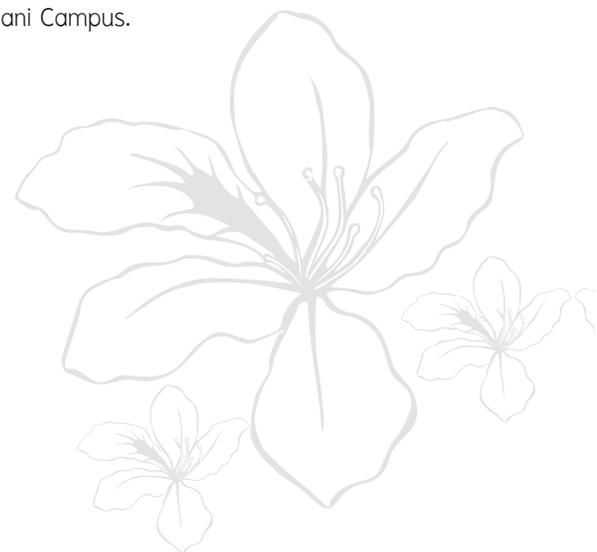
Table 2 Students' Grades for the Subject *Everyday English Reading and Writing 2/2024*

	Business Management	Information Technology	Fisheries	Total
A	7	4	4	15
B+	2	7	6	15
B	4	6	8	18
C+	10	9	7	26
C	9	13	7	29
D	7	7	7	21
D+	11	12	4	27
F	5	2	13	20
Total	55	60	56	171

Table 2 shows the grades for the subject *Everyday English Reading and Writing* in semester 2/2024 among the three groups of learners. Those students who received the grade C or above among Business management, IT and fisheries were 58.18 percent, 65 percent and 57.14 percent. These three groups shared the similarity of their English skills, where the average of their English reading and writing was between D+ and C+, or 55–65.

Instruments

Since the freshmen are preparing their academic writing in English for essays and their research studies in the near future, the focus of this study is on how temporal adverbial clauses are used in academic writing correctly and appropriately.

The instruments in this study were developed from Wongkittiporn and Kaewkasi (2025). They studied the adverbial connectors of temporal adverbial clauses in Q1 SCOPUS academic research papers. The results showed that the top five frequently used adverbial connectors of temporal adverbial clauses in academic texts included *before, after, when, while* and *until*. These connectors were selected based on the criteria of *frequencies* from authentic texts in the context of academic research writing. As suggested by Bergin (2018), frequency was commonly used to indicate to classify high and low information. To prepare Thai EFL learners for their academic writing, these five adverbial connectors were developed into a GJT including 10 items. The test was divided into two sections: personal information and the test of temporal adverbial clauses. The first section was the participants personal information, including gender, faculty and duration of English studies as exemplified below.

Faculty

☐ Faculty of Liberal Arts and Management Sciences

☐ Faculty of Science and Industrial Technologies

☐ Faculty of Innovative Agriculture and Fisheries

This could be gathered as variants to examine whether different clusters of participants may understand the pragmatic principle concerning iconicity of sequence and temporal adverbial clauses in English. The testing on iconicity of sequence and temporal adverbial clauses in English was based on the following instruction: Choose only one item from the following pair that is perceived as the most appropriate. The instrument was a *Grammatical Judgement Task* (GJT). According to Sándor (2016), GJT was the instrument to measure the learners' grammatical

knowledge in an explicit way. It could be used to check the learners' grammatical knowledge, morphological knowledge and structural knowledge effectively. To avoid bias on the contents given in each sentence, the contents in the GJT task were about everyday life, such as routine, food and school as exemplified below.

After

(a) After Tom takes a bath, he goes to bed.

(b) Tom goes to bed after he takes a bath.

Before

(a) Before the meal, Christians pray to thank God.

(b) Christians pray to thank God before the meal.

Until

(a) James studied at the University of Cambridge until he graduated with a master's degree.

(b) Until James graduated with a master's degree, he studied at the University of Cambridge.

With each pair, the participants were instructed to read and choose only one answer. The adverbial connectors in this study include *when*, *while*, *before*, *after* and *until*. To avoid the participants' stress when completing the experiment, they were informed about the principle of *appropriateness* instead of *grammaticality* or *accuracy*.

Instrument Validation

The instrument of data collection in this study was validated via IOC (*Index of item objective congruence*). Three inter-raters including one retired native Australian instructor and two experts in the field of English from renowned universities in Thailand were the instrument validators. Each item was validated based on IOC via the following scheme. Agreement, undecided and disagreement were + 1, 0, and –1, respectively. The IOC reliability score of the GJT task was reported at 95.5%. This percentage was highly accepted.

Data Collection

After the learners showed their willingness to voluntarily participate in the current research study, the researchers followed the norm of practice as suggested in the national training of ethical consideration. A research assistant was the one who acted as the data collector.

Both learners and research assistant were strangers as they did not know each other before. This method of data collection was recommended by Aldridge (2014). The participants would not be influenced by the researcher's power and friendship as their classroom lecturer. The research assistant entered the classrooms and explained the objectives of the study in the participants' mother tongue. Then research assistant asked the students to voluntarily join the study by completing the given tasks. The participants were given a task to complete within 25 minutes.

The research assistant collected the data from 171 participants who participated in the study of iconicity of sequence in temporal adverbial clauses. In addition, to make sure that the participants paid attention when completing the task in this study, the GJT task was given on the date of their class quiz. The students sat separately in an exam room. After they finished their quiz, they completed the GJT task.

Data Analysis

The data analysis in this study was inferential statistical analysis. In order to seek a statistically significant relationship between variables, *Pearson Correlation* was applied. Pearson correlations were the inferential statistics to measure the relationships between the two variables. The result had a value between –1 and 1 (Creswell & Creswell, 2022). The *p*-value that was less than 0.05 showed a statistically significant relationship between the two variables. The statistical analysis of Pearson Correlation allowed the researchers to examine that the learners had linguistic competence of information

structures. The inferential statistical analysis of *Pearson Correlation* was particularly suitable in this study as it could answer the research question. As discussed by Fromkin, Rodman and Hyams (2018) regarding what we know when we know a language, the learners either **KNOW** or **DO NOT KNOW** information structuring of complex sentences in this study.

The inferential statistical analysis of *Pearson Correlation* was assigned according to the following conditions as presented in Table 3.

Table 3 Data Analysis of Iconicity of Sequence

Code 1–KNOW	Code 2–DO NOT KNOW
If the participant chose the token of adverbial clauses that **did follow** iconicity of sequence, code 1 was given.	If the participant chose the token of adverbial clauses that **violated** iconicity of sequence, code 2 was given.

Example of Data Analysis

☑ (1a) After Tom takes a bath, he goes to bed. (Compliant)

☐ (1b) Tom goes to bed after he takes a bath. (Non–compliant)

Examples (1a) and (1b) illustrated how the data in this study were analysed. The participants chose (1a), which was compliant with the rule. Hence, code 1 was given. The data was keyed into SPSS 29 to calculate (Cronk, 2024). The researchers selected 2 tails so that whether the results were plus or minus would not affect the statistically significant relationship between the variables. In scientific research in social sciences and humanities, a *p*–value that was equivalent to or less than 0.05 showed a statistically significant relationship (Creswell & Creswell, 2022).

The Results

This section reports the results in this study. Primarily, the results showed that there was no difference in the results between different strata. The faculties the participants chose to study in did not affect the relationship between the use of iconicity of sequence and temporal adverbial clauses in English as revealed in Table 4.

Table 4 Significant Relationships between Temporal Adverbial Clauses and Use of Iconicity of Sequence among Freshmen's Low Proficient Levels of English

Pearson Correlation		Iconicity of Sequence
1. Freshmen whose proficient levels of English were low and their use of temporal adverbial clauses *after*	Correlation	.054
	Sig. (2–tailed)	.480
2. Freshmen whose proficient levels of English were low and their use of temporal adverbial clauses *before*	Correlation	–.065
	Sig. (2–tailed)	.398
3. Freshmen whose proficient levels of English were low and their use of temporal adverbial clauses *until*	Correlation	.118
	Sig. (2–tailed)	.125
4. Freshmen whose proficient levels of English were low and their use of temporal adverbial clauses *when*	Correlation	–.064
	Sig. (2–tailed)	.402
5. Freshmen whose proficient levels of English were low and their use of temporal adverbial clauses *while*	Correlation	–.004
	Sig. (2–tailed)	.958

Table 4 illustrates significant relationships between freshmen whose proficient levels of English were low and their use of temporal adverbial clauses in English. Via grammatical judgement tasks, there was no statistically significant relationship between the first-year undergraduate students whose levels of English proficiency was low and their use of iconicity of sequence in temporal adverbial clauses. The p-value of the adverbial connector *after* was reported at 0.48 which was higher than 0.05. The p-value of the adverbial connector *before* was reported at 0.398. The p-value of the adverbial connector *untill* was reported at 0.125. The p-value of the adverbial connector *when* was reported at 0.402. Finally, the p-value of the adverbial connector *while* was reported at 0.958.

Conclusion

The results in this study showed there was no statistically significant relationship between the low proficient level of freshmen at Prince of Songkla University, Surat Thani Campus and their use of iconicity of sequence of adverbial clauses in English. In other words, they could not write in English according to the real-world event what happen before and after appropriately. A possible reason was that the participants in this study were the groups with lower English proficiency. They had very limited knowledge about the structure of temporal adverbial clauses in English unless taught in English classrooms. The one that they seemed to know was the temporal adverbal connector *until* which indicated an end point. The rest was far beyond their English proficiency. From the findings in this study, there was no doubt why the freshmen at PSU, Surat Thani Campus had struggled with the assignments of written tasks in English.

Discussion

Low Proficiency & Iconicity of Sequence

The results in this study showed that there was no significant relationship between Thai EFL learners' use of iconify of sequence and temporal adverbial clauses in English. This group of participants were freshmen, PSU, Surat Thani Campus from the Faculty of LAMS, Faculty of SIT and Faculty of IAF. They enrolled in the subject *Everyday English Reading and Writing.* Their average grades of the subject were between D+ and C+.

From the contributions of linguistic theories to applied linguistics among Thai EFL learners, Givon (1985) pointed out that the theory of iconicity of sequence was the ordering of information according to real-world events. This supported the workload of the human brain in analyzing data. It was how language users to manage information to be sequential. Thus, Givon's (1985) theory of iconicity of sequential order could be applied as an indicator to divide low and high proficiency English learners.

Moreover, this study also contributed to the theory of Grice's (1975) maxim in pragmatics concerning *principle of relevance*. This suggests that information given to the hearer should be sequentially in order and relevance. Jumping back and forth would lead to the hearer's confusion. When contributing this pragmatic principle to low proficiency EFL learners, it showed that they had not acquired this pragmatic competence yet. Beginner EFL learners showed difficulty in using complex sentences. The results in this study were in line with Cahyono et al. (2016) who studied Indonesian EFL leaners' writing of complex sentence. The results of the current study showed that beginner EFL learners had not yet acquired the competence to use complex sentence with temporal adverbial clauses. The p-value of the temporal adverbial heads *after, before, until when* and *while* were 0.48, 0.39, 0.12, 0.40 and 0.95, respectively. According to Richards and Rodgers (2014), teachers should start the lesson by linking the learners'

old knowledge to the new knowledge via *scaffolding*. This seemed to be the old knowledge that they had from their high-school years. It could be used as the given knowledge to scaffold them to have the new knowledge in forming temporal adverbial clauses in English. When comparing the results of this study with previous studies, it confirmed that the complex structure of temporal adverbial clauses is a structure that higher proficiency learners use often and correctly. According to Yilmaz and Dikilitas (2017), B2 Turkish undergraduate students were examined regarding their structural production of adverbial clauses in argumentative essays. The results showed that B2 participants could produce the adverbials with a varieity of semantic denotations. A higher percentage was found with temporal adverbial clauses. Accordingly, this study implied that temporal adverbial clauses were the structures that could be used as an indicator to separate between lower and higher proficiency English learners.

Low Proficiency Learners

According to Holmes and Wilson (2022), *variants* such as age, gender, and socio-economic status. In addition to the variables of situations, speakers, languages and ages (Asrat, Mengistu & Assefa, 2025), the level of English proficiency had an influence of the sequential order of adverbial clauses in English. The variable to consider in this study was a low level of English proficiency students. Although they knew the form of adverbial clauses in English, they were not sensible about semantic denotations and iconicity of sequence of temporal adverbial clauses. Hence, it was arbitrary for them to use temporal adverbial clauses in English. The function of English for communication had not yet developed. It seems that the first-year students have

not yet realized the concept of variables in sociolinguistics when using English.

As supported by Leuckert (2018), temporal adverbial clauses were studied with native English (NE) speakers, ESL and EFL learners reported the different use of the adverbial connector *while*. The homonym *while* could be used temporally and contrastively. Despite having two variants semantically, the adverbial connector *while* with temporal denotations as used by NE and EFL was 23 times and 110 times. The variant *while* was preferred to be used contrastively among native English speakers. This shows that EFL learners both in Leukert's (2018) and in the current study did not understand the concept of variants. The temporal connector *while* was found to be the most confusing connector where the *p*-value was highly reported at 0.958. When teaching the adverbial connectors, such as *while* to EFL learners, they should be offered the notion of language variable.

Pedagogical Implications

Thai EFL learners in this study seemed to have problems with forming complex sentences, especially in temporal adverbial clauses. Pedagogically, they should be encouraged to study form and function at the same time (Richards & Farell, 2011). The form of finite adverbial clauses (see Murphy, 2018) should be introduced. The semantic denotations of temporal adverbial clauses including *before-while-after* should be pointed out with different variants of adverbial connectors (See Swan, 2015). For example, the connectors *while* and *since* have two senses. They should be used carefully. Once they have learned form and function, the pragmatics of structuring information should be scaffolded by different pedagogical teaching.
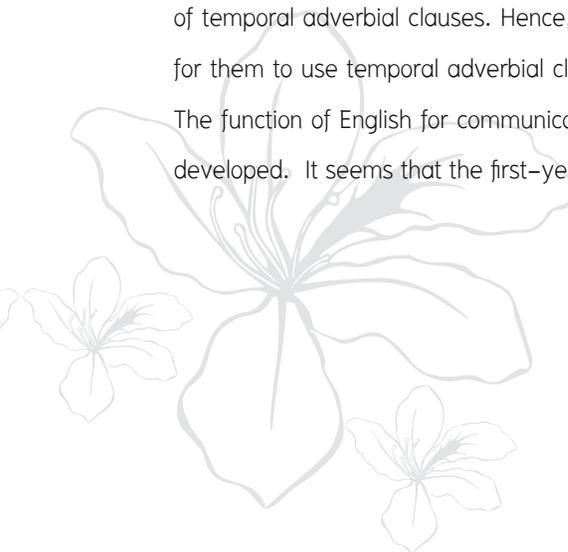
Figure 2 Pedagogical Implications for Structuring Information

Figure 2 illustrates an example how Thai EFL learners could be scaffolded to use complex sentences of temporal adverbial clause. The adverbial connector *after* is given on a flashcard. A picture of each different event has time to indicate its TP finiteness. The line in each chunk suggests that they should be structured as a clause including agents, action and temporality. Teachers may scaffold their learners by asking questions regarding *deixis* or indexical pragmatically. Levinson (1983) expressed there were relationships between structure and context. Type of deixis could be applied into interrogative forms. This one includes the use of pronouns, such as *he* and *she*.

Episode 1

When did the event take place? Temporal Deixis

In the first picture, what time did the situation take place? Temporal Deixis
Where did the situation take place? Spatial Deixis
How many people did you see in the first picture? Agent Deixis

Episode 2

With the second episode, the pragmatic discourse of givenness is applied to ask:

Were they the same people as the first picture? YES or NO

How many people did you see in the first picture?

In the second picture, what time did the situation take place? Temporal Deixis

Where did the situation in the second picture take place? Spatial Deixis

After that the teachers offer the learners pragmatic context, such as agents, places and time. Finally, the learners are instructed to apply the two episodes into a complex sentence with the connector *after*. With their teacher's support, the level of B1 and B2 according to CEFR could be reached ultimately.

Suggestion

Suggestions for the Application of Research Findings

The results of the current research study suggests that the Thai EFL learners need a significant improvement of their English language. Not only do the English language teachers in Thailand should focus on grammar and vocabulary in English, but also they should focus on how the students compose information together sequentially for the benefits of their writing skills. This would effective communication once language is applied especially in formal situations, such as the context of lawsuits and medication.

Recommendation for Further Studies

For further research studies, the ideas of sequence and relevance via linguistics theory or iconicity and maxim or relevance could be further studied in

the branch of *forensic linguistics.* The data given by defendants could be gathered to study the sequential order and relevance of information. This could be studied regarding whether giving information to the court follows situations in the real–world events or not. Speaking the truth should be relevant and should follow the iconicity of sequence. Additionally, in the context of native English speakers, the temporal adverbial connectors such as *before, after,* and *until* can occur either before or after the main clause. It is the preference of native English speakers only under certain contexts, such as novels in English and writing a diary. To get insight into the sense of how native speakers use temporal adverbial clauses, it is recommended that a study could be designed involving two experimental groups. The first group could be native English speakers, but the second group should be non–native English speakers. Both groups can be presented with temporal adverbial clauses with a variety of contexts in order to investigate their preferences between native and non–native intuitions.

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