# THE EFFECTS OF TASK COMPLEXITY AND TASK CONDITION ON L2 INDIVIDUAL WRITING AND PEER INTERACTION

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**THE EFFECTS OF TASK COMPLEXITY AND TASK CONDITION ON L2 INDIVIDUAL WRITING AND PEER INTERACTION**

**ABSTRACT**

This study adopts the Cognition Hypothesis to examine the effects of task complexity, (*+/- causal reasoning demand*) and task condition (*individual*, *dyadic* and *triadic groupings*) on the L2 individual writing and peer interaction. A 2 (Task Complexity) x 3 (Task Condition) repeated-measures ANOVA (RM-ANOVA) research design, was employed on 36 Malaysian university students. Six argumentative topic-based written texts were produced by each participant in each of the three sessions. In each of the sessions, i.e. *individual*, *dyadic* and *triadic*, participants experienced two argumentative tasks: one *simple* and another *complex* based on the principle of natural complexity progression. The individual session was set as baseline data to compare results of the Second Language (L2) individual writing and peer interaction in dyadic and triadic conditions. For the dyadic and triadic sessions, participants first discussed each of the *simple* and *complex* topics given and then proceeded to write on each topic individually. In total, 216 written texts were analysed for lexical and syntactic *Complexities*, morphosyntactic *Accuracy* and *Fluency* (CAF) while transcripts of interaction totalling 15 hours were analysed in terms of Negotiation of Meaning (NoM), Language-Related Episodes (LREs) and uptakes of recast. Results of CAF on the L2 individual written production revealed that task complexity is statistically significantly different for certain dimensions of lexical and syntactic complexities, accuracy, text length but not for fluency. Task condition on the other hand, is statistically significantly different for the measures of lexical and syntactic complexities except for certain dimensions of complexities, like coordinate clause per T-unit, and accuracy, error-free clauses (EFC). For L2 individual writing, tasks that are more complex produced lengthier texts with higher

accuracy, EFC and greater syntactic complexity, for mean length of clause (MLC), but not for dependent clause per clause (DCC). As for task condition, triadic grouping produced lengthier texts with higher lexical complexity, for mean segmental type/ token ratio-50 (MSTTR-50) and greater syntactic complexity, for MLC. As for the measure of DCC, dyadic grouping produced dependent clauses that are more varied in the simple task. The baseline data of the individual session produced more fluent L2 individual writing, as compared to dyads followed by triads. Results of the measures of NoM, LREs and Uptakes on the peer interaction revealed that L2 learners in triadic grouping produced higher comprehension checks when negotiating meaning with peers. It also showed that dyadic grouping produced higher partially or incorrectly resolved LREs and unmodified uptakes of recast. In conclusion, the findings lent partial support to Robinson's Cognition Hypothesis that cognitively more complex tasks increased the L2 production of certain dimensions of lexical and syntactic complexities, like MSTTR-50, MLC and accuracy, EFC. As for the finding of the dimension of syntactic complexity, DCC, it seemed to have a trade-off effect as proposed by Skehan's Trade-off Hypothesis. Task condition with more number of participants assigned for peer interaction prior to L2 learners' individual writing seemed to contribute to higher MSTTR-50, MLC and EFC.

**KESAN-KESAN KOMPLEKSITI TUGAS DAN KONDISI TUGAS PADA PENULISAN INDIVIDU DALAM BAHASA KEDUA DAN INTERAKSI RAKAN**

**ABSTRAK**

Kajian ini menggunakan Kognisi Hipotesis untuk mengkaji kesan kompleksiti tugas, (+/- permintaan penaakulan sebab) dan kondisi tugas (individu, pasangan dan kumpulan bertiga) pada penulisan individu dalam Bahasa Kedua (L2) dan interaksi rakan sebaya. Langkah berulang telah digunakan pada 36 pelajar universiti Malaysia sebagai reka bentuk dalam penyelidikan ini. Enam tulisan berasaskan topik argumentatif dihasilkan oleh setiap peserta. Dalam setiap sesi iaitu individu, pasangan dan kumpulan bertiga, setiap peserta menglengkapi dua tugas yang berasaskan topik argumentatif, dengan dua tahap kompleksiti: satu mudah dan satu lagi kompleks berdasarkan prinsip perkembangan kompleksiti semula jadi. Sesi individu ditetapkan sebagai data asas untuk memeriksa peranan interaksi pada penulisan dalam L2. Bagi sesi pasangan dan kumpulan bertiga, peserta membincangkan topik yang diberikan dan kemudian menulis karangan berdasarkan topik tersebut secara individu. Keseluruhannya, 216 teks bertulis telah dianalisis untuk Kompleks leksikal dan sintektik, Ketepatan Morphosintetik dan Kelancaran (CAF) manakala transkrip interaksi berjumlah 15 jam dianalisis dari segi Episod Berkaitan Bahasa (LREs), Rundingan Maksud (NoM) dan pengambilan maklum balas daripada rakan sebaya. Keputusan komplesiti, ketepatan dan kelancaran mengenai penghasilan penulisan individu L2 menunjukkan bahawa kompleksiti tugas adalah berbeza secara statistik dalam dimensi mengenai kompleksitas leksikal dan sintektik, ketepatan, kepanjangan teks kecuali untuk kelancaran. Kondisi tugas adalah berbeza secara statistik bagi sesetengah dimensi kompleksiti leksikal dan sintektik, kecuali untuk dimensi seperti klausa penyelarasan bagi setiap T-unit, dan ketepatan, klausa yang bebas daripada kesilapan. Untuk penulisan individu dalam L2, tugas-tugas yang lebih kompleks menghasilkan teks yang lebih panjang dengan

ketepatan yang lebih tinggi, dan kompleksiti sinteks yang lebih tinggi, untuk fasal kepanjangan, kecuali untuk ayat klausa bergantung. Untuk kondisi tugas dalam kumpulan bertiga, teks yang lebih panjang dengan kompleksiti leksikal yang lebih tinggi telah dihasilkan, untuk jenis segmen/ token nisbah-50 dan kompleksiti sinteks yang lebih tinggi. Untuk ayat klausa bergantung, peserta dalam kondisi tugas pasangan menghasilkan klausa bergantung yang lebih bervariasi, terutamanya dalam tugas yang bertahap mudah. Data asas sesi individu menghasilkan lebih banyak penulisan dalam L2 yang lebih lancar, berbanding dengan pasangan diikuti oleh kumpulan bertiga. Keputusan untuk rundingan makna, episods yang berkaitan dengan bahasa, dan pengambilan maklum balas daripada rakan dalam interaksi dengan rakan sebaya, ia menunjukkan bahawa pelajar-pelajar dalam kumpulan bertiga menghasilkan interaksi mengenai pemeriksaan pemahaman yang lebih tinggi apabila merundingkan makna dengan rakan sebaya. Ia juga menunjukkan bahawa peserta dari pasangan kondisi tugas menghasilkan episods berkaitan dengan bahasa yang separuh betul ataupun yang salah dan pengambilan maklum balas yang tidak diubah. Kesimpulannya, keputusan ini memberikan sokongan separa kepada Hipotesis Kognitif yang diasaskan oleh Robinson bahawa tugas yang lebih kompleks dari segi kognitif meningkatkan penghasilan kompleksiti leksikal dan sinteksik dalam bahasa kedua. Bagi keputusan dimensi kompleksiti sintektik, ia seolah-olahnya mempunyai kesan trade-off seperti yang dicadangkan oleh Trade-off Hipotesis oleh Skehan. Kondisi tugas dengan mempunyai bilangan pelajar yang lebih banyak untuk interaksi dengan rakan sebaya sebelum penulisan individu dalam bahasa kedua seolah-olah memanfaatkan dimensi kompleksiti leksikal dan sintektik.

Kata Kunci: Kompleksiti Tugas, Kondisi Tugas, Hipotesis Kognitif, Penulisan Individu dalam Bahasa Kedua, Interaksi Rakan Sebaya

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All remaining errors are mine.

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-/+ : Continuum +/-, which is attached to the assessed components in a study, indicates that "there is relatively more versus relatively less" of the component (Robinson 2001b, p.30). The components may be the task complexity, the number of participants, the allocated time, etc.

CAF : Complexity, Accuracy and Fluency are the global linguistic measures used to assess the dimensions of second language production, proficiency and development, in the field of second language acquisition and applied linguistics.

LREs : A language-related episode (LRE) is any part of a dialogue where language learners talk about the language they are producing, question their language use, or correct themselves or others (Swain and Lapkin 1998, p. 326)

RM : Repeated measures (RM) design is a research design that involves multiple measures of the same variable taken on the same or matched subjects either under different conditions or over two or more time periods.

SLA : Second-language acquisition (SLA), second-language learning, or L2 acquisition, is the process by which people learn a second language.

NoM : Negotiation of meaning is a process that speakers go through to reach a clear understanding of each other. Asking for clarification, rephrasing, and confirming what you think you have understood are all strategies for the negotiation of meaning.

TBLT : Task-based language teaching (TBLT), also known as task-based instruction (TBI), focuses on the use of authentic language and on asking students to do meaningful tasks using the target language.

tblt : As critiqued by Long (2015), tasks in lower case of tblt are usually not relevant to students' real-world activities.

**CHAPTER 1: INTRODUCTION**

**1.1 Introduction**

This chapter provides the background and the rationale for the study framed within the field of second language acquisition (SLA) as well as language learning and assessment. In a task-based language teaching and learning context, it further delineates the role of task complexity as the potential trigger of communicative language approach for the production, development and acquisition of the interlanguage system of L2 learners. It also argues that task condition plays an important role in preparing an L2 learner's cognitive system and the way it affects their L2 production via tasks. This chapter also presents the background of the study, the statement of the problem, its research gap, and the purpose of the study, the context of the study, research questions, as well as the significance of the study.

**1.2 Background of the Study**

As Second Language Acquisition (SLA) field evolves, an educational paradigm shift is observed. The direction of language learning and teaching has gradually moved from behaviourism to constructivism throughout the four decades. Constructivism suggests that human beings construct knowledge and meaning from their daily encounters and experiences. To create such an experience, tasks are often used as the pedagogical intervention to condition learners to interact using the target language; in order to complete the task assigned by the facilitators. The use of target language to convey meanings or construct ideas or exchange information when performing the task, serves a communicative

function, which facilitates Second Language development and acquisition (Willis & Willis, 2001; 2008).

In the field of Task-based Language Teaching (TBLT), there is a growth of interest among researchers, syllabus designers as well as teachers in examining how tasks serve as a communicative language teaching approach (Bygate, Swain, & Skehan, 2013; Ellis, 2003a; Garcia Mayo, 2007; Long & Crookes, 1992; Peter Robinson & Gilabert, 2007; Samuda & Bygate, 2008). Tasks that are usually adopted in language classes are pedagogical speaking and writing tasks.

Unlike speaking, writing is hardly an inborn skill, in which one can acquire naturally. However, writing skills can be learned through multiple drills result from practices and experiences. As writing in L2 is unlike writing in L1, it is a more challenging process. However, writing in L2 has been considered as a learnable and trainable skill, thus, teaching L2 writing is often taken for granted with the conventional teaching methods, such as repeated drillings and rote learning that it would contribute to L2 acquisition.

Since the 1970s, the studies pertaining to the instruction-based L2 writing learning and teaching have emerged in Second Language Acquisition (SLA) (Nystrand, Greene, & Wiemelt, 1993; Raimes, 1991, 1998). Since then, the focus has always been placed on the traditional teaching with explicit emphasis of overt linguistic features and grammar rules. After the shift of the educational paradigm, the natural occurrence of interaction during the task completion has gradually attracted a great attention from the TBLT researchers.

The researchers positively believe that the interactional occurrences provide L2 learners a platform with the enriching learning opportunities for the L2 production and development; instead of just emulating a form of communication that can hardly be applied to any real-life situations.

From the cognitive perspective, a well-established task is capable of stimulating and heightening L2 learners' cognitive system, for example, L2 learners are able to operate their attentional mechanisms and memory resources more effectively while performing any tasks. Tasks can induce L2 learners to stretch their interlanguage systems beyond the limits of its current norm. According to Robinson's (2001, 2003, 2005, 2007) Cognition Hypothesis, task complexity has the potential to affect L2 learners' cognitive systems. Tasks that are cognitively more complex tend to trigger L2 learners to stretch their interlanguage system to provide a greater amount of complex lexis and a variety of complex sentence structures. Moreover, the Cognition Hypothesis also predicts that tasks that are more complex heighten L2 learners' attention to produce L2 production that is more grammatical accurate.

To understand to what extent the complexity level of a task influences the cognitive processing of the L2 learners, Complexity, Accuracy and Fluency (CAF) are the commonly adopted measures to gauge the L2 learners' L2 production, performance and development. A number of studies have examined the effects of manipulating task complexity on the learners' L2 production by measuring their L2 outcomes, in terms of the lexical and syntactical Complexities, grammatical Accuracy as well as Fluency (Frear & Bitchener, 2015; Ishikawa, 2007; Kuiken & Vedder, 2007, 2008, 2009, 2011, 2012; Michel et al. 2012; Rahimi, 2018; Ruiz-Funes, 2015).

From the interaction perspective, a task can be manipulated with different interactive factors, such as task condition to induce L2 learners to actively contribute ideas during the interaction when performing the task. It is believed that tasks can push L2 learners to interact with each other in order to meet the functional and communicative demands. In this case, it provides L2 learners with rich learning opportunities to speak, reflect upon and discuss ideas when the peer interaction takes place. Some of the interactional features that are claimed to

be conducive for SLA are Negotiation of Meaning (NoM) (Long, 1983), and Language-Related Episodes (LREs) (Swain & Lapkin, 1998) which among others include recast (Nicholas, Lightbown, & Spada, 2001) and (self-/other-) repairs (Kormos, 1999). During the interaction, interlocutors tend to use conversational scaffolding techniques, such as Negotiation of Meaning and its associated features like *Clarification requests*, *Confirmation checks* and *Comprehension checks* to amend conversational gaps when communication breakdown occurs or to progress an interaction or communication.

In addition, interlocutors also use meta-talk like Language-Related Episodes to discuss or question rules or forms of the language they are producing (Swain & Lapkin, 1998) when there seems to be a potential or an already interactional moment that impedes the idea exchange. Concerning the evidence for the task-based interaction on the acquisition of L2, a considerable number of studies have been conducted and the task-based interaction is claimed to have improved the linguistic structures (Keck et al. 2006), for interaction in general (Mackey & Goo, 2007) and for corrective feedback, in particular (Bitchener & Storch, 2015; Li 2010; Russell & Spada 2006). Mackey and Goo (2007), made a strong remark in their review as "Interaction plays a strong facilitative role in the learning of lexical and grammatical target items."

For extensive discussion and reviews of the supporting literature regarding the wonder of task-based interaction on the SLA, see Ellis (2008b), Gass (1997, 2003), Gass and Mackey (2007), Gass, Mackey, and Pica (1998), Gor and Long (2009), Mackey (2007, 2013), Mackey, Abbuhl, and Gass (2014) and Pica (1994).

From the cognitive-interaction standpoint, Robinson's Cognition Hypothesis and its associated Triadic Componential Framework (TCF) (as shown in Appendix A) have established a pedagogical task classification, which draws together cognitive and interaction

schemas. Furthermore, it also provides the theoretical ground and clear variables for potential researchers, syllabus designers or teachers to operate, analyze and explicate the possibilities of manipulating task features and task designs that will affect the L2 production, development and acquisition.

Among the literature that examined task complexity on L2 production, only a few studies had adopted the Cognition Hypothesis to underpin their studies (Ellis, 2005; Gilabert, 2007; Nariman-Jahan & Rahimpour, 2011; Révész, 2011; Skehan & Foster, 1999; Wigglesworth, 1997). For those TBLT studies that have adopted the Cognition Hypothesis, a majority focused solely on the individual oral production (Révész, 2009a, 2009b, 2011; Révész, Sachs, & Hama, 2014; Robinson, 2001b, 2003b, 2007a).

Only a few studies investigated the effects of task complexity on the learners' dialogic interaction (Gilabert, Barón, & Llanes, 2009; Kim, 2009; Mitchell, Myles, & Marsden, 2013; Nuevo, 2006; Révész, 2007; Robinson, 2001a, 2001b, 2007b; Robinson & Gilabert, 2007). A very limited number of studies investigated the effects of task complexity on the L2 written production as the outcome variables (Frear&Bitchener, 2015; Ishikawa, 2007; Kuiken & Vedder, 2007, 2008, 2009, 2011, 2012; Michel et al. 2012; Rahimi, 2018; Ruiz-Funes, 2015).

As noted by Kuiken and Vedder (2007), the criteria stated in the Triadic Componental Framework or the Cognition Hypothesis is not free of critique as the validity of the framework has not yet been fully empirical tested and therefore they might not be operationally feasible. Many researchers and scholars have called for further research to investigate some of the criteria listed in the TCF and Cognition Hypothesis (Kuiken and Vedder, 2007). Even though the aforementioned problems have been debated for decades, there were only a few empirical studies (Révész, 2011; Robinson, 2001b, 2007b; Robinson & Gilabert, 2007) investigating the combined effects of task features pertaining to cognitive

and interactive factors. However, thus far, [1]no empirical study has been conducted to examine first, the synergistic effects of task design variable, that is *task complexity (i.e. -/+causal reasoning demands)* and implementation variable, that is *task condition (i.e. +/- number of participants)* on interaction or/and L2 written production, and second, the effectiveness of the combined features on the uptake of recast.

Robinson's and Skehan's attentional models have been debated on for over two decades. According to Robinson's TCF, each factor stated in the framework has the potential to affect learners' output, if the complexity level of the task is designed in which the task complexity is increased from the resource-directing variables. The main argument of the Cognition Hypothesis is that task complexity is the sole major factor that affects L2 learners' production, in terms of their accuracy and complexity.

In Skehan's (1998) view, due to the limitations of the human attentional resources, learners are unable to attend to all language aspects simultaneously, e.g., complexity, fluency, accuracy during the production. Thus, the use of tasks can either promote the increase of complexity or accuracy, but never both.

### 1.2.1 Task Complexity in Second Language Writing

Task complexity is one of the cognitive elements inherited in a task (Robinson, 2001, 2003, 2005; Skehan, 1996, 1998). It is believed to influence human linguistics cognition in producing higher accuracy and complexity, when dealing with a task that is cognitively more

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1I contacted Robinson via email in Nov 2016 (as shown in Appendix B) pertaining to the feasibility of the proposed research framework. He confirmed its feasibility and stated that, to date, no study has looked into the synergistic effects of task complexity and task condition *+/- number of participants* on L2 writing. He also suggested to take note of the participants' interaction. In line with Cognition Hypothesis, he predicts that more interaction with the following episodes (negotiation of meaning, LREs and recast) will be observed in a more complex task, regardless of the number of participants.

complex. Previous literature pertaining to the investigation of task complexity has been carried out mostly on the spoken form, very little focus is placed on the written form. Following the Cognition Hypothesis, some factors categorized under the dimension of task complexity along with resources-directing variables in the TCF (see Appendix A), such as *causal reasoning demands* seems to be an underexplored elements, especially on the L2 writing context. To induce learners to communicate, *causal reasoning demands* seem to be able not only to stimulate learners to think critically, but also prompt them to express more. Hence, in this study, the construct of task complexity was manipulated with -/+ causal reasoning demands to determine the complexity level of a task.

In this study, the outcome variables set to examine the task effects on the L2 individual writing are the global linguistic measures, lexical and syntactic complexities, grammatical accuracy and fluency.

### 1.2.1.1 Lexical and Syntactic Complexities

With regard to the global linguistic measure of complexity, this study examined the lexical and syntactic complexities. The measures chosen for the lexical complexity is MSTTR-50, a commonly adopted measure in the previous literature (Rahimi, 2018). The function of MSTTR-50 shows the ratio of the use of different vocabularies in every 50-word text.

As for the syntactic complexity, the most recently used measures to determine the complexity of sentence structures are, mean length of clause, dependent coordinate clause and coordinate phrase clause. As each name suggests, a coordinate clause usually forms part of the sentences with conjunction *and, or* or *but* to provide of a complete sense in a sentence.

For example, two coordinate clauses are found in the following sentence, *He is poor in English language, but he is enthusiastic about learning English*.

As for the subordinate phrase, it depends on a main clause for the complete meaning of a sentence. For example, a subordinate phrase is embedded in first part of the following sentence in which it relies on the main clause, the latter part of the sentence for a comprehensive meaning, *Though she is poor, she is happy*.

Overall, the phenomena of the variety use of different vocabulary and the embedding clauses and phrases in the sentences in an L2 written text indicate the complexity levels of the vocabulary as well as sentence structures.

### 1.2.1.2 Accuracy

In addition to the measure of complexity, this study also examined another outcome variable, which is the grammatical accuracy. The measure of grammatical accuracy employed in this study is based on the frequency of the error-free clauses. The reason clauses were examined instead of a T-unit, which is a full sentence, being is that the measure of clauses in each sentence is stricter in determining smaller units of grammatically formed clauses. According to Hunt (1964), a T-unit refers to a main clause plus all subordinate clauses and non-clausal structures that are embedded in it. That is to say, smaller clauses or phrases that are being statistically analyzed would increase the internal validity of the linguistic measurement.

### 1.2.1.3 Fluency

Moreover, like Larsen-Freeman (2006), the third global linguistic measure that is being examined in the L2 writing is fluency. Fluency is no longer only being assessed in the

spoken form. Although the Cognition Hypothesis predicts that fluency of L2 learners tend to decrease as task complexity increases, this study still took into consideration to what extent task complexity affects the fluency of the L2 performance. To determine the fluency of the L2 production, the measure of the total error-free words over the total T-units (Larsen-Freeman, 2006) were used in the analysis of the fluency in the individual L2 written text.

### 1.2.2 Peer Interaction in Different Task Conditions

As for the peer interaction, it seems that there was a scarce number of studies synergising the effects of task complexity and task condition, with the manipulation of different number of participant grouping for peer discussion (Robinson, 2017). Some of the collaborative learning studies have investigated the effects of collaborative task completion on collaborative writing (Elola & Oskoz, 2010; Fernandez Dobao, 2012, 2015). From the cognitive-interaction perspectives, not many studies focused on the impact of collaborative discussion on an individual level. The Cognition Hypothesis predicts that learners produce higher accuracy and complexity, but not fluency in their L2 production, regardless of task condition, however, this study opines that task condition might moderate the linguistic production of the L2 learners to a certain extent.

Up to date, it seems that none has ever examined if there is any statistically significant difference of different grouping discussion on the L2 learner's individual learning. Thus, this study conducted the investigation of the effects of task complexity and task condition with the same population of learners to experience dyadic and triadic group discussions, in simple and complex tasks respectively. According to the personal communication with Robinson (2016) (refer to appendix B), he maintains that there would be more interaction as well as

negative feedback, LREs and uptake of recasts in the cognitively more complex tasks, as predicted by the Cognition Hypothesis, regardless of dyadic or triadic grouping condition.

In this study, the outcome variables set to examine the task effects on the peer interaction are the interactional features, such as Negotiation of Meaning (NoM), Language-Related Episodes (LREs) and Uptakes of recast.

### 1.2.2.1 Negotiation of Meaning (NoM)

Negotiation of meaning (NoM) is a communicative process in which learners use some interactional strategies like clarification request, comprehension check, and confirmation check in order to attain a clearer understanding of each other. According to Long (1996, p. 418), when L2 learners communicate with their peers, they tend "to provide and interpret signals of their own or their perceived comprehension, thus provoking adjustments to linguistic form, conversational structure, and message content. In Long's Interaction Hypothesis (1985, 1996), the development of second language is often promoted via face-to-face interaction and communication.

To date, there are only a limited number of studies examining the effects of task features on the interactional production, in terms of negotiation of meaning (Gilabert et al., 2009; Nuevo, 2006; Robinson 2001b, 2007a). Moreover, a scarce number of studies have looked into how different number of participant groupings interacted differently when attempting simple and complex task. Some of the examples of the interactional features, for clarification request is *I am not quite sure if I get what you are saying*. This interactional feature is usually used to self-check if the learner has understood the information exchanged in the conversation. As for the example of the comprehension check feature, such as *do you*

*understand* is often used to check other's understanding of the speaker's preceding message. As for the confirmation check, some repetition of part of the preceding utterance with rising intonation is used to confirm the understanding of the preceding utterance, for example, learner A says *the bridge is collapsed*, learner B repeats with rising intonation, asks *the bridge? The bridge, right?,* in order to ensure the exact idea has been obtained.

To investigate to what extent L2 learners in the dyadic and triadic conditions negotiate meanings with different interactional features of NoM, this study investigated the effects of task condition in which L2 learners were grouped in dyads and triads for peer discussion for simple and complex tasks.

### 1.2.2.2 Language-Related Episodes (LREs): Recast

As delineated by Swain and Lapkin, Language-related Episodes (LREs) is "any part of dialogue where the students talk about the language they are producing, question their language use, or correct themselves or others" (1998, p. 326). LREs are always used as an important construct to examine learners' linguistic awareness in an L2 context and to explore the contributions that the linguistic output of learners make in the L2 development.

In this study, the language-related episodes (LREs) focused on the recast parts, that is, when learners corrected themselves or others in which the recast episodes produced during the interaction are related to language forms. That is to say, the recasts embedded in the language-related episodes are operationalized as the utterances produced by the speakers when trying to self-repair or repair other's utterance that focuses on form, instead of meaning.

According to Lyster and Ranta (1997), recasts are "reformulation of all or part of a student's utterance, minus the error" (p. 46). Although recasts are commonly regarded as

implicit feedback since there is hardly any overt indication that the learner committed an error with overt error correction and metalinguistic feedback (Long & Robinson, 1998), recent research suggests recasts as "implicit feedback" can be misleading. This is because some recasts appear to be explicit based on how the interlocutors deliver (Egi, 2007a; Ellis & Sheen, 2006; Loewen & Philp, 2006; Nassaji, 2007, 2009; Philp, 2003; Sheen, 2006). The current study, looked into the LREs from the recast perspective. Any overt or covert efforts to correct the error produced by self or others or to provide feedback in order to help amend a communication breakdown were correspondingly considered as recasts.

This natural interactional phenomenon in fixing the conversational gap be it related to content or not, provides recast that molds someone's utterance, in which it is claimed to automatically shift one's attention from subject matter to language form. This occurs when one uses the target language as a vehicle to transmit the message, the awareness of the mismatch between the L2 learners' current knowledge in addressing the message and the incapability to convey the message in the target language has been noticed by the learners. Once they have noticed the mismatch, they either discuss, question or correct themselves or their peers. With the immediate linguistic input from their peers, it serves as an enriching learning opportunity to shift the learners' focus on linguistic form. Gass and Mackey (2007) asserts that the moments of producing LREs in order to solve the language-related problems represent language learning in progress.

Some recent research (Adams & Ross-Feldman, 2008; García Mayo & Azkarai, 2016) investigated the effect of spoken and written task modalities on the nature of LRE revealed that speaking tasks led to more meaning-focused LREs, while those focused on the written task triggered more form-focused LREs. In this study, the LREs are operationalized with any part of dialogue where learners respond only on the language-related matters,

focusing on recasts provided. Based on the previous literature (Egi, 2007, 2010; Gracia Mayo, 2017) and the findings of this study, the types of LREs are categorized into correctly resolved, partially or incorrectly resolved, unresolved and no recast.

The first type of LRE in which the recast is identified in this study is the correctly resolved LRE. Correctly resolved LRE is a part of dialogue where the learners successfully resolved the language issues they discussed, produced or questioned. As shown in Table 1.1, during the peer interaction, learner A could only think of the word, *shenzhe* meaning *promotion* in his L1, Chinese Mandarin, so, he uttered, *shenzhe* instead of *promotion*. Learner B noticed that there is a need to recast learner A's utterance, so he offered assistance by providing immediate input, the vocabulary, *promotion*. In this case, learner B provided recast *promotion* to resolve the language difficulty faced by learner A. Thus, learner B successfully and correctly resolves the linguistic problem during the peer interaction. Then, learner A noticed the salient immediate input provided by his peer, so he uptook the recast, *promotion* as part of his following elaboration.

**Table 1.1: An Example of the LRE- Correctly Resolved Recast during Peer Interaction**

| | |
|---|---|
| A: *Shen zhe* (in Chinese Mandarin, means promotion) | LREs- seeking help in Chinese Mandarin |
| B: Oh, ah….*promotion*? | Recast- Correctly Resolved LRE |
| A: Yea, higher chance to get *promotion*. That's why attitude is more important | Uptake of recast (lexical expanded to morphosyntax) *modified |

With regard to partially or incorrectly resolved LRE, it is a part of a dialogue that the learners attempted to resolve the language issues they were discussing, producing or questioning, however, they could only partially or incorrectly resolved the language issues.

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As shown in Table 1.2, during the peer interaction, learner A had wrongly used the vocabulary, *comparative*, to describe a person being ambitious. Learner B noticed that there is a need to recast learner A's utterance as *comparative* was not a right vocabulary to describe the situation, so, he offered assistance by providing immediate input, the vocabulary, *over competition*. In this case, learner B only managed to partially correct the linguistic problem as the correct form of vocabulary to describe that situation should be *over-competitive*, in adjective, instead of *over competition* in noun. Although the vocabulary, *over-competitive* recast by learner B connotes closer meaning to *competitive* as compared to the wrong form of word, *over competition* provided by learner A, it is still deemed partially and incorrectly resolved LRE.

**Table 1.2: An Example of LRE- Partially or Incorrectly Resolved Recast during Peer Interaction**

| A | mm.. maybe they feel that they are superior, Feeling they are more superior than other la, | |
|---|---|---|
| B | Mm.. They are more smart than other, they are better than others | |
| A | Yea, *how to say this one*? Ah..comparative..ah.. | Seeking help |
| B | *Over competition*? | Recast- LRE- lexical Partially Resolved |
| A | \<whispering while writing: over competition in…\> | |

Unresolved LRE is a part of dialogue where the learners realized that there was a need to recast the dialogue and attempted to resolve the language issues they realize, discuss, produce or question the language issues. However, the linguistic problem is still remained unresolved as the learner might not be able to produce any recast to resolve the problem. As shown in Table 1.3, learner A was describing a situation but he was not sure if it should be called *stubborn*, so he tried to confirm with learner B and asked him, *is that stubborn* with rising intonation. Learner B seemed to attempt to resolve the problem, however, he was

uncertain of what the exact word should be, so he had an incomplete utterance *is like...* in which it shows that the linguistic problem remained unresolved.

**Table 1.3: An Example of LRE-Unresolved Recast during Peer Interaction**

| | | |
|---|---|---|
| A | : There are more stuff… is that stubborn? | Seeking clarification |
| B | : *Is like...* | Unresolved LREs |
| A | : Slow process? Stubborn is "guzhi" ar? | |

No recast is a phenomenon when there is an apparent linguistic problem in the interaction but no self-recast or other-recast towards the evident language issues discussed. As shown in Table 1.4, learner A was having difficulty to use a word to describe a situation of using phone to replace lecture notes, so he asked *how to say to say* to seek help from learner B. In this case, instead of providing recast to assist learner A to proceed with his ideas, learner B ignored learner A's question *how to say*, and simply answered *yea*. As a result, the linguistic problem faced by learner A was not provided with any recast at all.

**Table 1.4: An Example of No Recast during Peer Interaction**

| | |
|---|---|
| A | : No need to bring homework? Mobile phone eh, not the what.. |
| B | : No need to bring but still need to try in class then you can store in your phone la..hahaha anything |
| A | : What.. ? maybe need la, maybe if you didn't bring, you can… mm, *how to say?* Ah…like the replacement of notes la<br>*How to say*: lexical-based LRE |
| B | : *Yea*<br><*No recast* of the preceding utterance "*how to say*" because the speaker resolved the issue> |

At some point, LREs can be overlapped with the NoM's confirmation check as both dialogues has the meaning-focused elements. However, this study has distinguished the operationalization of confirmation check and LREs with recast clearly that the former is when learners' understanding is impeded by meaning whereas the latter is the discussion which

mainly focuses on the recast related to linguistic form, such as lexical-based or syntactic-based.

Some of the examples of LREs are as such, learner A says *cause distraction to others,* learner B says, *cause disturbance to others*, learners A then, says *disturbance ah? Disturbance and distraction, they are the same*. In these interactional occurrences produced by learners A and B, although it seems that they are negotiating the meaning of the vocabularies, *distraction* and *disturbance,* this is not considered as part of the NoM features because they did not seem to be misunderstood with the preceding utterance of their peer. The episodes discussed between learners A and B about *distraction* and *disturbance* in this case, is mainly related to lexical-based forms.

Based on the Interaction Hypothesis (Long, 1996; Pica, 1994), the communicative process seems to reveal a linear progression, during the peer interaction, the learners receives feedback and notices mismatch between their production and the target language. NoM is therefore pushed to progress the communication and enhance the understanding of the utterance, and then followed by the recast that focuses on linguistic features, to modify their own output (Swain, 1985).

### 1.2.2.3 Uptakes of Recasts

With regard to uptakes, Lyster and Ranta (1997, p. 49) describe uptake as "a student's utterance that immediately follows the teacher's feedback and that constitutes a reaction in some way to the teacher's intention to draw attention to some aspect of the student's initial utterance." The uptakes of recast is worth examining as Lightbown (1998, p. 193) asserts that, "a reformulated utterance from the learner gives some reason to believe that the

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mismatch between learner utterance and target utterance has been noticed, a step at least toward acquisition". Lyster and Ranta (1997), Sheern (2006), and Egi (2010) examined the effects of recasts based on the rate of learner uptakes. Loewen (2005) also proposed that learner uptakes is an indication of learners moving towards learning.

Based on the previous literature (Asari, 2015; DeKeyser, 2007) and the findings of available in this study, uptakes are categorised into several types, namely, modified uptake, unmodified uptake, merely acknowledgment or no uptake. The modified uptake is when the learner's immediate response followed the recast provided by their peers showed that it adopts part of the recast and expands on the part of recast provided.

As shown in Table 1.5, during the peer interaction, learner A could only think of the word, *shenzhe* meaning *promotion* in his L1, Chinese Mandarin, so, he uttered, *shenzhe* instead of *promotion*. Learner B noticed that there is a need to recast learner A's utterance, so he offered assistance by providing immediate input, the vocabulary, *promotion*. Learner A noticed the salient immediate input provided by his peer, so he uptook the recast and responded with the adoption of the recast offered by his friend and at the same time, modified the part of recast by expanding the vocabulary into a sentence form, *yea, higher chance to get promotion*. In this instance, this kind of uptake of recast is considered as the modified uptake of recast.

**Table 1.5: An Example of Modified Uptake of Recast during Peer Interaction**

| | | |
|---|---|---|
| A | : Faster catch up with the other | |
| B | : *Shen zhe* (promotion, in Chinese mandarin) | LREs- seeking help in Chinese mandarin |
| A | : Oh, ah….*promotion*? | Recast- Correctly Resolved |
| B | : Yea, *higher chance to get promotion*. That's why attitude is more important | Uptake of recast (lexical expanded to morphosyntax) modified |
| JX | : I agree, I agree. That should be different causes la | |

Concerning the unmodified uptake, it is a learner's immediate utterance followed the exact recast provided by their peers. It does not expand on the part of recast provided by others. As shown in Table 1.6, during the peer interaction, learner A was having difficulty to recall a word *confidence*, learner B noticed the difficulty faced by his peer, so he offered immediate input by uttering *confidence also*. Learner A noticed the salient immediate input provided by his peer, so he uptook the recast and responded with the adoption of the exact recast without any modification, *confident..confident yea and independent*.

**Table 1.6: An Example of Unmodified Uptake of Recast during Peer Interaction**

| | | |
|---|---|---|
| A | : Mm..indeed, become more independent.. and con.. con… | |
| B | : And confidence also.. | |
| A | : Confident.. confident yea and independent | <Unmodified uptake > |

With regard to the interactional feature of merely acknowledgment, it is the learner's immediate utterance followed by the recast provided by their peers, in which the utterance shows that he or she has noticed the recast, by merely acknowledging *yes*, *okay*, *right* without any modification. As shown in Table 1.7, during the peer interaction, learner A tried to clarify the meaning of *good grades* with learner B. Learner B provided recast by mentioning *it's like about good results*. However, instead of uptaking the recast by uttering *good results* or expanding the recast *good results* in a longer sentence structure, learner A merely acknowledged the recast provided by learner B, and uttered, *okay*.

**Table 1.7: An Example of Acknowledgement during Peer Interaction**

| | | |
|---|---|---|
| A | : good grades is like... *What do you interpret* as good grades? | clarification request |
| B | : It's like *about good results* | recast partially corrected |
| A | : *Okay..* | acknowledgment |

As for the phenomenon of no uptake, it is the situation when recast has been provided by a learner but no any response of uptaking the recast given by another learner. As shown in Table 1.8, during the peer interaction, learner A was trying to recall the three points, the first point recalled was *addicted*, however, learner B seemed to be uncertain of the point given by learner A and tried to confirm the point with learner A, and uttered *addicted* with rising intonation. However, instead of confirming the point he has given, he changed the word class, adjective, *addicted* to noun, *addiction*. In this case, the recast provided might not be the one that was sought by learner B, thus, learner B did not uptake the response given by learner A and moved on to another topic.

**Table 1.8: An Example of No Uptake during Peer Interaction**

| A | : what are the three points… addicted | |
|---|---|---|
| B | : *Addicted*? | Confirmation check |
| A | : Addiction. | Recast: just change the word class from adj to noun |
| B | : *Because of mobile phone, the need..* | No uptake |

Robinson (2001, 2003, 2005, 2007) predicts that learners tend to uptake more salient immediate input recast during the process of NoM. This is because peers salient immediate input can be effectively noticed by the learners since they are already aware of their mismatch between their production and native-like language form during the interaction. In the email exchange with Robinson (2016) (refer to Appendix B), he also maintains that uptake of recasts often occurs in confirmation checks of the NoM in the cognitively more complex tasks, as predicted by the Cognition Hypothesis, regardless of dyadic or triadic grouping condition.

The phenomenon of uptaking recasts is scarcely investigated from peer interaction perspectives. To validate the claims made by the Cognition Hypothesis, the study looked into

the quality of the different types of uptakes of recast in the peer interaction towards their peers' repairs, in different levels of task complexity (simple versus complex) as well as in different task conditions (dyadic and triadic groupings). With this, the relationship between the two dependent variables of this study, L2 individual writing and peer interaction was discussed in detail in Chapter 5.

### 1.2.3 English Language Education in the Malaysian context

Learners now had to participate in classroom activities that were based on a cooperative rather than individualistic approach to learning. Students had to become comfortable with listening to their peers in group work or pair work tasks, rather than relying on the teacher for a model.                                                   (Richards, 2006)

The shift of the educational paradigm has gradually prepared Malaysian learners of English as a Second Language (ESL) to be familiar with the use of tasks in the classroom as a means of learning English language. However, despite having immersed in an average of 15 years of ESL education in primary, secondary and tertiary educations, it seems that many Malaysian graduates are still being described as handicapped when seeking career advancement especially in this globalization era. One of the complaints refers to the deterioration of English proficiency in Malaysia since 1980s (Menon, 2017).

Possessing a strong command of English language not only does it affect one's communication skills in conveying messages, but also is vital to boost one's employability, especially in the private sectors (The Star Online, 5th March 2017). The concerns on whether Malaysian graduates and school-leavers have the English language proficiency levels that will enable them to compete in a globalised world are therefore; again, raised (Sani, 2018) and blames were put on the language teachers.

The history and the evolution of English language in Malaysian education system shows that English language is still in its unstable directions since the 1970s whereby English education policies are being experimented. Until today, it seems that the English education in Malaysia is still in its infancy stage with the back and forth implementation of monolingual (Malay language only) and bilingual (Malay and English languages) medium of instruction in schools. This boils down to the governmental control and the infusion of cultural politics over the decades (Pennycook, 1994; Vethamani, 2007).

The recent effort in addressing the decline of English proficiency proposed by the Higher Education Ministry in the Malaysia Education Blueprint 2015-2025 has shown some revamp of the Malaysia English Assessment (MEA). MEA has its two vital objectives, to increase ESL learners' English proficiency and to enhance their ability of using English language as a functional skill after graduation. In this case, increasing the use of tasks in a language classroom as a means to stimulate learners to interact with their peers in order to meet the functional demands. With the use of tasks that resemble real-world situation, hopefully it would develop holistic and balance graduates who are not only work-ready and competent in the subject matters, but are also able to utilize English as their functional skills that are comparable to the real world.

Thus, engaging L2 learners with various tasks and making them active participants to produce meaningful outcome that is as authentic as the real world is a matter of utmost importance. Ellis (2009) believes that tasks have the potential to induce learners to largely rely on their own resources when completing the activity and stretch the learners' current knowledge. Experiential learning beyond the classroom would cultivate a conducive learning environment for language learners to accomplish tasks that approximate real-life situations.

This requires not only their knowledge of English but also the appropriate use of the language within a given cultural and social context (Menon, 2017).

What seems to be more challenging in preparing the holistic and integrated environment is the task itself; whether or not during the task execution, the materials used are sufficient and contextualized to stimulate learners to use functional language in a meaningful and purposeful setting as these serve as an important platform to bring together all the sparks that boost learning. Until today, tasks are denoted differently by different scholars (Ellis, 2009; Nunan, 2004; Willis & Willis, 2008).

Regarding the preparation for the Malaysian ESL learners to face the real world, a concern should be placed on how the adoption of TBLT can fit in the tertiary institutes in Malaysia. Generally, tertiary institutes utilise the common modes of lesson delivery: lectures and tutorials in managing a large class. An instructed lecture is conducted for input and followed by tutorial sessions where activities are carried out with more detailed in pair or group discussions. To cultivate a conducive communicative learning environment, learners' task condition can be manipulated in terms of arranging number of learners during the peer discussion.

The use of Communicative Language Teaching (CLT) approach in university tutorials should encourage participation during the learning process, by engaging learners in their real-life communication. The sizes of classes in Malaysian schools are still large in average, normally around 40 learners, in contrast to classes in universities, at around 25 to 30. Possibly, active participation in university classes are more likely to happen than school classes. However, the CLT approach can be applied to Malaysian schools even with a big sized class if tasks are managed well from different aspects, for instance, task complexity and task condition.

In the Malaysian context, the phenomenon of using argumentative-based topics manipulated with the requirement to discuss causes and effects of an incident is commonly adopted as these topics elicit two-way interactive discussion in a language class. The tasks along this line are also considered higher-order thinking task, when learners not only need to understand, analyze, evaluate; but also produce explanation.

Based on the previous research (Rahimi, 2018; Revesz, 2007; Kuiken & Vedder, 2007, 2008, 2009), the tasks manipulated could hardly be adopted in the current study and in the Malaysian context due to the nature of the task that requires learners to allocate a big amount of fund, i.e. $ 500,000 for a project for different purposes. More empirical studies on various task aspects that can be contextualized in the Malaysian context are needed as tasks that are commonly used in the Western setting might not resonate in the Asian setting.

To effectively employ CLT in a language classroom to improve L2 learners' language competence, not only the facilitator and the learners are the main catalysts in reinforcing the language learning experience, but also the task-related features, such as the complexity levels of tasks, the learning environment and the authenticity of tasks. Tasks that are socially or culturally contextualized are able to induce them to use the target language in which will create more learning opportunities. Thus, this study adopted two variables that are real-life selected, task complexity and task condition to investigate to what extent the manipulation of these two features affect their L2 production, and if it is as predicted by Robinson. Thus, this study validates the Cognition Hypothesis by investigating the effects of task complexity *causal reasoning demands* and task conditions, number of participants in *peer groupings: individual, dyad* and *triad* on the individual L2 argumentative writing and peer interaction.

## 1.3 Purpose of the Study

The main objective of this research study is to investigate the effects of task complexity and task condition on L2 individual writing and peer interaction. Given the lack of empirical studies on the synergistic task variables, namely task design variable, *task complexity* and implementation variable, *task condition,* this study expanded the literature base through the lens of the aforementioned gaps by investigating the effects of task complexity, *-/+ causal reasoning demands* and task condition *-/+ number of participations* on the L2 individual written production. Additionally, this study also looked into the effects of the cross manipulation of task complexity and task condition on peer interaction.

## 1.4 Research Questions and Hypotheses

The following research questions are set to guide this study:

1. Is there a statistically significant effect of task complexity (simple vs complex task) and task condition (individual vs dyadic vs triadic grouping) on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency* in L2 individual writing?

$H_0$: The effects of task complexity and task condition (the number of participant in the interactional grouping) show no significant difference on L2 individual written production (CAF).

$H_a1$: The effects of task complexity and task condition show higher statistically significant difference on L2 individual written production (CAF).

$H_a2$: The effects of task complexity and task condition show lower statistically significant difference on L2 individual written production (CAF).

2. Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning (NoM), Language-Related Episodes (LREs) and Uptake on two task conditions (dyadic vs triadic grouping)?

$H_0$: The effects of task complexity and task condition (the number of participant in the interactional grouping) show no statistically significant difference on interactional features.

$H_a1$: The effects of task complexity and task condition show higher statistically significant difference on interactional features.

$H_a2$: The effects of task complexity and task condition show lower statistically significant difference on interactional features.

## 1.5 Operationalization of Variables

Three major variables are involved in the investigation of the effects of task complexity and task condition on the L2 individual writing and peer interaction, as shown in Figure 1.1.

| Dependent Variables (DVs) Continuous | Independent Variable (IV) + Moderator Variable ( MV) Categorical | |
|---|---|---|
| | Within-groups variable + | Between-groups variable |
| L2 Individual Writing<br><br>• Lexical and Syntactic Complexities<br>• Grammatical Accuracy<br>• Fluency<br><br>Peer Interaction<br><br>• Negotiation of Meaning<br>• Language-related Episodes<br>• Uptake of Recast | Within-groups variable (IV)<br><br>Task Complexity<br>• Simple (2 causes & 2 effects)<br>• Complex (6 causes & 6 effects) | Between-groups variable (MV)<br><br>Task Condition<br>• Individual (No discussion, individual writing)<br>• Dyadic (15 minutes discussion, individual writing)<br>• Triadic (15 minutes discussion, individual writing) |

**Figure 1.1: Design box for Variables**

*Note*. Adapted from Murphy (2004)

The construct of L2 learners' attention allotment in their cognitive system in the L2 individual written production, is operationalized as the global linguistics features, Complexity, Accuracy and Fluency (CAF). The learning opportunities in the peer interaction are operationalized as the interactional features like Negotiation of Meaning (NoM) along with its associated features, like comprehension checks, confirmation checks and clarification requests, Language-Related Episodes (LREs) as well as Uptakes of recast.

To analyse the outcome variables in Research Question 1, the L2 individual writings were coded for the global linguistic measures, CAF. The CAF obtained from the L2 individual writings of the first, individual session was set as baseline data and compared with the second and third sessions. The second and third sessions were set for dyadic and triadic peer interactions prior to their L2 individual writing.

To analyse the outcome variables in Research Question 2, the peer interactions were transcribed verbatim and then coded for the learning opportunities, such as NoMs, LREs and Uptakes of recast. The NoMs, LREs and Uptakes of recast obtained from the peer interactions of different participant groupings, in the second- dyadic and third-triadic sessions were then compared with one another in terms of the frequency of occurrence to investigate to what extent the different manipulation of task complexity and task condition affect the quality of peer interaction.

## 1.6 Significance of the Study

This study focused on task design and task implementation. Its findings could be informative for L2 teachers and syllabus designers when they devise appropriate pedagogies and choose suitable tasks for Malaysian ESL learners, especially in view that the purpose of English language teaching is to promote communicative language ability not only in the classroom but also to equip the learners to use the English language confidently outside the classroom. As predicted by the Cognition Hypothesis, tasks that are cognitively more demanding tend to push learners to produce higher accuracy of the L2 production. The design and implementation of tasks in this study are managed in the hope of meeting the expectations of two components of the MEA blueprint, that is, improve the language learners' English

proficiency and strengthen their ability to collaborate and work together in extracurricular activities.

The findings of this study shed light on the L2 task-based teaching and learning domains from the cognitive-interaction perspectives. The rationale of examining the effects of task complexity *causal reasoning demands* and task condition, *number of participants* on the learners' L2 individual written production and the learners' interaction is fourfold. Theoretically, as indicated in the Cognition Hypothesis, *task complexity* and the *number of participants* are two common phenomena in real-life language teaching and learning. Since learners are the direct subjects being conditioned by the facilitator in class to deal with the tasks, it is crucial to investigate and identify under what circumstances that the merge of the two would elicit attention to SLA for cognitive growth as well as the linguistics development, such as internalization and automatisation.

Another significant contribution is the data collection procedure employed in this study. By collecting the baseline data first, changes in both *L2 individual writing* (written data) and *interaction* (spontaneous spoken data) in the second and third sessions could be monitored and traced for any micro changes of the L2 written and spoken modalities to further understand the processing and development of a cognitive linguistic faculty. Moreover, the aforementioned variables are still underexplored variables; the findings of this study will contribute to L2 writing literature, which is currently underexplored in TBLT.

Lastly and practically, this study will also benefit researchers, task and syllabus designers, practitioners, as well as curricular policy makers, in the areas of a task design and pedagogy. This study hopes that the findings are able to bridge the theory and practice in the TBLT realm in order to inform classroom practice, which in turn benefits the policy makers, syllabus designers and practitioners in the education in terms of the curricula and effective pedagogy enhancement.

## 1.7 Definition for Glossary Terms

The following terms are used in this study. The definition of terms are presented as follows.

| | |
|---|---|
| Explicit knowledge | : It is knowledge that can be readily articulated, codified, stored and accessed. |
| Grammaticalisation | : A process by which a lexical item or construction changes into one that serves a grammatical function. |
| Implicit knowledge | : It is knowledge that is gained through incidental activities, or without awarenss that learning is occurring. |
| Internalisation | : A process of learning something and it can be used as the basis for production. An internalized language can be retained and retrieved when needed for communication. |
| Lexicalisation | : A process of adding words, set phrases, or word patterns to a language – that is, of adding items to a language's lexicon. |
| Syntacticisation | : It is the process where an interlanguage develops and becomes more grammatically complex is called syntacticisation or grammaticalisation. |

## 1.8 Summary

A general background of SLA and the issue related to task-based language teaching and learning in different contexts was presented in this chapter. Also, included in this chapter was a brief description of the potential task manipulation, from cognitive-interaction perspectives suggested by the Triadic Componential Framework of the Cognition Hypothesis. The research gap, the needs of understanding of the real-life needs of L2 learners the purpose of the study, research questions, and the significance of the study were illustrated as well.

Following this introductory chapter, Chapter Two provides an extensive review of literature pertaining to the development of task-based language teaching. It also discusses scholarly studies that focused on the effects of task complexity on L2 individual writing and peer interaction. A particular attention is accorded to the theory that underpins the entire study—the Cognition Hypothesis and its Triadic Componential Framework. Moreover, this

chapter provides a review and critique of previous studies on the global linguistics measures for L2 individual writing and the interactional features for peer interaction.

Chapter Three presents the research methodology. It explains the mixed methods research design adopted in this study. It provides a detailed explanation of the steps and procedures involved in data collection, data management and data analysis for each strand of this study. The chapter also describes the research instrument, research tools and the selection of the participants.

Chapter Four presents the results concerning the effects of task complexity and task condition on L2 individual writing and peer interaction. Each section of this chapter reports the qualitative findings on the effects of task complexity and task condition on L2 individual writing followed by the quantitative findings that reveal to what extent task complexity and task condition affect L2 individual writing. The next section presents the qualitative findings concerning the effects of task complexity and task condition on peer interaction and proceeds to provide quantitative findings on the effects of task complexity and task condition on peer interaction.

In Chapter Five, results of L2 individual writing and peer interaction are discussed in the light of the Cognition Hypothesis and from cognitive-interaction perspectives. These findings shed light on the L2 task-based teaching and learning domains from the cognitive-interaction perspectives, in particular the relative roles of simple versus complex tasks and individual, dyadic or triadic conditions on written and spoken production.

Chapter Six provides the overview of this thesis. It summarizes and synthesizes the findings from the qualitative and quantitative strands of the analysis. Then, it draws conclusions from these findings. It also highlights contributions and limitations of this study and gives recommendations for future research pertaining to TBLT. This chapter concludes with a discussion of the pedagogical implications of the findings.

## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

Language learning is a psycholinguistic process, by which learners acquire the body of knowledge of linguistic features to perceive and comprehend language as well as to produce words and sentences to exchange information. In a formal instructional setting, language learning and teaching are a dynamic interface, which cannot be neatly separated. However, it does not always represent a recursive or two-way process. Without the need of learning, teaching might not be demanded however, without teaching, learning might still take place.

Although some L2 theories argued that children acquire while adults learn, the acquisition-learning hypothesis and some studies show that adults also acquire a language to a certain extent (Krashen, 2009), only that adult L2 learners could hardly achieve native-like proficiency levels since the acquisition of implicit knowledge is typically limited in the adult acquisition of L2. This suggests that young adults of the second language acquisition (SLA) can learn the target language better with explicit knowledge (Ellis, 2008).

To develop explicit knowledge in the formal instructional SLA setting, class tasks are usually designed to cater for intentional language learning which creates the opportunity for language learning. Studies have shown that some class tasks can be designed and implemented to cater for intentional and incidental learning. Incidental and intentional language learning and teaching facilitate language learning with the notice of explicit knowledge gained from the salient linguistic features for the L2 learners to notice that enhances their process of language acquisition (Schmidt, 1990). Ellis (1997) suggests that

explicit knowledge helps learners to notice linguistics features that might otherwise be ignored. Also, explicit knowledge is likely to facilitate the process of noticing the gap of knowledge (Ellis, 1997).

Intentional learning could be derived from any feature-focused activities (Ellis, 1997) apart from explicit teaching of overt grammar rules. Explicit knowledge is not limited to only formal classroom setting with over syllabus revealed to the learners, rather explicit knowledge can be developed through incidental learning environment, be it formal or informal. In other words, language learning and teaching can happen freely, even in a non-linguistic context if tasks are well designed that engage L2 learners in an active communication.

A communicative platform promotes learning opportunities for attentional mechanism to capture the explicit knowledge in an incidental learning manner. Earlier studies such as those of Donato (1994), Foster (1998), Fujii and Mackey (2009), Gass, Mackey and Ross-Feldman (2005), LaPierre (1994), Newton (1991), Pica (2002), Pica and Doughty (1985a), (1985b), Swain (1998), Swain and Lapkin (1998) suggest that peer interaction stimulated by communicative tasks produces features such as negotiation of meaning and language-related episodes. Interactional features such as negotiation of meaning are claimed to be conducive for the enhancement of second language acquisition (Pica et al., 1993) as L2 learners switch their attention from focus on meaning to focus on linguistics form.

## 2.2 Task-based Language Teaching (TBLT)

### 2.2.1 The Development of TBLT

Task-based language teaching (TBLT) is a language teaching approach that stems from Communicative Language Teaching (CLT) approach advocated in 1960s. CLT can be traced back to the Communicative Approach in which the teaching is conducted through communicative tasks. CLT is a language teaching approach that concerns interaction as both the means and ultimate goal of study. This communicative approach expanded from sociolinguistic in the 1970s in which there is more communication than just grammar and vocabulary.

Task-based Language Teaching (TBLT) was then advocated by Prabhu (1987) as an approach to language teaching which focuses on the use of tasks as a means to induce learners to communicate with peers using the authentic language during the process of completing the task in the classroom. It is a language learning and teaching method that takes in language use as an aid to language acquisition upon task completion. This is because communication involves the ability to make one and another understand in socially appropriate ways. It emphasizes on the idea that learning language successfully through communicating meaningful ideas that are closely related to real-world situation.

In the TBLT field, generally, the use of authentic target language is encouraged by involving students to use English language in completing the tasks to help them to reach the noticing stage of their knowledge. Tasks that are defined in CLT and TBLT contexts can be ranged from everyday life, such as visiting doctors, buying groceries or talking to our friends on particular issues (Nunan, 2003). The task framework employed in this context is primarily in accordance with Ellis (2003) and Willis and Willis (2008) task concept, in which it requires

L2 learners to focus on meaning and relates to real world, there is a gap to induce learners' interest, there is a clear outcome and completion is their priority.

### 2.2.2 Definition of Tasks

In SLA field, the notion of *task*, has obtained its considerable attention from language practitioners and researchers since the past three decades. Task, has been given its own definitions from multiple perspectives: real-world points of view and task-based instruction.

In the 1980s, the TBLT scholars like Long (1985, p.89) defines tasks from real-world point of views that:

> A piece of work undertaken for oneself or for others, freely or for some reward. Thus, examples of task include painting a fence, making an airline reservation, borrowing a library book, taking a driving test, typing a letter, weighing a patient, sorting letters, taking a hotel reservation, writing a cheque, finding a street destination and helping someone across a road.

That is to say, task, can be defined as any work under the sun that people do in everyday life, at work, at play and in between. Task are the things people will tell one they do if one asks them. These people are not applied linguistics.

However, Crookes (1986b, p.32) from a major cross-disciplinary review suggests that:

> It has been shown that the category 'task', as used by researchers generally, is widely applicable and has psychological reality. Much, if not most, of human activity, whether in employment or in the classroom can be seen a series of tasks- some having a communicative aspect, others not.

Like Hutchinson & Waters (1987) and Swales (1990), Crookes (1986b) opines that task is the central of methodology. He further argues that language teachers prepare tasks without reflecting upon the pragmatics of their classrooms. He comments that the nature of

tasks and the arrangements of implementing the tasks in the classroom are among the classroom practices that embedded in the methodology.

Breen also gave a general definition (1987, p. 23) to describe what task is and how task should look like:

> The notion of 'task' is used in a broad sense to refer to any structural language learning endeavor which has a particular objective, appropriate content, a specified working procedure, and a range of outcomes for those who undertake the task. 'Task' is therefore assumed to refer to a range of workplans which have the overall purpose of facilitating language learning- from simple and brief exercise type to more complex and lengthy activities such as group problem-solving simulations and decision-making.

Edge and Samuda (1981), Samuda and Madden (1985) and Hutchinson and Waters (1987) add to Breen's definition that a task-based task serves as a means to facilitate language learning process, thus learning should not be seen as an end in the task itself.

From pedagogical perspectives, Candlin (1987, p.10) states that:

> Sequenceable problem-posing activities involving learners and teachers in some joint section from a range of varied cognitive and communicative procedures applied to existing and new knowledge in the collective exploration and pursuance of foreseen or emergent goals within a social milieu.

Hutchinson and Waters (1987, p. 117) defined tasks as "have beginnings, middles and ends to provide an orientation for learners against the often opaque background of a course syllabus: in addition they provide objectives for learners and establish "landmarks of achievement". In the view of the earlier TBLT scholars, task is "sequenceable" both in practice and theory (Swales, 1990).

Skehan (1998) seems to provide a more comprehensive definition of task, that is:

> A task is an activity in which meaning is primary; there is some kind of communication problem to solve; there is some sort of relationship to comparable

real-world activities; task completion has some priority; the assessment of the task is in terms of outcome.

Task, in this case, supports learners to experience language as a living entity through using it to practice doing the tasks in order to achieve functional demands. Bygate (2001) points out that for research, task may have static, controllable nature and as for teaching purposes, they may include more dynamic and extended qualities. Among all the definitions given, the core traits of tasks seem to show that having a meaningful purpose that stimulates learners' interest to complete the task using the target and authentic language is the ultimate goal of a task.

In simpler ways, Ellis (2007) defines task with four major characteristics. Firstly, a task should have a primary focus meaning. Secondly, a task should have a gap, be it information gap, opinion gap or reasoning gap. Thirdly, a task should have learners to use language to complete the task. Lastly, a task should have a defined outcome.

Based on the review of literature, it seems that there are two types of tasks, namely real-world task and pedagogical task. Real-world task being the everyday activity ranging from the moment a person wakes up until going to bed. Pedagogical task has always been argued as superficial task, which attempts to approximate the real-world task. The language classroom in the Malaysian context commonly adopts argumentative-based topics as the nature of the task for L2 speaking and writing, that is because the causal reasoning demands inherent in the argumentative-based topics tend to stimulate learners to perform an in-depth cognitive process. For instance, they are usually required to understand, analyse, evaluate and explain. These higher-order cognitive processes nudge the learners to produce two-way interactive discussion among themselves.

In the recent TBLT conference that focused on insight, instruction and outcome, East (2019) argues that most favourable research findings are not necessarily favourable in informing the classroom practice. Therefore, the TBLT approach is still considered a contested endeavor after decades. One of the challenges encountered by language practitioners could be the fuzziness of the notion of task (Richards, 2006), for that reason, "numerous interpretations and orientations to the concept of TBLT" (Nunan, 2004, p.14) remains.

As Long (2015) has recently distinguished the notions of task adopted as part of the methodology with the capitalisations of TBLT and tblt in which are briefly discussed in the following sub-sections in accordance with the concept differentiated with TBLT and tblt respectively. Long (2016, p. 28) asserts that, TBLT is "still a relatively recent innovation-one whose adoption requires expertise."

### 2.2.2.1 TBLT

The upper case of TBLT was proposed by Long (1985) as cited in Long (2015) that task, is any real-world activities people could think of when planning, conducting or recalling their day. The use of tasks in TBLT is an analytical approach in hopes that a task would fulfill the diverse psycholinguistic and communicative needs of L2 learners. As for its authentic-like feature as the task nature, the approximation of the real-world elements should be transferable from classroom to beyond classroom, in which the knowledge learned in the classroom is applicable outside the classroom.

It seems that the upper case TBLT is closely related to an analytical approach, as proposed by Wilkins (1974), that tasks accomplish the communicative skills of learners in which the language samples used during the task completion can be freely modified in many

different ways with different sentence structures and lexis. However, if very little focus is placed on the linguistic features, in this case, such kind of task might seem to be inefficient and ineffective in treating, especially the adult or low proficiency L2 learners who regularly commit grammatical errors.

### 2.2.2.2 tblt

As critiqued by Long (2015), tasks used in the lower case of tblt are usually very least or almost not related to learners' real-world activities. As mentioned by Fotos and Ellis (1991), task has been designed to practice structures, functions or sub-skills in a traditional grammatical, notional-functional, or skills-based syllabus delivered using linguistically simplified materials, with classroom methodology to match. For instance, a role play about job interview might look like a well-fitted task-based task, however, the chosen focus for practicing question and answer forms, as Skehan, the advocate of genuine TBLT calls it as a structure-trapping task. As for Ellis (1997), he labels such a task as a consciousness-raising task, and later Ellis (2003) calls it as task-supported, also known as focused task or Presentation, Production and Practice teaching approach. The overall notion of the task in the lower case tblt seems to force the learners' attention to the practice of structures, grammar, vocabulary, in order to meet the linguistic needs of a unit. Tasks in the lower case—tblt—also propose that learners should practice certain structures, functions or sub-skills in order to achieve the end product of the task.

It seems that the lower case tblt task generally emphasizes overt and covert linguistic grammatical syllabus without placing much focus on the (pragmatics) meaning of the task. In this case, the lower case tblt task seems to be a synthetic approach, as proposed by Wilkins (1974), in which he criticizes that synthetic syllabus design usually has language structures and functions separated. That is to say, when the time comes for communicative purposes,

then learners will be asked to integrate the structures and functions. This is being criticized to be not compatible with the natural language learning process.

### 2.2.2.3 The Equilibrium between TBLT and tblt

Based on the argument made on the notions of TBLT and tblt, it seems that the TBLT analytical syllabus which purely focuses on meaning tend to fail to bring the learners to attend to persistent linguistic errors. In this case, it does not seem to benefit the L2 development, especially if the L2 learners are the adults whose capacity for the incidental learning is not stronger than a child is. As for the tblt synthetic syllabus, it purely focuses on the grammatical curriculum and ignores the meaningful context that might hardly be applicable to the real world situation.

Instead of treating analytical and synthetic syllabus dichotomy as a binary opposition, as Long and Crookes (1992) proclaim the two should be treated as a continuum to complement the learning process. Ellis (2015) also suggests that the use of task in the contemporary language teaching approach should not be replacing the traditional teaching methods but use alongside them. Thus, seeking the equilibrium of TBLT and tblt is vital to enrich the learning experience of the L2 learners for longer information retention.

As inspired by Long (2015), a balanced TBLT and tblt task can be designed in such a way to condition learners to use the target and authentic language to interact in order to complete the task. During the interaction, any communication breakdown enables the shift of the learners' attention from focus on meaning (content) to focus on form (language), in order to progress with the communication and continue to convey ideas. During the communication impasse, learners tend to focus more on resolving problems related to the linguistics features, such as providing negative feedback to their peers. This gives

opportunities for intentional learning to speed up the learning process and supplement adult learners with intentional learning since the mismatch between their current knowledge and their incapability has brought to their attention. The noticing stage enables the learners to stretch their interlanguage system more effectively.

Therefore, a balance between TBLT and tblt should be that of using a meaningful task, which will condition learners to use authentic language to communicate in order to convey their meaning, and through interaction, it enables them to notice the gap between their existing knowledge and their inability to use certain language forms to convey the meaning. With this, it helps learners to shift their attention to focus on meaning and to focus on form.

Not only that the learners who encounter difficulty during the interaction will stretch their interlanguage system in order to meet the functional and communicative demands, their peers who notice the difficulty will also attempt to provide recast to assist the interaction proceed. In this case, when immediate input is provided, the learners who initially have linguistic difficulty to express themselves will then learn the language intentionally. This helps the learners to retain the information much longer in their memory resources as this is part of their real experiences.

## 2.3 Attention, Cognitive System, Consciousness and Second Language Acquisition (SLA)

Attentional mechanisms and memory resources are both vital for the L2 acquisition as these cognitive processes play a role in assisting learners' mental processing, such as noticing, encoding language input and retaining information (Robinson, 1995; 2003a). The

process of SLA such as language comprehension, production and acquisition involves the psycholinguistic processes to acquire, utilize, comprehend and produce language.

Attention is critical in two aspects (Doughty 2001, Robinson 1995a, Schmidt 1995, 2001), that is, it is prerequisite for noticing and it improves the efficiency of implicit input processing at the lower level of apperception or detection. According to Robinson (2003), an L2 learner's attention results from the detection of mismatch and salient immediate input, the noticing stage that facilitates L2 learners to shift their attention, from focus on meaning to focus on form enable them to retain information much longer and more effectively.

The attention to output acts as facilitating role for learners to notice what they want to say and what they are able to say. According to Robinson, Mackey, Gass and Schmidt (2012), producing output also offers learning opportunities for testing hypothesis for meta-linguistics reflection on the L2 linguistic form. It leads L2 learners to be aware of what they do not know or what they know partially. The notion of learners being aware of what they have learned is stemmed from the cognitive psychology field (Ellis, 2008). Cognitive psychologists labelled the unconscious learning as implicit learning in which learners remain unaware of the learning has taken place, thus, they cannot verbalise what they have learned; whereas for the explicit learning, it is a conscious learning and learners can verbalise what they have learned (Jimenez, 2003; Reber, 1976; Kinder et al., 2003; Wallach & Lebierre, 2003).

In SLA, some view that implicit and explicit knowledge as two independent learning entities (Krashen, 1981) while some condemn the differentiation of implicit and explicit learning and further question the notion of consciousness and its appropriacy as a descriptor for mental activity in the SLA (McLaughlin, 1990). However, Schmidt (1990, 1994, 2001) prove the effectiveness of using the notion of consciousness as a construct by thoroughly

deconstructing the notion into several meanings. Overall, Schmidt (1990, 1994, 2001) differentiates consciousness from four aspects, namely, intentionality (incidental versus intentional learning), attention (i.e. attended versus unattended learning), awareness (implicit versus explicit learning) and control (automatic versus controlled processing).

Ellis (1994) affirms the distinction between implicit and explicit learning in the fields of SLA and cognitive psychology. Although Ellis (2009) who acknowledged the doubts of the legitimacy of the dual learning systems: implicit and explicit, at the same time; he adopts the arguments by Ellis and Schmidt on the existing of the dual learning systems. Following Schmidt (1994, p.20), Ellis (2009) further defines implicit and explicit learning as well as implicit and explicit knowledge as 'related but distinct concepts that need to be separated'. He refers the former as the *processes* involved in learning, whereas the latter as the *products* of learning.

In the review of the notions of implicit and explicit knowledge pertaining to SLA, Ellis (2009) opines that implicit knowledge is tacit as L2 learners might intuitively know that a sentence is ill-formed without stating the grammar rule that is being violated. Explicit knowledge is conscious as L2 learners are able to verbalise the grammar rule, which the ill-formed sentence has violated. He also suggests that implicit knowledge is procedural whereas explicit knowledge is declarative. However, the procedural rules of the implicit knowledge might not be target-like whereas the declarative knowledge are often inaccurate and not precise (Ellis, 2009).

Lantolf (2000) views implicit knowledge as the fully internalized knowledge by a learner whereas explicit knowledge is viewed as a tool to assist learners to mediate their performance in order to achieve self-control in a linguistically challenging condition. Another difference between implicit knowledge and explicit knowledge is that the former

can be observed from the learners' verbal behaviour, which is the actual language use whereas the latter shows that learners can verbalise or state the underlying grammar rules technically with meta-language components or use non-technical language to describe a grammar rule.

Although Birdsong (2006) asserted that implicit knowledge deficits when a learner ages, in contrast, Bialystok (1994, p. 566) suggested that "explicit knowledge can be learned at any age", depending on an individual differences to memorise, induce or deduce the explicit knowledge about a language (Ellis, 2006). It seems that the argument pertaining to the implicit and explicit learning and knowledge are dichotomous and distinct remains debatable as sometimes, the L2 performance demonstrates an amalgam of implicit and explicit knowledge of the L2 learners when processing the same linguistic features.

Ellis (2005) claims that the general principle of explicit learning in SLA is changing the cues that learners focus on, in their language processing, changes what their implicit learning processes tune. Explicit learning, or intentional learning is usually with awareness of the learning and it enhances the implicit processing of the subsequent exemplars of the L2 production. For instance, when a learner's attention is drawn to problems, or switch attention from meaning to form (Faerch and Kasper, 1986; White, 1987), followed by the provision of new information, they would notice (Schmidt, 1990) what is salient or what is held and processed in the short-term or working memory.

After the processing of the short-term and working memory, learners then compared with what is available in the storage of the long-term memory. Eventually, the sub-set of input becomes the intake of knowledge. The three core issues brought up by Robinson, Mackey, Gass and Schmidt (2012) in the SLA field, that is, firstly, the interface between implicit and explicit knowledge; secondly the objects of attention; and lastly the role of

attention to and awareness of output. As argued by Ellis (2009), among the major sources of debate in the SLA field pertaining to implicit and explicit learning and knowledge, the controversy will remain unless consistent instruments for determining whether what learners have learned as a result of instruction or exposure, entails implicit or explicit knowledge, or the amalgam of the two.

It is claimed that declarative knowledge result from explicit learning can be transformed into procedural knowledge. These types of interface are non-interface, strong interface and weak interface positions. The non-interface position is the phenomenon when implicit and explicit L2 knowledge contain different acquisitional mechanisms (Hulstijn, 2002; Krashen, 1981) in which explicit knowledge can never transform directly into implicit knowledge while implicit knowledge can never become explicit. As for the strong interface position, it is claimed that explicit knowledge is derived from implicit knowledge, and it can be transformed into implicit knowledge through practice. With regard to the weak interface position, explicit knowledge can become implicit but with some restraint, as in when or how it can take place.

Through practice, explicit knowledge can become implicit knowledge provided that L2 learners are developmentally ready to advance according to Pienemann's processability theory (Pienemann, 1999). Another weak interface posits that implicit and explicit learning work together in SLA, and since they are dynamic and occur consciously, however, the effects on the implicit learning takes place only transiently (Ellis 1994, 2008; Ellis, 1993, 2008). The last weak interface position is when learners use their explicit knowledge to produce output to their implicit learning mechanisms (Schmidt & Frota, 1986; Sharwood Smith, 1981).

Ellis (2005, 2008) suggested that there are three interactions between implicit and explicit knowledge. Firstly, implicit knowledge is evident during the fluent language production whereas explicit knowledge is developed through conscious efforts to construct meaning. Thirdly, learners tend to use explicit knowledge to subsidize the failure of their implicit knowledge.

## 2.4 The Cognition Hypothesis and Triadic Componential Framework

The Cognition Hypothesis claims are made based on the premises that an individual possesses multiple pools of memory resources (Robinson, 2001, 2003, 2005, 2007; Wickenw, 2008). Therefore, when learners attend to complex tasks that require more of their mental resources for linguistics features, such as accuracy and complexity, learners have sufficient capacity of mental resources to process the information, encode the language and retrieve from their resources. According to Robinson (2001, 2003), pedagogic tasks should be sequenced on the basis of the principle of natural complexity progression, from simple to complex in order to approximate the complexity of real-world tasks.

The fundamental assertion of the Cognition Hypothesis is that task complexity affects language production, on the accuracy, lexical and syntactic complexity of the L2 production. Robinson (2001, 2003, 2005) claims that increasing the functional or cognitive demands of tasks affects the way L2 production is syntacticised (Givon, 1985; 1995; 2002). Cognitively more demanding tasks also push the language development of L2 learners beyond their current level of interlanguage (Klein & Perdue, 1992; 1997).

This assertion was based on Givon's (1985) claim that "greater structural complexity tends to accompany greater functional complexity in syntax" (p. 1021) and Perdue's (1993a)

claims that "acquisition is pushed by the communicative tasks of the discourse activities which the learner takes part in" (p.53). Following Rohdenburg (2002), Robinson (1995a; 2001b) further claims that the more explicit lexico-grammatical learning opportunities will tend to be preferred in cognitively more complex environments and such phenomenon result from complex oral task performance manipulated with the cognitive resource-directing dimensions as shown in  Table 2.1 adopted from Robinson (2003).

**Table 2.1: Task complexity and monologic/ interactive task production along resource-directing dimensions**

|  |  |
|---|---|
| **Monologic tasks** | |
| **Simple** | **Complex** |
| + fluency, - complexity, -accuracy | - fluency, + accuracy, + complexity |
| **Interactive tasks** | |
| **Simple** | **Complex** |
| + fluency, - accuracy, | - fluency, + accuracy, |
| -  Comprehension checks/ | + comprehension checks/ |
| -  Clarification requests | + clarification requests |

*Note*. Adopted from Robinson (2003).

In the task-based language instructional setting, the Cognition Hypothesis proposes that class tasks be designed and sequenced from cognitively simpler to more complex to approximate the demands of real-world tasks (Robinson, 1996, 2001, 2003b, 2005a, 2007a). It is believed that pedagogic tasks can be designed and simulated to promote automatisation of and smooth access to the existing L2 interlanguage knowledge of L2 learners in order to accomplish task demands. With this, it stretches and develops the L2 learners' current interlanguage knowledge.

The Cognition Hypothesis postulates the relationship between cognitive complexity inherent in a task as well as learners' cognitive processing for L2 production and development (Robinson, 2003b, 2005, 2007b). Learners' attentional mechanisms and memory resources

need to be stimulated with task complexity for SLA as these cognitive processes assist

learners to notice and encode linguistic input in working, short-term and long-term memories

(Robinson, 1995, 2003a). As shown in Table 2.2, according to Robinson, a task can be

designed cognitively more complex by manipulating the elements of resource-directing

variables such as increasing *causal reasoning demands* whereas a simpler task can be

manipulated by increasing the resource-dispersing variables such as *planning time*.

**Table 2.2: The Triadic Componential Framework for task classification – categories, criteria, analytic procedures, and design characteristics**

| Task Complexity (Cognitive factors) | Task Condition (Interactive factors) | Task Difficulty (Learner factors) |
|---|---|---|
| (Classification criteria: cognitive demands) | (Classification criteria: interactional demands) | (Classification criteria: ability requirements) |
| (Classification procedure: information-theoretic analyses) | (Classification procedure: behavior-descriptive analyses) | (Classification procedure: ability assessment analyses) |
| (a) Resource-directing variables making cognitive/conceptual demands | (a) Participation variables making interactional demands | (a) Ability variables and task-relevant resource differentials |
| +/− here and now | +/− open solution | h/l working memory |
| +/− few elements | +/− one-way flow | h/l reasoning |
| −/+ spatial reasoning | +/− convergent solution | h/l task-switching |
| −/+ causal reasoning | +/− few participants | h/l aptitude |
| −/+ intentional reasoning | +/− few contributions needed | h/l field independence |
| −/+ perspective-taking | +/− negotiation not needed | h/l mind/intention-reading |
| (b) Resource-dispersing variables making performative/procedural demands | (b) Participant variables making interactant demands | (b) Affective variables and task-relevant state-trait differentials |
| +/− planning time | +/− same proficiency | h/l openness to experience |
| +/− single task | +/− same gender | h/l control of emotion |
| +/− task structure | +/− familiar | h/l task motivation |
| +/− few steps | +/− shared content knowledge | h/l processing anxiety |
| +/− independency of steps | +/− equal status and role | h/l willingness to communicate |
| +/− prior knowledge | +/− shared cultural knowledge | h/l self-efficacy |

*Note:* Adopted from Robinson (2007a).

The model of the Cognition Hypothesis, the Triadic Componential Framework

presents the three task dimensions, task complexity, task condition and task difficulty with

feasible variables for each of the task design, task implementation and task sequence for pedagogical tasks. According to Robinson (2001, 2003, 2005, 2007), task complexity dimension is the only task dimension which can be manipulated to increase or decrease the cognitively complexity of a task which affect the cognitive processing of L2 learners in their L2 production, performance and development.

### 2.4.1 Task Complexity

Task complexity is claimed to be the major basis for proactive pedagogic task sequencing and task design (Robinson, 2001, 2003, 2005, 2007). Task complexity is one of the task dimensions as shown in the Triadic Componential Framework in which it is the cognitively complexity inherited in a task and it can be manipulated by increasing the resource-directing continuum, such as causal reasoning demands or by decreasing the resource-dispersing continuum, such as planning time in the task complexity dimension.

When a task is made cognitively more complex, learners are predicted to produce higher amount of interaction. With that, learners will stretch their attentional, memory, reasoning and other information processing resources in order to meet the functional and communicative demands (Robinson, 2001b, 2003b, 2005, 2007b). Increasing cognitive complexity of a task enables learners to produce a wide range of vocabulary and sentence structures (lexical and syntactical complexities). At the same time, a complex task will also drive learners to pay attention to the language features and produce higher grammatical accuracy (Robinson, 2003b).

In addition, a cognitively more complex task will elicit learners to engage in a greater amount of interaction (Robinson, 2003b). This conversational phenomenon assists the

process of promoting linguistic awareness in L2 learners. During the interactive discussion, communication breakdowns tend to occur (Robinson, 2003b). To solve the conversational problems, learners will produce interactional moves, such as NoM, which includes comprehension checks, confirmation checks and clarification requests (Long, 1981; Long, 1990; Robinson, 2003b, 2005) as well as LREs (Swain & Lapkin, 1998) which include, recast (Robinson, 2003b) and (*self-/ other-*) repairs (Kormos, 1999).

Robinson (2003b) suggested that the event of producing interactional episodes creates the condition for learners to notice their own as well as others' gaps. In the processing and production stages, these interactional moves will prime learners to take up any available input that is made noticeable by the interlocutors. The saliency, noticing and uptake of input resultant from the interaction will in turn facilitate attentional mechanisms to develop access to the existing L2 knowledge and interlanguage system (Robinson, 2003b).

In accordance with the concepts of having multiple pools of attentional resources in the brain structures (Allport, 1987; Wickens, 2008; Wickens & McCarley, 2007), Robinson also proposes that L2 learners can equally attend to form (linguistic) and meaning (content) at no expense of L2 accuracy and complexity. This is due to the sufficient capacity in the multiple pools of attentional resources to process (store and retrieve) the linguistic aspects (Robinson, 2001a, 2001b, 2005).

It is important to note at this juncture that a complete contrast to Robinson's Cognition Hypothesis is Skehan's Trade-off Hypothesis and its Limited Attentional Capacity (LAC) Model. It proposes that our mental condition possesses a limited pool of attentional and cognitive resources (Skehan, 1998). According to Skehan (1998), in most circumstances, the aspect of content, which is meaning, is prioritized before linguistic features, which is the form. As a result, a division of attention would occur. In this case, if the task demands exceed

the available existing resources, the linguistics performance areas, linguistic complexity, accuracy and fluency would compete among themselves in the remaining pool of attentional capacity. With this reason, either accuracy or complexity of the L2 output which receives sufficient attention will produce optimal performance whereas the limited remaining area will be sacrificed. This is due to attending to one linguistic aspect might cause the neglect of others (Skehan & Foster, 1997).

### 2.4.2 Task Condition

Task conditions concern how information flows through learners' participation in the classroom and the grouping of participants (Robinson, 2003). Two categories of task characteristics are stated that each might affect the nature and amount of interaction between participants when performing tasks during task implementation (Robinson, 2015). Robinson suggested that task condition should be designed based on the behavioral needs analysis of learners and then it should be held constant with the increase of cognitive complexity of the tasks. The objective of replicating the interactive demands and iterating the pedagogic task conditions with task complexity from simple to complex is to trigger the memory of learners. It is believed that such a task design leads to rehearsal and elaboration of the scripts and schemata for interactive task performance the task requires.

Task conditions that focus on the interactive demands during the task performance, like the participation factors, depict the interactional demands, predict the extent to which each manipulation of variable is capable of acting on or influencing each other. As for the participant factors, the interactant demands are the characteristics embedded in each participant, such as gender or proficiency and are believed to affect each other (Plough &

Gass, 1993; Yule & MacDonald, 1990 as cited in Robinson, 2015). The former can be operated with grouping learners in pairs of groups whereas the latter can be arranged in a homogenous or heterogeneous grouping.

According to Robinson (2003), task condition variables can be used as an advanced diagnostic tool considered by task-based practitioners during task design (Pica, Kanagy, & Falodun, 1993; Robinson, 2003). In line with task complexity sequencing principles, the manipulation of task complexity in the task condition in this study adheres to the natural task complexity progression, in which the task complexity from simple to complex was held constant in each condition of individual, dyadic and triadic. Long (1998), as cited in Robinson (2007) asserts that the choice of task conditions should be determined by the identification made in the needs analysis, however Robinson (2003) argued that task condition should be specified as a priori, and be held constant each time progressively more cognitively complex versions are attempted in L2 classrooms.

The fundamental proposal made by the Cognition Hypothesis is that increasing task complexity also increases the language production, in terms of grammatical accuracy, lexical and syntactic complexities but not fluency. The participation factor that was manipulated in this study is the *number of participants* in which it was designed with three task conditions: individual, dyadic and triadic while the participant factor was controlled.

As for grammatical accuracy, Robinson (2003) argues that gradually increasing the cognitive complexity of L2 tasks along the conceptual and functional demands draws learners' attention to the differences of L1 and L2 grammatical notions (Talmy, 2000), from the concept-structuring function of closed-class items in the L2 versus the L2, and leads to gains in accurate grammaticisation.

Given the premises that each learner has multiple pools of resources for cognitive processing, more participants involved in a task might signify more memory resources available and thus, the attentional mechanism from different mental resources of participants are pooled as compared to fewer participants with fewer availability of memory resources and attentional mechanism.

Therefore, when a cognitively more complex task is performed by more participants, a more accurate and complex linguistics features should be produced by L2 learners as compared to a simpler task taken by fewer participants. At the same time, more interaction should also be elicited and more apparent noticing of linguistic features via interactional feedback should also be observed. The following sections discuss the global linguistics measure, complexity, accuracy and fluency (CAF) that have been commonly adopted by language practitioners and researchers to assess learner's L2 language performance, production, proficiency and development.

## 2.5 Global Linguistic Measures: Complexity, Accuracy and Fluency (CAF)

L2 practitioners and SLA researchers note that L2 proficiency is not a unitary construct. Due to its multi-componential nature, the linguistics measurements: complexity, accuracy and fluency (CAF) have been globally used to assess the L2 production, performance, proficiency and development in the L2 instructional and research settings.

In the L2 context, CAF was first used in the research studies in 1970s when L2 researchers took up the measurements of grammatical accuracy and complexity from the L1 acquisition research like Brown (1973) and Hunt (1965) as cited in Housen et al. (2012). Fluency and accuracy were later used to investigate communicative L2 proficiency in

classroom contexts like studies of those Brumfit (1979, 1984), and Hammerly (1991). In the 1990s, Skehan (1996, 1998) presented a proficiency model with the triad CAF components being brought together. Since then, they are being used as a constructs to represent attention allotment until today.

In the L2 research, the constructs of CAF are mainly used as dependent variables to investigate the effects of task features, learning context, individual differences and instruction on the learners' performance (Bygate, 1996; 1999; Collentine, 2004; De Graaff, 1997; Derwing & Rossiter, 2003; Foster & Skehan, 1996; Fotos, 1993; Freed, 1995; Housen et al. 2012; Norris & Ortega, 2000; Robinson, 2011; Yuan & Ellis, 2003).

Empirical studies have shown that complexity, accuracy and fluency are competing areas and have to be considered to claim about learners' L2 performance and proficiency (Norris & Ortega 2009; Ortega 1997; Skehan & Foster 1997, 2011).

Theoretically, CAF have been claimed to imply three major changes in the L2 system. Firstly, the internalization or greater complexity of new L2 elements occurs when more elaborated and sophisticated L2 knowledge systems are developed. Secondly, the modification of L2 knowledge occurs as learners restructure and fine-tune their L2 knowledge, including the deviant or non-target-like aspects of their interlanguage, so that they exome not only more complex but also more accurate L2 users. Thirdly, the consolidation and proceduralisation of L2 knowledge, which is higher fluency, through routinisation, lexicalization and automatisation of L2 elements leading to greater performance control over the L2 system (De Graaff & Housen, 2009; Skehan, 1998; 2003).

In line with the predictions claimed by the Cognition Hypothesis, CAF are adopted to assess the effects of task complexity and task condition on the L2 writing. The literature

suggest that CAF may manifest differently under different conditions and developed differently by different types of learners under different learning conditions. However, there is only a handful of studies that have investigated to what extent the CAF are manifested in L2 production from the effects of task complexity and task conditions.

### 2.5.1 Controversies of CAF in SLA

In the existing studies that have looked into the effects of task features and measured the L2 performance and L2 production with CAF, Housen and Kuiken (2009) identified a few challenges of using CAF as the outcome variables. The challenges found in the previous literature surrounded the definition of CAF as the constructs, the nature of their linguistic correlates and cognitive underpinnings and their connections and interdependency in both L2 performance and L2 development, their empirical operationalization and measurement and the factors that affect the manifestation as well as development of CAF in L2 use and learning. It is believed that the inconsistent findings of those of previous studies were due to the issues as follows.

#### 2.5.1.1 Single Dimensional View on CAF

Previous studies that looked into the CAF research have not explicitly defined the meaning of each CAF component and have somehow adopted a one-dimensional view on each component of CAF (Larsen-Freeman, 2009; Norris & Ortega, 2009; Pallotti, 2009; and Wolfe-Quintero et al., 1998). In addition, the fact that the CAF components are multilayered, multifaceted and multidimensional are not commonly adopted in the empirical CAF literature (Housen et al., 2012).

As noted by Housen et al. (2012), the definition for each component given was either too vague or too general. For example, the component of fluency refers to the ease with which learners produce the L2 or concerning the psychometric instruments and quantitative metrics, the component of complexity refers to the degree, which learners use syntactic embedding and subordinate clauses, in comparison to the total number of clauses produced. This issue might have limited the interpretation and comparability of CAF findings of other studies and thus the inconsistent findings in the CAF literature (Housen et al., 2012; Housen & Kuiken, 2009; Norris & Ortega, 2009; Robinson, Cadierno & Shirai, 2009).

### 2.5.1.2 Vague Demonstration of CAF in Cognitive Processes

In the earlier CAF literature, the constructs of CAF are not clearly demonstrated in light of the cognitive processes when processing linguistic elements with their mental mechanism for L2 performance and L2 development. Housen et al (2012) noted that there is a pitfall in identifying the mental processes of cognitive, linguistic and psycholinguistics in L2 performance, on the basis of synchronic manifestation and in L2 acquisition, on the basis of diachronic development.

As noted earlier, the multidimensional and multicomponential characteristics of each component of CAF are highly unlikely to have only a simple correspondence between each component. As Towell and Hawkins (1994) and Wolfe-Quintero et al. (1998) suggested, complexity of the L2 performance is governed by the state of their declarative linguistic interlanguage knowledge, such as L2 patterns, rules and lexico-formulaic knowledge in which is internalized under the constraint of Universal Grammar. It is also claimed that learners' language is further influenced by the linguistic structures and rules, as acquired as explicit declarative knowledge that have been procedularised and become implicit. As for

accuracy, the component of accuracy is governed by the extent to which the declarative linguistic interlanguage knowledge agrees with native speakers.

Accuracy is also determined by the extent to which the linguistic knowledge is successfully implemented under insufficient proceduralisation. This limitation led learners to process in a less norm-like but more proceduralized interlanguage rules and structures. In this case, complexity and accuracy are considered both primarily connected to a part of the current state of the learners' explicit declarative knowledge and part of the implicit proceduralised interlanguage knowledge. That is to say, complexity and accuracy primarily relate to L2 knowledge representation or relate to the level of analysis of internalized L2 knowledge, at the level of the conceptualizer and the formulator of Levelt's speech production model.

However, fluency refers primarily to the learners' control over their linguistic L2 knowledge system as reflected in the speed and efficiency. L2 learners can access and implement relevant L2 information to communicate meanings in real time, with control improving as they proceduralize their declarative L2 knowledge and automatize the process of gaining access and implementation at the level of Levelt's formulator and articulator (DeKeyser, 2005; Segalowitz, 2010; Towell, Hawkins & Bazergui, 1996; Wolfe-Quintero et al., 1998).

A recent SLA task-based research on the relation between cognitive mechanisms and CAF surrounds Robinson's (2001b) Cognition Hypothesis and Skehan's (1998) the Limited Attentional Capacity Model. Both frameworks focus on the role of attention, working memory, automatisation, reasoning and other cognitive processing mechanisms in the complexity, accuracy and fluency of L2 production during task performance. Robinson's (2001b, 2005) Cognition Hypothesis asserts that when human beings possess multiple

attentional resources and this phenomenon enables learners to draw on multiple pools of attentional mechanism at the same time.

Consequently, when learners attempt task that is cognitively more complex, learners retrieve two performance areas of their attentional mechanisms and are able to express more complex ideas in a more accurate manner. A competing view of Skehan's framework states that human beings have a limited information processing capacity. L2 learners usually prioritize their attention on one dimension of language during task performance. Thus, the attention put more onto one dimension of language production will cause the expense of other two dimensions of the language production.

As Housen et al. (2012) pointed out, due to the scarcity of conceptualization and the clarity of operationalization of the dependent variables, CAF, the empirical evidence available does not really support either model (Robinson, 2011; Robinson &Gilabert, 2007; Skehan 2009).

### 2.5.1.3 Interdependence of CAF

The third issue concerns how CAF components are interdependent other than each component is independent from each other. Larsen-Freeman (2009) asserted that examining the CAF components one by one might cause the overlook of their interaction. As mentioned by Housen et al. (2012), the distinct status of complexity, accuracy and fluency of L2 performance might be interrelated and interacted in the processes of L2 production and L2 development. Larsen-Freeman (2006) and Spoelman and Verspoor (2010) indicate that CAF do not develop collinearly in SLA, but they interact in a supportive and sometimes competitive manner. That is to say, the development of CAF is non-linear and complicated.

As noted by Housen et al. (2012), Ellis (1994) assets that being more fluent occurs at the expense of development of accuracy and complexity due to the different development of knowledge analysis and knowledge automatisation in L2 acquisition and the ways different forms of implicit and explicit knowledge influence L2 development. As mentioned earlier, the LAC model claims that human attentional and processing capacity are limited, thus, when fluency competes for attentional resources with accuracy, accuracy will in turn compete with complexity. Thus, this leads to trade-off effects. However, Robinson's model asserts that learners can simultaneously access to multiple attentional pools without competition due to the availability of the multiple pools of attentional resources.

As predicted by Housen et al. (2012), the developmental sequence of CAF might interconnect in the process of L2 development might occur in a cyclical overall development sequence: complexity, accuracy and followed by fluency. That is to say, the new and more complex L2 structures are internalized and leads to more complex interlanguage systems, that is greater complexity. Then, the modification of the internalised structures leads to greater accuracy.

Finally, the performance is developed in a more controlled manner and that leads to consolidation of the interlanguage systems in which it contributes to more fluent L2 performance. However, as noted by Spoelman and Verspoor (2010), many aspects of language development are non-linear and CAF components are "multivariate and dynamic (p.547). Larsen-Freeman (2006) and Norris & Ortega (2009) also noted that the sub-components of each CAF dimension might interact with other sub-components and has its own developmental dynamics. Larsen-Freeman (2009) also called for more longitudinal CAF research.

### 2.5.1.4 Inconsistent Operationalisation of CAF

The inconsistency of the operationalisation and measures of CAF have been the fourth issue in empirical studies. The operationalisation and measures, such as frequencies ratios and indices for each component of CAF assessed in empirical studies have been the preferred method. One major issue has been whether general or more specific measures of CAF are appropriate for operationalization and measures (Norris & Ortega, 2009; Robinson, 2005; Skehan, 2003). The ways CAF are operationalized and measured have been changing over the years.

As cited in Housen et al. (2012), earlier years, the L2 research used specific measures (Crookes, 1989; Stauble, 1978); later more general measures were adopted to provide a macro picture of performance of CAF. However, in recent years, a finer analyses of CAF has been called for to target more specific sub-domains of language and more distinct linguistic features for each CAF component (Norris & Ortega, 2009; Ellis & Robinson, 2008). The issue found in the recent CAF metrics relates to their comparability, reliability and validity, both as measures of L2 performance, proficiency and indexes of L2 development.

### 2.5.1.5 Synchronic Manifestation and Diachronic Development of CAF

The fifth issue surrounds the variables that affect CAF, in terms of the variable effects on the synchronic manifestation and diachronic development of CAF in L2 performance and L2 learning (Housen et al, 2012). In task-based L2 research, depending on the task variable and the theory underpinnings, their effects on CAF are diverse in nature. The synchronic manifestation of the linguistic features such as the patterns or constructions enhances the understanding of the nature of CAF and the empirical operationalization and measurement of CAF in L2 production.

To mitigate the issues of inconsistency of findings, the operationalization and measure of CAF component is explained and defined further in the following sections.

### 2.5.2 Complexity

As noted by Housen et al. (2012), two distinguished complexities have been used interchangeably in the L2 literature but each should be conceptualized differently, in terms of constructs. Cognitive complexity is a subjective notion, which refers to difficulty encountered by L2 learners when processing language elements. The extent to which the L2 learners encounter the difficulty of processing linguistic elements is partly related to their individual backgrounds, such as their aptitude, motivation, L1 background and L2 development. Linguistic complexity is an objective notion and independent from the learner. It refers to the intrinsic semantic-functional properties of L2 elements, such as forms, meanings as well as the sub-properties of the L2 linguistic elements.

*Complexity* is commonly recognized as the ability to use an extensive variety of sophisticated structures and vocabulary in the L2 (Ellis & Barkhuizen, 2005; Housen, Kuiken, & Vedder, 2012). Foster and Skehan (1996) equated complexity with the number of clauses the learner connects or includes within a sentence. This construct in L2 production shows the development of the restructuring process within the L2 learners' interlanguage systems (Skehan, 1996). Complexity is further analyzed from the lexical and syntactic aspects.

To give more detail, lexical complexity considers language learners' use of vocabulary together with syntactic complexity (see Skehan, 2009). Therefore, a mean segmental type-token ratio (MSTTR) was calculated. While assessing the MSTTR-50, each

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text was divided into segments of 50 words; then the mean type token ratio for all the segments was calculated (see Ellis & Barkhuizen, 2005). As for syntactic complexity, the clauses and T-units were identified in the L2 production.

Following this, three different measures of syntactic complexity were calculated, namely, number of words per clause, number of words per T-unit, and number of clauses per T-unit. Norris and Ortega (2009) support the combined use of these three different measures because these measures gauge three different sub-constructs, namely, sub-clausal complexity, overall complexity, and complexity via subordination.

### 2.5.3 Accuracy

Accuracy has been defined as the degree in which the L2 learner's performance is close to native speakers' (Hammerly, 1991; Pallotti, 2009; Wolfe-Quintero et al., 1998). Any deviations from the norm are considered as errors. In the L2 context, Ellis (2008), Pallotti (2009) and Polio (1997) argued that accuracy should be catered to non-native usages but fully acceptable in certain social contexts or some communities. Following Housen et al. (2012), accuracy is defined as its correctness in terms of the non-deviation from the native norm, but also defined as appropriateness and acceptability.

*Accuracy* is commonly refers to the ability to produce native-like and error-free language. (Ellis, 2003b). Therefore, accuracy refers to the learner's ability to exercise the maximum level of control to prevent errors during a language performance. As for the Accuracy, three measures of accuracy were adopted based on the previous collaborative L2 writing research (e.g., Storch, 2005; Wigglesworth & Storch, 2009).

### 2.5.4 Fluency

As for fluency, it has been generally used to refer to a learner's global language proficiency of spoken or written form. The fluency is determined from the aspects of the ease, eloquence and native-likeness when producing L2 speech or L2 writing. Fluency has widely been used to assess the spoken form in a multidimensional manner (Lennon, 2000). Skehan (2003, 2009) and Tavakoli and Skehan (2005) also claimed that at least three sub-dimensions of fluency can be assessed: speed fluency, breakdown fluency and repair fluency.

These multidimensional components of fluency are generally adopted and mainly for a phonological phenomenon such as to measure the proficiency of L2 spoken speech. Although the fluency component is multidimensional in the L2 speech form, there is a scarcity of definition of fluency for the context of L2 writing. *Fluency* is commonly perceived as the ability to produce the L2 with native-like rapidity as far as the pausing, hesitation, or reformulation are concerned (Lennon, 1990; Housen et al., 2012). Though fluency has mainly been used as the construct for oral L2 production, in the L2 writing field Larsen-Freeman (2006) referred to fluency as the learner's ability to use the language with a high number of words.

As for the measure of fluency, a number of empirical studies found that fluency as included in CAF measures represents a distinct area of L2 writing quality (Housen et al., 2012; Norris & Ortega, 2009; Pallotti, 2009; Skehan & Foster, 1997; Skehan & Foster, 2001). Therefore, all three linguistic measures must be considered if any remarks about language learners' performance and proficiency level are to be made. The current study adopted Larsen-Freeman (2006) approach to measure fluency which considers the number of words in the language production, that is, the total length of the text and the total number of words per T-units (W/T).

## 2.6 Task Complexity and Second Language Writing

Writing in L2 serves as a critical act for interlanguage development (Weissberg, 2000) as it requires an L2 learner's conscious mental state and productive skills to produce another language other than the first language. Writing is a two-way interaction between social-cognition and text development (Bereiter & Scardamalia, 2013; Scardamalia, Bereiter, & Steinbach, 1984). Learners' attentional mechanism and memory resources are expected to expand through a broad basis of prerequisite literacy and critical thinking skills gained from social contexts during solving the problems related to contents, concepts and linguistics. In order for L2 writing to take place, learners are required to apply their prior knowledge gained from the social contexts to a discourse community (Bruffee, 1986).

In the past four decades, L2 writing has been considered as an individual act (Wigglesworth & Storch, 2009). It is only recently that the role of grammar instruction in L2 learning has been neutralized by integrating the communicative language teaching approach in the L2 classroom (Nassaji & Fotos, 2004). However, in many ESL & EFL contexts, it seems that the focus is still placed on traditional teaching with explicit emphasis of overt linguistic features and grammatical rules before communicative activities (Hall, 2016). In this case, learners' linguistic and cognitive growth (attentional and memory resources) might have been restricted and compromised over repeated drillings, memorization as well as typical present, practice, produce (PPP) teaching approach in the language classes.

Task-based language teaching is not an alternative to more traditional, form-focused approaches, but to be used alongside them (Ellis, 2009). To find the equilibrium between conventional teaching and contemporary TBLT, writing should take in culturally and socially situated processes which will sharpen the receptive and cognitive skills. Since Swain and Lapkin (1998) assert that "the co-construction of linguistic knowledge in dialogue is

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language learning in progress" (p.321), transferring the spoken interacted knowledge into written form should be strengthening language learning in progress as it requires cognitive attention for a second thought.

Even though L2 writing has been discussed as advancing learners' cognitive domains and contributing to L2 acquisition (internalization and automaticization), it seems that only a few empirical studies examined the impacts of task complexity on L2 written production, measured by global linguistics measures, Complexity, Accuracy and Fluency (CAF) (Kuiken & Vedder, 2007). In this respect, the effects of task complexity on L2 written production can scarcely reach a solid conclusion due to the very limited literature.

Complexity can be measured by two means, syntactically and lexically (Housen & Kuiken, 2009). Syntactic complexity is measured by i) the number of clauses per T-unit, ii) the number of dependent clauses per T-unit and iii) the number of dependent clauses per total number of clauses (Wolfe-Quintero, Inagaki, & Kim, 1998). T-unit refers to an independent clause and its dependent clauses. Lexical complexity is measured by type-token ratios, which are the number of word types divided by the square root of two times the total number of words (Carroll, 1967). Accuracy is measured by the number of error-free T-units, error-free T-units per T-unit and the number of errors per T-unit. Fluency can be measured by both the number of words per T-unit and the number of words per sentence. These two measures are widely used fluency ratio measures for L2 written performance (Wolfe-Quintero et al., 1998).

In light of task-based language learning and teaching, a number of studies investigated the effects of task complexity on L2 writing over the past decades. The more recent study, Ishikawa (2007) investigated the effect of task complexity *here-and-now* on L2 narrative writings. 54 Japanese high school students participated in the study. The students were arranged into two groups to complete simple and complex tasks. A group (*n*=27) performed

a simple narrative writing task, i.e, *here-and-now* with a cartoon strip as a reference while the other group (*n=27*) performed a complex version of the task with *there-and then* without a cartoon strip.

In other words, the simple task required the L2 learners to narrate their stories in the present tense using the vignette as a prompt whereas the complex task required the students to write in the past tense with no vignette provided. The findings showed that tasks that are cognitively more complex (*There/Then*) yielded a higher complexity, accuracy and fluency in the L2 narrative writings. These results seems to lend support to the Cognition Hypothesis although the findings of the study could be due to the effects of the resource-dispersing variable, which was the 5-minute pre-task planning time, that might have reduced the complexity level of the resource-directing variable (*here/now*) task. This possible effect has also been pointed out by Skehan (2009) and Rahimi (2018).

Kuiken and Vedder (2007) investigated the effects of task complexity on the L2 language performance by using general versus specific measures of writing proficiency. The task complexity was operationalised with ± *number of elements* and ± *number of reasoning demands*. 84 Dutch learners of Italian and 75 Dutch learners of French participated in the study. The general measure of writing proficiency was analysed with the global linguistics measures of CAF. Accuracy was examined in greater detail based on the type of errors committed in the L2 written texts, whereas the lexical complexity was examined further by differentiating frequent words from infrequent ones. The findings revealed that a complex task led to a significant decrease of errors. From those findings in the complex task, the researchers also discovered a trend for a lexically more varied text. This indicated that the effect of task complexity on accuracy could mainly be attributed to lower ratios of lexical errors in the more complex task.

Cho (2015) investigated the effects of task complexity on argumentative writing measured by CAF. The task complexity was operationalized with ± *reasoning demands* and ± *few elements* in the tasks about dormitory life like choosing the best roommates in which was about the learners' common interests. The simple task required learners to provide four aspects whereas the complex task required learners to state six aspects to consider when choosing the best roommate. In total, 110 Korean high school learners of English participated in the study in which a group (n=55) performed in a simple task whereas the other group (n=55) performed in a complex task. The findings revealed that the complex task led learners to produce more fluent writings as compared to the simple task group. As for accuracy and complexity, the findings showed that task complexity did not have any statistically significant effect on accuracy or syntactic complexity of the argumentative writings. The findings of the specific measures also revealed that there was no any effect on the frequency or the use of conjunctions. The results seem to not lend any support to the Cognition Hypothesis.

Kuiken and Vedder (2008) examined the degree to which task complexity affected the L2 proficiency levels of the language learners. They recruited 91 Dutch learners of Italian as L2 and 76 Dutch learners of French as L2. The participants were divided into low and high proficiency groups. The researchers used two versions of written advice tasks, i.e. simple and complex in which the task complexity of each task was operationalized with Robinson's resource-directing elements, ±*number of elements* and ±*reasoning demands*.

The simple task required participants to provide 3 elements while the complex task required 6 elements to produce a written advice to a friend concerning the choice of a holiday destination. Remarkably, in contrast to the findings reported by Ruiz-Funes (2015) and Norris and Ortega (2009), Kuiken and Vedder (2008) ascertained that there was no interaction between the type of task and the proficiency level of the language learners.

However, task with cognitively more complex yielded a greater accuracy and a higher lexical complexity, but there was no significant effect on the syntactic complexity. These results seem to only partially support the Cognition Hypothesis.

In another study, Kuiken and Vedder (2008) further analysed the results obtained from their earlier investigation (Kuiken and Vedder, 2007). The analysis concerned Grammar, Lexicon, Spelling, Appropriateness and Other errors as well as the assessment of lexical complexity by making a distinction between frequent and infrequent words. The data were collected from 84 Dutch learners of Italian as L2 and 75 Dutch learners of French as L2. The researchers examined to what extent task complexity had an effect on the students' L2 writing. They investigated if there was an interaction between the within-subjects variables, task complexity and the between-subjects variables, proficiency levels (high vs low) in the analysis of accuracy. The findings revealed that for the learners of Italian there was a statistically significant effect of learners' language proficiency level on the Grammar, Spelling and Other errors.

The high proficiency learners outperformed the low proficiency leaners in all five categories. Regarding the task complexity, the students performed significantly better in terms of Lexical errors in the complex tasks than in simple tasks. As for lexical complexity, the participants produced more frequent words in the complex tasks than in the simple tasks. The results indicated that there was no statistically significant interaction between task complexity and proficiency levels of the L2 learners.

In the series of studies by Kuiken and Vedder (2009, 2011, 2012), the data from their studies were compared to examine the influence of the oral and written modes as far as task complexity was concerned. The two writing tasks employed in the first study (Kuiken and Vedder, 2008) were given as speaking tasks to another group of 44 Dutch learners of Italian

to investigate the syntactic complexity, lexical variation and accuracy in the oral L2 production mode. In the written mode, the participants produced a written letter whereas in the oral mode, the participants were required to produce a phone message.

The findings revealed that their L2 production of accuracy as well as lexical and syntactic complexities were significantly influenced by the students' proficiency level. In the written mode, the effect of task complexity had a significant impact on the accuracy, but no interaction between proficiency level and task type on any measures.

Frear and Bitchener (2015) partially replicated Kuiken and Vedder's (2012) research to investigate the effect of task complexity on lexical and syntactic complexities in the L2 written production. The researchers recruited 34 non-native speakers of English studying at language schools in New Zealand. The task complexity variable was operationalized as *reasoning demands*. The participants were given three letter-writing tasks, Task 1 (low complexity), Task 2 (medium complexity) and Task 3 (high complexity). The findings revealed that Task 1 (low complexity) and Task 3 (high complexity) resulted in a higher lexical complexity. Contrarily, for the syntactic complexity, Task 1 (low complexity) produced a higher number of adverbial clauses compared to Task 2 (medium complexity) and Task 3 (high complexity).

The overall results of Frear and Bitchener (2015) indicated that the increase in lexical complexity did not lead to an increase in syntactic complexity. The results also indicated that there was no statistically significant affect in the ratio of dependent clauses to t-units across all types of dependent clauses. Following this, the researcher proceeded to analyze the ratio of dependent clauses to T-units for each type of dependent clause separately and discovered that with increasing task complexity, there was statistically significant decreases occurred in the production of adverbial dependent clauses. The authors concluded that their findings did

not lend support to the Cognition Hypothesis, which might be due to the misalignment of task complexity with participants' ability to use automated subordination.

Rahimi (2018) investigated the effects of increasing the reasoning demands and number of elements on the CAF indices. In his study, two argumentative tasks were adapted from Révész (2011) and the participants were 60 upper-intermediate FL learners of English in Iran. The findings revealed that increasing task complexity produced a higher number of subordinate clauses with a greater lexical and syntactic complexity but also with a reduced writing accuracy. These findings lent support to the Trade-off Hypothesis (Skehan, 1998) and the Cognition Hypothesis (Robinson, 2001, 2003).

Ruiz-Funes (2015) investigated the effects of task complexity in essay writing, in terms of the measures of syntactic complexity, linguistic accuracy and fluency. The researcher recruited undergraduate foreign language (FL) learners of Spanish in an American university. Those participants were divided into two levels of language proficiency: advanced and intermediate. The researcher discovered that the complex tasks yielded higher syntactic complexity but lower accuracy and fluency regardless of their language proficiency levels.

The results also revealed that when learners were allocated into high performance and low performance groups, complex task performance had positive changes in syntactic complexity, accuracy and fluency simultaneously produced by high performance advanced level learners. As noted by the researcher and Norris and Ortega (2009), these results suggested that the relationship between the effects of task complexity in L2/ FL writing as well as their attentional resources and CAF could be associated with language proficiency level along with the learners' expertise in writing. This finding pointed to the existence of the trade-off effects among the linguistics measures.

Thus far, it appears that a majority of studies adopting the Cognition Hypothesis have tended to focus on the monologic oral production whereas only a small number of studies looked at the effects of task complexity on dialogic interaction. Even fewer studies examined the effects of task complexity on L2 written production while only a limited number of empirical studies investigated the combined effects of task features from cognitive-interaction perspectives. It also seems that there is a lack of close examination on the effects of interactional episodes on the uptake of linguistic input in the modality of L2 writing.

## 2.7 Peer Interaction

Interaction in the context of task-based L2 learning and teaching refers to any conversations created and participated by learners when attempting pedagogical tasks. Producing interaction when performing class tasks is deemed crucial for language learning opportunities as it provides a platform for learners to notice, seek assistance and receive information about the correctness and incorrectness of their utterances when expressing their ideas (Gass and Mackey, 2007; Robinson, 2003).

For the problematic utterances, the opportunities of noticing occurs when learners receive negative evidence through the interactional feedback from their peers. Through interaction, it provides learners with verbal assistance regarding linguistic or content information. Gass (1997) asserts that negative evidence plays a crucial role in the interaction-learning process because the overt correction or negotiation alerts a learner the possibility of an error in his or her speech. The speaker or the peers could notice the difficulty in expressing ideas.

When an error is noticed, the speaker will figure what the problem is, he or she might produce some hypotheses about how or what the correct form should be, and then he or she will look for ways to modify the problems. This phenomenon also provides opportunities to the peers to assist by providing immediate input to the speaker to confirm, disprove or receive immediate correct form of linguistic features. After receiving the immediate input from the peers, the speaker might take up the recast and use it in his or her speech.

### 2.7.1 Negotiation of Meaning (NoM) in SLA

Negotiation of meaning is a process that interlocutors experience to attain comprehensible input, with some commonly found strategies, such as confirmation checks, clarification requests and comprehension checks. According to Long's (1985, 1996) Interaction Hypothesis, the phenomenon of negotiation for meaning is bound to occur in interaction. The common speech acts found in negotiation for meaning are confirmation checks, clarification requests and comprehension checks. Long (1996) proposes that environmental contributions to acquisition are mediated by selective attention and learners' developing L2 processing capacity. These attentional resources are brought together during negotiation for meaning.

NoM is well explained by Long (1996) that "negotiation for meaning, and especially negotiation work that triggers interactional adjustments by the NS or more competent interlocutor, facilitates acquisition because it connects input, internal learner capacities, particularly selective attention and output in productive ways" (pp. 451- 452). He also further asserts that during negotiation for meaning, negative feedback may be facilitative of L2 development, at least for vocabulary, morphology and language-specific syntax" (p. 414).

It is believed that through interaction, learners' attentional resources, their selective attention are driven to the problematic aspects of knowledge or production. Learners may notice the difference of their interlanguage system and the native language system. Schmidt and Frota (1986) labelled this stage as noticing the gap. The noticing the gap stage will drive learners' attention to seek assistance from others, such as new vocabulary or grammatical sentence structures. If there is immediate input or feedback provided by peers, learners will take up the new knowledge and thus promote the L2 development.

Some implicit feedback provided by peers includes confirmation checks that are uttered to elicit confirmation that an utterance has been correctly heard or understood. Interlocutors normally use confirmation checks to ensure accurate comprehension is obtained. For example, an interlocutor may ask the speaker "Do you mean that…" to confirm of his or her understandings.

Another negotiation strategy, which is clarification request is an expression created by interlocutors to elicit clarification of another interlocutor's preceding utterances. For instance, "What did you say?" is one of the commonly used question phrase to request for clarification of the preceding utterances.

The third negotiation strategy is comprehension check whereby it is an expression created by interlocutors to verify that the utterance made has been understood by others. For example, "Did you understand?" is commonly used phrase to check others' understanding of the utterance made.

Recasts have recently been noticed during the use of NoM strategies. In a book edited by VanPatten and Williams (2007), recasts is a rephrasing of an incorrect utterance with the use of a correct form while having the original meaning intact.

### 2.7.2 Language-Related Episodes (LREs) in SLA

Languaging was put forward by Swain (1985, 1995, 2005) for the Output Hypothesis based on her research works. She found out that students who were exposed to L2 input with only receptive skills such as reading and listening had their productive ability delayed. She argues that their delayed productive ability was due to the lack of active productive skills, such as speaking and writing. Thus, learners could only partly process the semantic processing, which was the comprehension of the L2 texts, but not the linguistic processing. She opines that only production will force L2 learners to take on thorough grammatical processing, in which it helps learners to develop their L2 morphology and syntax.

Swain asserts a few claims about the functions of learners' output in the L2 learning. Through class tasks that prompt learners to perform with the target language, it provides a platform for learners to express their ideas and learners will be aware of the problems in their current L2 system when they encounter difficulty to express their ideas further. This phenomenon serves as a "noticing or triggering" function which raises consciousness of learners to realize the gaps in them, and lead them to reflect on, discuss and analyse the problems explicitly which serves as reflective role. The production stage of learners also enable them to experiment with new sentence structure of vocabulary in which it serves as hypothesis-testing role (Swain, 1995; Mitchell, Myles & Marsden, 2013).

Among the three claims made by Swain, she focuses more on the reflective role, which is on the learning opportunities of metalinguistic talk between peer interaction and L2 development (Swain and Lapkin, 1995; 1998). In her later work, she adopted a neo-Vygotskian, collaborative notion of L2 learning or is better known as languaging, which means collaborative metalinguistic talk. Swain (2009) also claimed the phenomenon of her study in which learners used L2 medium as their private speech as languaging. From

cognitive interactionist perspectives, languaging refers to the cognitive process of negotiating and producing meaningful, comprehensible output as part of language learning (Swain 1985, 2009).

Swain and Lapkin (1998) who focuses on the metalinguistic function of reflective role later calls it as Language-related Episodes (LREs). LREs refer to the conversational turns discussing morphosyntactic linguistic forms, such as vocabularies or sentence structure. In other words, LREs refer to the discussion regarding the language they are producing, question their language use or correct themselves or others. The sub-categories of LREs are lexis-based, form-based, self-repairs and other-repairs. The self-repairs might occur during the hypothesis-testing stage or after the metalinguistic stage. The interactional feature like other-repairs occurs as part of the recast whereas self-repairs that occur after the metalinguistic stage is viewed as uptake of recast.

In the peer interaction, LREs are analyzed in terms of their nature, form-based or lexical-based) as well as their outcome with the interactional features, such as correctly resolved, incorrectly resolved or unresolved. In form-based LREs attention is focused on issues such as phonology and morphosyntax, while in lexical-based LREs attention is focused on word-related discussion. Some prior research investigated the effect of task modality on the nature of LRE (Adams & Ross-Feldman, 2008; García Mayo & Azkarai, 2016) indicated that speaking tasks lead to more meaning-focused LREs, whereas those that also include a writing component trigger more form-focused LREs.

**2.7.3 Uptakes of Recast in SLA**

Uptake is explained in the context whereby learners are presented with corrective feedback, they have different responses at their disposal. Uptake has been extensively used in SLA field. Allwright (1984) defines uptake as what learners are able to report during or at the end of the lesson. Another definition of uptake was offered by Lyster (1998b) that learners' response to the feedback they receive from the teachers. Lyster and Ranta (1997, p. 49) explains that "uptake […] refers to a student's utterance that immediately follows the teacher's feedback and that constitutes a reaction in some way to the teacher's intention to draw attention to some aspect of the student's initial utterance."

Uptake refers to a learner's utterance that immediately follows another peer's feedback and that consists of a response in certain way to the peer's intention to draw attention to some aspect of the learners' initial utterance. Recast, in the context of SLA refers to the phenomenon where the teacher repeats what the learner has produced, with corrective feedback but without any explanation and without obstructing the natural flow of communication (Lyster & Ranta, 1997). In the later peer interaction studies, recasts also refer to any corrective feedback or repairs, usually given by more knowledgeable others. Recasts are the most common interactional features found in a conversation but also considered as the least effective way for noticing because it hardly leads to self-correction by learners.

In Mackey et al. (2000) study, the researchers found that the non-native speakers were not fully aware of feedback provided by the native speakers that contains the correct form of L2 morphosyntactic information. The non-native speakers thought interpreted those feedback as content-based than linguistic-based form. Egi (2007a, b) studies examined the degree to which L2 Japanese adult learners interpret corrective feedback as content and/ or language-

based forms; also found that only around 17 percent of recasts were interpreted as content-based than focus on L2 form.

A recast study conducted in a laboratory setting by Philp (2003) examined learners' noticing of morpho-syntactic recasts with different approaches. It is found that participants could reproduce a high number of recasts they have heard. As for accuracy of the repetitions made by the participants, it depended on their language proficiency levels, the length of the recast as well as the number of corrections contained.

The results suggested that learners had difficulties in repeating the linguistic forms that were not currently part of their interlanguage grammar, unless the length of the corrective feedback was short. It is mentioned that when recasts were made complex with more than one problem was highlighted, learners would have difficulty to respond to the corrective feedback.

Mackey (2006) asserts that noticing serves as a potential mediator to assist learners to learn from the corrective feedback provided by peers. This is probably to raise awareness of learners of their gaps in the conversation, and encourages them to repeat the corrected form and repair the form after the feedback. Pica (1994), Nicholas et al. (2001), Ellis and Sheen (2006) researched the uptakes of L2 and commented on the significance of attention for uptakes of L2.

The scholars also explained the effectiveness of negative feedback and commented its saliency and attention. Mackey (2007b) also commented that interaction research to date made very limited reference to models of attention, awareness and noticing. However, Robinson (2001, 2003, 2005 & 2007) asserts that a more complex task promotes interaction

and heightens the attention of noticing and make the information salient for learners to uptake the recasts.

## 2.8 Task Complexity and Peer Interaction

In the event of interaction, learners tend to use varied interactional moves to amend the conversational gaps especially during communication breakdown, for instance, Negotiation of Meaning (NoM) and its interactional episodes: *comprehension checks, clarification requests*, and *confirmation checks* (Long, 1981). Next, meta-talk which consists of Language Related Episodes (LREs) takes place when learners discuss or question the rules or forms of the language they are producing (Swain & Lapkin, 1998). In LREs, learners might use (*self-/other-) repairs* to correct themselves or others. If the immediate feedback is provided, *recast* might occur when the ill-formed utterance is reformulated. Recasts are effective in showing learners how their current interlanguage differs from the target language (Long & Robinson, 1998).

Such types of interactional feedback are likely to stimulate learners to switch their attention from meaning to form and at the same time help learners to notice gaps in their linguistic repertoire, be it internally or externally. If feedback is provided instantly during interactional occurrence such as communication breakdown, learner's attention will be directed to the linguistic features of the input and then the uptake of input takes place. After the incorporation of the available input, the process of internalization begins. Learners might reformulate the sentence structures for L2 production. Gradually, a learner's cognitive processing is likely to be prompted to access the current interlanguage, and this encourages

faster and more automatic access and use for L2 development and acquisition (Robinson, 2005).

There are a number of studies examining the effects of task complexity on interaction, in terms of NoM, LREs and CAF in the light of the Cognition Hypothesis. Studies that have looked into the effects of task complexity on interactional feedback such as NoM are Peter Robinson (2001b), Nuevo (2006), Robinson (2007a) and Gilabert et al. (2009), LREs are Nuevo (2006), Révész (2007) and Kim (2009) as well as CAF are Michel, Kuiken, and Vedder (2007) and Michel, Kuiken, and Vedder (2012). Majority of these studies looked at the influence of task complexity on the interaction measured by *NoM* and *LREs*, however there were only a handful of studies, which looked into the effects of task complexity on interaction measured by the global linguistics measures, CAF.

Specifically, from the aspect of NoM, Robinson (2001b) manipulated two variables: task complexity and task condition, in terms of the number of elements and familiarity simultaneously. The simpler task consisted of a few elements and references of a small area that was known to the learners while the more complex task was with many elements but was unknown to the learners. The findings revealed that the complex task group produced higher number of NoM such as comprehension checks and clarification requests in which the results were supporting the Cognition Hypothesis and also consistent with part of the findings of Nuevo (2006), Robinson (2007a) and Gilabert et al. (2009).

By the same token, Nuevo (2006) looked into the impacts on NoM and an addition of LREs by manipulating task complexity with the order of the structure on a narrative task. The simpler task was provided with ordered vignettes while the complex task was with unordered vignettes in which the learners needed to reorganize the plot during the story narration. The results indicated that task complexity induces more NoM such as confirmation

checks, comprehension checks as well as LREs such as self-repairs and hypothesis testing in which learners initiated repair of their own speech in the interaction. Likewise, Peter Robinson (2007a) focused on the impact on NoM only with single variable manipulation for task complexity. In his study, task complexity was manipulated by inducing reasoning demands of a picture description task with three complexity levels, from low to high intentional reasoning demands. Like other studies, the results showed that increasing task complexity progressively elicited higher number of clarification requests and confirmation checks.

In Gilabert et al. (2009) study, the researchers investigated the impacts of task complexity on NoM and LREs. The task complexity was manipulated with the number of elements and reasoning demands, the degree of displaced and past time reference across three different task types: a narrative reconstruction task, an instruction-giving map task and a decision-making task. Overall, the results revealed that task complexity demonstrated a strong influence on most measures of interaction for NoM and LREs, especially clarification requests and comprehension checks as well as repairs; however, not for recasts. Nonetheless, this strong impact occurred in the task types of the narrative reconstruction task and the instruction-giving task, but not in the case of the decision-making task.

This might be due to a higher level of cognitive complexity involved as reconstruction needs the process of reforming the ideas whereas the instruction-giving task requires the demands of clear understanding of the instruction from the listeners and precise specification from the speakers. The number of repairs was always significantly higher when the three task types were performed under complex conditions. However, these findings are contradictory to  the additional findings of Michel et al. (2007); but, are aligned with the Cognition Hypothesis and also compatible with Nuevo's (2006) findings.

As for the effects of task complexity on LREs, Révész (2007) used a photo description task to look into the impact of recast. Task complexity was manipulated by having or not having visual support. In the simpler task, learners could refer to pictures when performing the task whereas in the complex task, learners performed the task without the pictures. The results showed that recast was more effective for learning when produced in complex tasks. These findings lent support to the Cognition Hypothesis. Conversely, Kim (2009) who looked into the impacts on LREs with the manipulation of the same variables as Gilabert's et al. (2009) had slightly different findings.

Kim (2009) investigated the impact of task complexity on the occurrence of LREs in two task types: picture narration and picture difference tasks. Task complexity was manipulated with the number of elements and reasoning demands. In her study, ESL students with two different proficiency levels: low and high carried out four tasks which differed in terms of task complexity and task type. The findings indicated that the effects of task complexity on the occurrence of learning opportunities (interaction) differed depending on task types and learner proficiency. Therefore, the results only partially supported the Cognition Hypothesis that significantly more LREs occurred during the complex than the simple version of the task by the high group learners with the picture narration tasks and by the low group learners with the picture difference tasks.

With regard to the impacts of task complexity on interaction, in terms of CAF, Michel et al. (2007) investigated the effects of task complexity with the manipulation of the number of elements on monologic and dialogic product-description tasks. The results revealed that dialogic tasks triggered more accurate and fluent output. However, the interaction of task complexity and task condition showed effects on measures of accuracy only. The complex monologic tasks generated more accuracy whereas complexity was only marginally affected.

Although the study did not specifically measure interactional feedback concerning LREs, the findings suggested that task complexity did not have any impact on self-repair in the dialogic tasks. Thus, the results only partially supported the Cognition Hypothesis and this was in conflict with Gilabert et al. (2009) and Nuevo (2006) findings.

Later, Michel et al. (2012) examined the effects of the same independent variables as in their earlier study (Michel et al., 2007), to be specific, the number of elements as well as monologic and dialogic tasks on L2 oral task performance, CAF. Moreover, the study also evaluated differences between monologic and dialogic tasks, and compared the combined effects of the factors of the number of elements and the task features. The results revealed that there were hardly any effects of the manipulation of task complexity with the number of elements on oral task performance, in terms of CAF. However, dialogic tasks, consistently guided L2 performers to produce greater accuracy, lexical complexity, and fluency. Again, the results partially supported Cognition Hypothesis.

Noteworthy is the fact that whether or not task complexity was investigated within a single continuum (Nuevo, 2006; Revesz, 2007; Robinson 2007b) or crossed continuums within the Triadic Componential Framework (TCF) (Robinson, 2001b and Gilabert et al., 2009; Michel et al., 2007; Kim, 2009 and Michel et al., 2012); most studies up to date still revealed inconsistent findings. The same applied to studies that examined task complexity within the dimension of task complexity (Nuevo, 2006; Revesz, 2007; Robinson 2007b, Kim, 2009; Gilabert 2009) and crossed task dimension of TCF (Robinson, 2001b; Michel et al., 2007, 2012). Majority of the studies showed that increasing task complexity also increased the interactional episodes, in terms of NoM and LREs, except for Kim (2009) and Michel et al. (2007) that only partially supported the Cognition Hypothesis.

Pioneers like Michel et al. (2007), Michel et al. (2012) and Robinson (2001b) have extended the investigation by combining two task dimensions of TCF, namely, task complexity and task condition to examine the interactional feedback. However, to date, no empirical study has been conducted to look at the combined effects of task complexity and task condition (*the number of participants*) on interactional feedback, in terms of NoM and LREs.

The variable of task condition being manipulated in Robinson (2001b) was *familiarity* imposed on the task whereas in Michel et al. (2007, 2012) was *monologic* versus *dialogic* task. Seeing from the perspective of interaction as predicted by the Cognition Hypothesis, although the dialogic task employed in Michel and the researchers' studies involved the conversation with another speaker over the mobile phone, the medium in which the conversation was exchanged seems to be less authentic as compared to face-to-face interaction of a classroom setting.

Nonetheless, the dependent variables in which they focused on were CAF, instead of NoM and LREs which are claimed to be able to create conducive learning opportunity for linguistics enhancement (Kormos, 1999; Long, 1983; Nicholas et al., 2001; Swain & Lapkin, 1998). For that reason, it provides less insight into the impact of task complexity on interactional feedback as in investigating the relationship between task complexity as well as the processing and development of a cognitive linguistic faculty.

## 2.9 Motivation of the Study

Given these premises, it is important for this study to look into the synergistic effects of task complexity and task condition on L2 individual writing and peer interaction. Although it has been argued that tasks for pedagogical purposes should be distinguished from tasks for research purposes, in this study, the researcher has adopted the concept of task as defined by Ellis (2007) and Skehan (1998). That is, apart from using tasks to induce students to learn by interacting using the authentic language as part of the general principles and characteristics of TBLT, the focus is also placed on the natural learning, which is process-oriented rather than product-oriented. Based on the literature review, the tasks designed for the experiment purposes in this study has fulfilled most of the agreeable traits from real-world and pedagogical tasks. The argumentative-based topics set for the writing tasks tend to stimulate learners to perform an in-depth cognitive process and prompt the learners to produce two-way interactive discussion among themselves.

As Ellis (2009) explains that implicit knowledge is available through automatic processing when the language used is unplanned, in this study, the peer interaction prior to the L2 individual writing could be deemed less planned since they discussed the topic spontaneously. With regard to explicit knowledge, it is generally accessible only through controlled processing, with the application of attentional processes. In this case, the construct of the L2 individual writing might manifest the explicit knowledge the L2 learners have demonstrated, since their peer interaction might have laid a platform for them to speed up the execution of the declarative facts, about the grammatical rules when forming their argumentative writing. Drawing on the views made by Ellis (2009) that the L2 performance demonstrates an amalgam of implicit and explicit knowledge of L2 learners, this study views

implicit and explicit learning and knowledge as a continuum and a dynamic interface in which both inter-facilitate each other in the SLA journey.

This study is a cross-sectional study, hence, whether or not the explicit knowledge can be proceduralised and automatised might not be garnered from the findings. In addition, this study would not be able to attest whether or not explicit knowledge can be developed into implicit knowledge as this might not be evident from the L2 individual writings collected immediately after the peer interaction. In other words, instead of explaining how distinct they are, this study looked into how these two somehow distinct but inseparable components work together in directing L2 learners' attention to produce more accurate and complex L2 individual writing and to what extent the two was manifested in the peer interaction.

Due to the rival view from Skehan's (1998) Limited Attentional Capacity model as well as the lack of empirical studies that validate the Cognition Hypothesis and its Triadic Componential Framework, this study investigated the effects of task complexity and task condition on L2 individual writing and peer interaction. The task complexity variable was manipulated based on the natural progression sequence: from simple to complex; in three constant task conditions, individual, dyadic and triadic groupings. Based on the literature reviewed thus far, this study examined the synergistic effects of task design variable, that is *task complexity (i.e. -/+causal reasoning demands)* and implementation variable, that is *task condition (i.e. +/- number of participants)* on L2 individual writing, in terms of CAF and peer interaction, in terms of NoM, LREs and Uptakes of recast. The findings of this study hope to fill the research gap with empirical evidence.

Based on the literature reviewed, this study is interested to examine whether the dependent variables, such as NoM and LREs of the peer interaction would enable the learners to pay greater attention to the linguistic features. At the same time, this study also considered

the extent to which the implicitness or explicitness of the LREs-recast would affect the students' uptake of recast and to what extent it would influence the L2 individual writing.

## 2.10 Summary

This chapter summarises the research studies pertaining to the effects of task complexity on the L2 written production and peer interaction. It also explains the underpinning of the theoretical framework, Cognition Hypothesis, which predicts that task complexity plays a role in enhancing attentional mechanisms and memory resources to process, internalize, automatize and generate L2. Task-based Language Teaching (TBLT) approach provides learning opportunity to learners as it conditions learners to use authentic language to reach functional/ communicative demands in completing the task. According to the Cognition Hypothesis, completing a complex task leads to more accurate and complex linguistic features as compared to attempting a simple task. The more complex task might also elicit more interaction, which will enhance noticing of gaps. It then draw learners' attention to the linguistics features and hence it leads learners to produce greater accuracy and complexity.

The following chapter, Chapter Three on research methodology, provides detailed methodology and explains the research design and methods incorporating qualitative and quantitative data.

# CHAPTER 3: METHODOLOGY

## 3.1 Introduction

The literature on the Cognition Hypothesis portrays task complexity as an important factor in task manipulation for learning opportunities and attention allotment in the cognitive system for L2 production, development and acquisition. Although *causal reasoning demands*, one of the task complexity elements has been delineated as one of the resource-directing factors that promotes interaction (learning opportunities) and heightens the attention allotment in the L2 performance in terms of CAF, the literature shows that it is an under-explored factor, in the task complexity dimension of the Triadic Componential Framework (TCF). Most importantly, there is a need to validate empirically the relationship between task complexity, a cognitive factor, and task condition, as an interactive factor.

Apart from that, the manipulation between *causal reasoning demands* in task complexity and the *number of participants* in task condition dimension is also an empirical concern, be it on the modality of interaction or L2 written production. The current study furthers the investigation by examining the effects of *causal reasoning demands* across different groupings: *individual*, *dyadic* and *triadic*, on two modalities, namely L2 written production and peer interaction. By seeking to validate the Cognition Hypothesis, this study contributes to the theoretical debate between Robinson (2001, 2005) and Skehan and Foster (2001), i.e. whether L2 learners possess multiple pools of attentional resources to attend to complexity and accuracy when attempting tasks with different complexity levels. With this, it provides insights into the body of knowledge about task design and task implementation with communicative language teaching.

A mixed method QUAN→qual strategy was adopted in this repeated-measure experimental design. Thirty-six (N=36) university students were selected to participate in the experiments, based on their particulars filled in the survey form (please refer to Appendix F) that met the basic criteria set in the study. All 36 university students, took part in three task conditions, *individual*, *dyadic* and *triadic*. Firstly, they wrote the simple and complex tasks individually; secondly, they discussed each task in a pair and then wrote the simple and complex tasks individually; and thirdly, they discussed each task in a group of three and then wrote the simple and complex tasks individually.

The following sections explain the methodological approaches used in collecting and analyzing the data in order to address the research questions of this study. The operationalization of the five sets of variables are defined with specific measures. Pilot studies explains how the mechanisms of tasks, i.e. task complexity and task condition were trialed and modified as well as how the criteria of participants were set for purposive sampling prior to the experiment; and then followed by data analysis that explains the statistical and logical techniques used to analyze, illustrate and evaluate the data. The limitations and controls section explains some aspects of the design of methodology that might have influenced the findings and some actions taken in mitigating the limitations.

Data for the L2 individual argumentative writing tasks were analysed and coded with the global linguistic measures, CAF while the peer interactional data collected from the dyadic and triadic groupings were transcribed, analysed, coded and quantified to answer the following research questions:

1. Is there a statistically significant effect of task complexity (simple vs complex task) and task condition (individual vs dyadic vs triadic grouping) on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency* in L2 individual writing?

2.  Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning (NoM), Language-Related Episodes (LREs) and Uptake on two task conditions (dyadic vs triadic grouping)?

**3.2 Research Design**

Methodologically, a mixed method QUAN→qual strategy was adopted in this repeated measures experimental study. The research design of this study (as shown in Figure 3.1) was adapted from the embedded design (Creswell, 2014; Creswell & Clark, 2017). Both qualitative and quantitative data were collected and analysed within a traditional quantitative research design like the previous studies (Caracelli & Greene, 1997; Greene, 2007). The qualitative data were collected and analysed within the predominantly quantitative study, in order to address the primary purpose of the study, that is, the effects of task complexity and task condition on the L2 individual writing and peer interaction.

The qualitative strands, L2 individual writing and peer interaction were embedded within the quantitative experiment. This is to address the primary investigation of this study, that is the effects of task complexity: *+/- causal reasoning demands* and task conditions: *individual, dyad* and *triadic* on the L2 individual written production: lexical and syntactic Complexities, grammatical Accuracy and Fluency (CAF) as well as peer interaction: Negotiation of Meaning (NoM), Language-Related Episodes (LREs) and uptakes of recast.

The collection and analysis of the second data set, quantitative data occurred during and after the implementation of the qualitative data collection and analysis procedures of the experimental study. The qualitative data set served as a supportive and secondary role in this

study. After each L2 written and spoken data was coded and analysed for their respective constructs, each was then quantified into quantitative data for further interpretation.
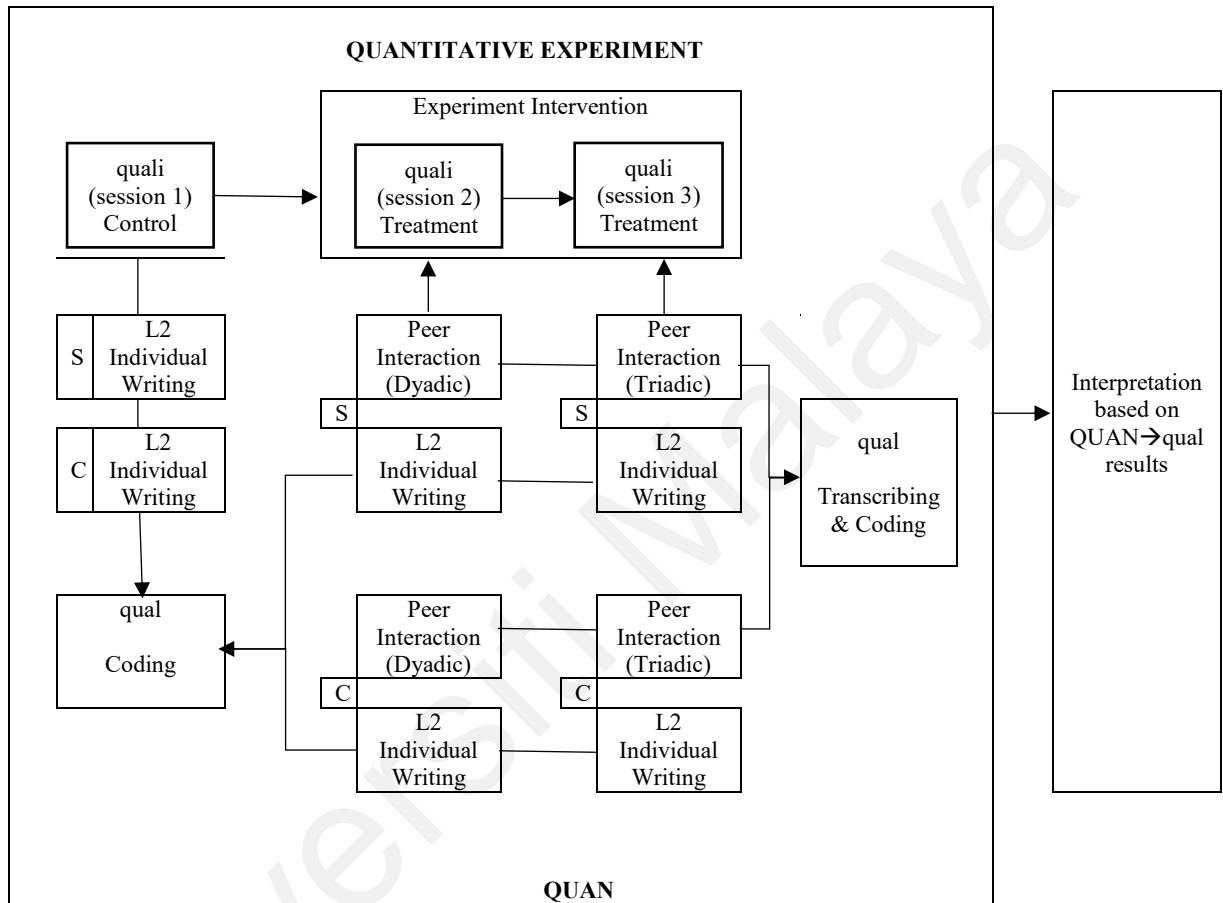


**Figure 3.1: Embedded Design**

*Note:* S represents simple task, C represents complex task, Control represents a condition without peer interaction, Treatment represents a condition with peer interaction.

As shown in Figure 3.2, collecting qualitative and quantitative data was done in three different sessions: invidual, dyadic and triadic. In each session, L2 learners attempted a simple task and followed by a complex task. The individual session was set as a control group as L2 learners performed their individual writing without having any peer interaction prior to their individual writing. In the dyadic and triadic sessions, L2 learners discussed each of

the simple and complex tasks with their peers, in pairs and groups of three followed by an individual writing. The qualitative data for the L2 individual writing and peer interaction were managed and analysed according to the coding system set in this study. Later, the qualitative data were quantified and analysed for further interpretation.
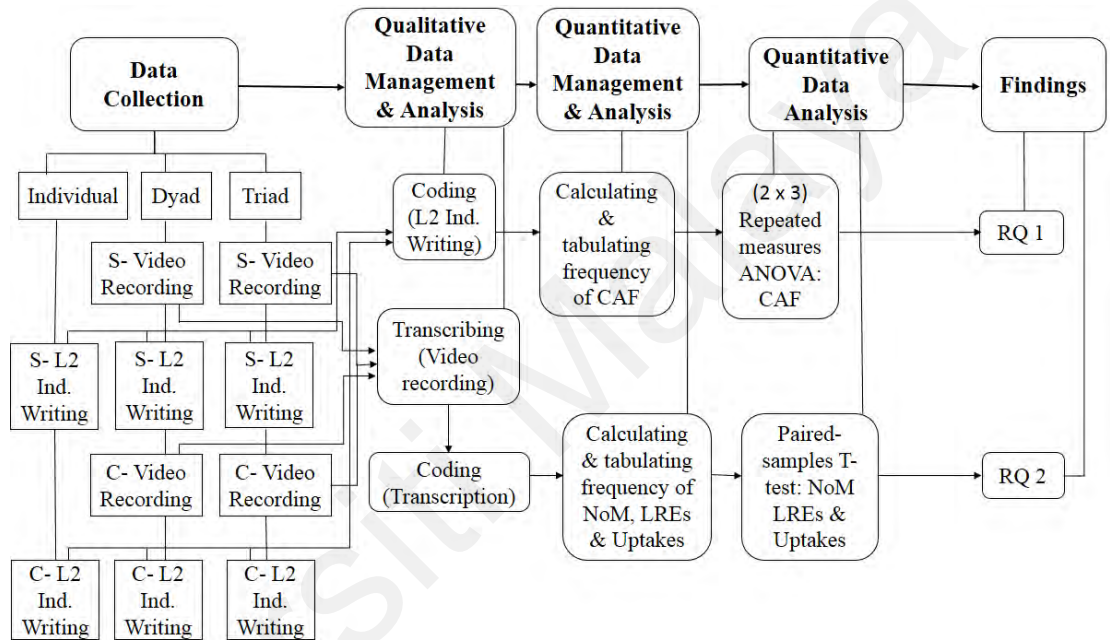


**Figure 3.2: Steps in the data collection, data management and data analysis**

*Note*. S represents simple task, C represents complex task, Ind. represent individual.

## 3.3 Research Questions and Hypotheses

The review of the literature and articulation of the central problem leads to the following three research questions:

1. Is there a statistically significant effect of task complexity (simple vs complex task) and task condition (individual vs dyadic vs triadic grouping) on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency* in L2 individual writing?

This research question investigated the effects of task complexity and task condition (operationalized through -/+ *causal reasoning demands* and +/- *number of participants*) on L2 written production (as measured by lexical and syntactic Complexity, grammatical Accuracy and Fluency). This is to determine under which particular combined mechanisms of task (-/+ task complexity and +/- task condition) that it would facilitate L2 written performance for L2 production, development and acquisition.

$H_0$: The effects of task complexity and task condition (number of participants in interactional groupings) show no significant difference on L2 individual written production (CAF).

$H_a1$: The effects of task complexity and task condition show higher statistically significant difference on L2 individual written production (CAF).

$H_a2$: The effects of task complexity and task condition show lower statistically significant difference on L2 individual written production (CAF).

2. Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning (NoM), Language-Related Episodes (LREs) and Uptake on two task conditions (dyadic vs triadic grouping)?

This research question investigated the effects of task complexity and task condition (operationalized through -/+*causal reasoning demands* and +/- *number of participants*) on peer interaction (operationalized through interactional features such as Negotiation of Meaning and its associated features comprehension checks, confirmation checks and clarification requests, Language-Related Episodes and its related features like recast and repairs, as well as uptakes of recast. This is to determine under which particular combined mechanisms of tasks (+/- task complexity and +/- task condition) that it would facilitate learning opportunities through peer interaction.

*H₀*: The effects of task complexity and task condition condition (number of participants in interactional groupings) show no statistically significant difference on interactional features.

*Hₐ1:* The effects of task complexity and task condition show higher statistically significant difference on interactional features.

*Hₐ2:* The effects of task complexity and task condition show lower statistically significant difference on interactional features.

## 3.4 Variables

There are five sets of variables involved in the study (as shown in Figure 3.3), independent variable, moderator variable, dependent variables, mediating variable and control variable.

| **Independent Variable**<br><br>2 (Task Complexity)<br><br>a) Simple<br>b) Complex | **Moderator Variable**<br>3 (Task Condition)<br><br>a) Individual<br>b) Dyadic<br>c) Triadic<br><br>**Intervening/Mediating Variables**<br><br>* i.e. attention/ memory/ / cognitive process (language learning processes) | **Dependent Variables**<br><br>L2 Individual Written Production<br><br>a) Complexity<br>b) Accuracy<br>c) Fluency | Peer Interaction<br><br>a) Negotiation of Meaning (NoM)<br>b) Language-Related Episodes (LREs)<br>c) Uptake of recast |
| **Control Variables**<br><br>Grouping format, i.e. dyadic and triadic<br>Participant grouping, i.e. homogeneous & heterogeneous<br>Sequence of task complexity levels, i.e. simple to complex<br>Topics for Writing Tasks (Argumentative-based topics)<br>Task Type, i.e. Argumentative Tasks<br>Pre-task preparation Time, i.e. 10 minutes<br>Interacting Time, i.e. 15 minutes (for dyads & triads)<br>Writing Time, i.e. 40 minutes<br>Sequence of grouping format, i.e. individual to dyadic;<br>                       dyadic to triadic<br>Proficiency levels, minimal entry requirement i.e. MUET Bands 3 | | | |

**Figure 3.3: Types of Variables in the Study**

The only independent variable, task complexity is a categorical variable, which takes on a value of dichotomous complexity levels: simple and complex tasks. The moderator variable, task condition was arranged in three different participant-grouping formats: individual, dyadic and triadic to investigate to what extent the different participant-grouping formats affect the strength of the relationship between an independent, i.e. simple and complex tasks and dependent variables, i.e. L2 written production and peer interaction.

The dependent variables, L2 individual writing was measured qualitatively in three sessions, i.e. individual, dyadic and triadic; in terms of lexical and syntactic Complexity, Accuracy and Fluency (CAF) and then each written quality was quantified for its frequency of occurrence. The peer interaction was measured qualitatively in dyadic and triadic sessions, in terms of Negotiation of Meaning (NoM) and Language-related Episodes (LREs) and then each type of interactional features was quantified in terms of its respective frequency of occurrence.

As for the mediating variables, the learners' cognitive systems such as attention allotment and memory resources might be directly or indirectly affected by the moderator variable when processing information in writing and ideas generation due to the effects of combined task features. It is considered as a pathway delivering the effects of the combination of task features onto the dependent variables. It explains how or why the relation between two variables differs.

With regard to the control variables, there were participant grouping formats, the sequence of task complexity, i.e. from simple to complex, the manner of participant grouping either in homogeneous or heterogeneous, topics, task types (argumentative-based topic written tasks), the time for pre-task preparation, during-task interaction, individual writing as well as participants' proficiency levels. It was identified by Kim (2009) and Robinson's

Triadic Componential Framework (see Table 2.2, p.47) that proficiency levels and task types affected the occurrences of learning opportunities through peer interaction. Any possible moderating variables, especially the proficiency levels of L2 learners were controlled as the previous literature shows that it affects the correlation and strength of the relationship between a dependent and an independent variable. Therefore, this study controlled the proficiency levels of participants by setting MUET Band 3 as the minimal entry requirement based on the preliminary findings of the pilot study.

Control variables were set due to the primary interest of this study, which is the effects of the independent variable, i.e. *task complexity* and the moderator variable, i.e. *number of participants* on the dependent variables, L2 written production (*CAF*) and interaction (*NoM, LREs* and *Uptakes*). Any confounding or extraneous variables that might potentially or indirectly affect the manipulation of the predictor variables on outcome variables were eliminated or controlled. Also, considering the average proficiency levels obtained from the 36 samples and the availability of the majority English learners with their average English proficiency levels at hand, between MUET Bands 3-6, their dyadic and triadic groupings were mostly set in homogeneous manner with the same bands; although it is known that heterogeneous groupings are more conducive in learning. However, this uncontrollable phenomenon also reflects the real-life classroom nowadays.

It is worth mentioning that planning time is one of the variables stated in Cognition Hypothesis, Triadic Componential Framework. Most of the previous studies (Ellis and Yuan, 2004; Johnson, Mercado and Acevedo, 2012; Rahimpour and Safarie, 2011; Ojima, 2006) that manipulated pre-planning time have used a duration of 10 minutes for pre-task planning (unguided strategic planning) prior to the written modality. Ten-minute is also viewed as providing the best opportunity for producing positive effects in output (Mehnert, 1998).

Other than the sequence of task design and task implementation was held constant, this study also controlled the time for pre-task preparation, during-task interaction and individual writing.

## 3.5 Research Site

A private university in Malaysia was identified as the site for this study. The data collection phase took place between 22nd January and 19th March 2018 at a private university. The lecture and tutorial classrooms were the venues for the three sessions of the experiments for audio-/video- recordings, peer discussion and L2 individual argumentative writing.

## 3.6 Participants

The study had selected first year university students who were from nine different degree majors, such as Civil Engineering, Materials and Manufacturing Engineering, Mechatronics Engineering, Chemical Engineering, Broadcasting, Graphic Design and Multimedia, Accounting, International Business and Actuarial Science. Before conducting the actual experiment, all potential participants' personal particulars were collected using participant personal particular forms to elicit their basic information like gender, proficiency levels and their first language. During the participant recruitment, they were selected from English supplementary classes, like Business English, English for Mass Communication, English for Management, English for Professionals, Oral Communication and Interpersonal Skills and Public Speaking and Oral Presentation as part of their pre-requisites.

At the start, there were 126 students volunteered to participate in the initial stage of the research, however, only 36 students were recruited as the participants of this study due to

the criteria being set in this study. Firstly, the participants should be university students whose English proficiency should be between band scores of 3 to 4 of the Malaysian University English Test (MUET). As the participants took part in this study on a voluntary basis, the researcher accepted their band scores between 3 and 6.

The descriptors of the MUET describes users with band score 3 as modest users of English language in the task performance, who sometimes use language accurately with some errors and attempt to link ideas; limited variety of sentence structures and vocabulary. Users with band score 4 are described as good users of English language in the task performance, who fairly use language accurately with some minor errors and are able to link ideas satisfactorily; have the tendency to use simple sentence structures and vocabulary.

As for users with band score 5, they are very good users of English language in the task performance, who mostly use language accurately with few minor errors and are able to link ideas effectively; use some variety of sentence structures with appropriate vocabulary. Users with band score 6 are excellent users who always use language accurately and are able to link ideas very effectively; use wide variety of sentence structures effectively with varied vocabulary (see Appendix C for further information). Secondly, the participants' availabilities to attend all three sessions of the research. In this study, three participants obtained band 3 in the MUET as modest users, 24 participants obtained band 4 in the MUET as good users, three participants obtained band 5 in the MUET as very good users while six participants obtained band 6 in the MUET as excellent users.

Due to the imbalanced number of participants of each proficiency level and their availability in participating in certain slot of each session, there was an inadequate number of participants with the advanced levels Bands 5-6 to ensure heterogeneous groupings. During the peer interaction in the dyadic and triadic sessions, some groupings were in

homogeneous while some were in heterogeneous. However, having homogenous and heterogeneous groupings in the study seems to better reflects the real-life classroom phenomenon.

In total, 36 first year university students (9 females and 27 males, between ages 21 to 24) who speak English as their Second Language (ESL) took part in the study. They have received between 11-13 years of English language education in primary and secondary schools. The general proficiency background of the first year university learners of ESL are modest to advanced users of English based on MUET band scores.

Participants with low proficiency level of Bands 1-2 were not recruited for the study back in the pilot study; it was revealed that these low proficiency L2 learners could hardly compose complete sentences in their L2 writing. For this reason, the low proficiency L2 learners produced insufficient language data for analysis. Therefore, the English proficiency of the participants for this study was set at the intermediate level as the minimal entry requirement for this experiment. Malaysian universities set a minimal requirement of English proficiency for university admission at Bands 3-4 of the Malaysian University English Test (MUET). MUET is a test of English language proficiency used by most local universities in Malaysia. The recruitment of participants for this study was also based on the availability of the university students.

It would have been appropriate if all university students across the universities in Malaysia could take part in the study. However, due to the time constraints and resources limitations inherent in this study, a non-probability sample, purpose sampling technique was employed to select participants with intermediate to advanced levels of English writing proficiency.

**3.7 Pilot Studies**

In total, three pilot studies were conducted to ensure the feasibility of the research approach in this study, such as the selection of argumentative topics and the time needed had been piloted before the actual experiment. During the pilot studies, the challenges encountered were related to the concept and design of task complexity, time for writing, and the quality of recording for verbatim transcription. One of the pilot tests was carried out to examine the selection of topics for the argumentative writing tasks for this study, the topics that can better reflect learner's life as well as are closer to their experiences are chosen.

The first pilot study was conducted between November to December in 2016 with a class of ESL diploma students to examine the feasibility of the tasks level and the suitability of the participants' proficiency levels in attempting the tasks. This was to ensure the relevance of the task complexity level to the targeted learner population. The pilot results revealed that low proficiency L2 learners, those in MUET Bands 1 and 2, could not produce enough language data to be analyzed. The final task design and its implementation are based on the outcomes of the pilot studies. For that reason, the English proficiency of the participants in this study was set at an intermediate level (Bands 3 and 4) as the minimal entry requirement for this experiment.

The second pilot study was conducted to examine the concept and design of task complexity, time for writing and the quality of recording for verbatim transcription. The third pilot test was carried out with a group of ESL learners with intermediate levels who were taking their diploma in early 2017 (see Appendix D). This was to test if the intermediate level is suitable with the designed tasks. The preliminary findings of the pilot studies showed that learners with at least MUET bands 3 to 4 produced complete argumentative writing for analysis.

Apart from that, as this study looked into the -/+ *causal reasoning demand* variable, the design of the complexity level of the argumentative writing tasks is re-modified by manipulating the number of *causal reasoning demands: causes and effects* set in the chosen topics. Initially, a *simple task* required two causes and two effects whereas a *complex task* required four causes and four effects. However, Robinson (in the personal communiation in 2017, as shown in Appendix E) suggested the simple task revised to require two causes and two effects whereas the complex tasks be revised to require six causes and six effects in the actual experiment.

As for the nature of argumentative topics selection, 22 topics were given to 96 university college students from three different majors to select topics that would prompt them to discuss further. According to Robinson (2007a), prior knowledge is a factor that might affect the cognitive complexity of tasks. Out of the 22 argumentative topics, six were selected based on students' personal experience associated with real life, their familiarity with the subject matter of the topics and their personal preference in discussing the topics. This was to control the prior knowledge variable by ensuring the participants favour all six topics.

Next, with respect to time for interactive discussion, 15 minutes was justifiable while an average of 35-40 minutes was needed for writing; therefore, an average of 40 minutes was allotted to each group: *individual*, *dyadic* and *triadic* undertaking each of the simple and complex task sessions. In order to maintain the quality of a clear audio-/ video- recording for transcription, the setting of the experiment was not designed in an actual classroom but resituated to a quiet classroom. Therefore, each group of dyads and triads was arranged in the experimental setting to carry out the tasks in a separate classroom at each time.

### 3.8 Instruments

Two different types of instruments were used during the data collection process. The first instrument was survey form (as shown in Appendix J) to collect participants' personal particulars such as gender, English proficiency levels and personal background. The second instrument was the argumentative topic tasks for discussion and writing.

#### 3.8.1 Survey Form

The purpose of the personal particular survey form given at the initial stage was to collect relevant information from the students in order to recruit volunteers in the study. The participants were recruited based on the information provided by the participants that met the criteria set in the study, i.e. proficiency level with MUET Bands between 3 to 6 and their mother tongue, which is not English.

#### 3.8.2 Argumentative Tasks

The reasons of the use of argumentative writing task in this study are twofold. Firstly, the nature of the argumentative writing task, which requires learners to use logic and reasoning to generate argument, is considered cognitively more complex as stated in Triadic Componential Framework. Secondly, argumentative writing task is a type of task, which is often used as one of the writing genres in academic writing as well as in the communicative language learning classroom, especially in Malaysian tertiary education. Argumentative-based topics were provided as the prompts for the L2 individual writing (individual, dyadic and triadic sessions) and peer interactions (dyadic and triadic sessions). Therefore, students would be more familiar with the nature of the argumentative stimulus than the use of pictures or other methods.

Long (2015) asserts that in a genuine task-based language teaching environment, tasks should be analytical by nature in order to stimulate learner's attentional mechanisms

and memory resources. Also, argumentative writing tasks allow learners to maintain different positions during the interaction in order to reach a consensus about solving a problem (Duff, 1985; Long, 1990).

In addition, Foster and Skehan (1996) stated that an argumentative-based task that consists of "critical decision-making" elements yields the most constant patterns of the linguistic features of grammatical accuracy, lexical and syntactic complexity. In cognitive psychology studies like (Ellis, 2003b; Robinson, 2001a, 2005), tasks that prompt reasoning are considered cognitively more complex than tasks with decreased reasoning demands (Halford, Cowan, & Andrews, 2007). Argumentative writing task brings out the learners' ability to understand, analyze, evaluate, explain and justify an issue when they remain on different position on a topic (Duff, 1985; Long, 1990).

There were six different versions of argumentative writing tasks, three equivalent *simple (S1, S2, S3)* and three equivalent *complex (C1, C2, C3)* levels of cognitive complexity, as shown in Appendix J. The levels of cognitive complexity, *simple* and *complex* were operationalized with the number of *causal reasoning demands* in the tasks. A simpler task was designed with *less: two causes* and *two effects* whereas a more complex task was designed with *more: six causes* and *six effects* required, as suggested by Robinson (refer to Appendix E). A version of the simple and complex tasks is given in Table 3.1.

The nature of the argumentative tasks, not only provokes learners' cognitive thinking and promotes learners' interaction, but also fulfills the criteria required in tertiary education in terms of rich tasks with higher order thinking as well as genuine task-based language teaching and learning environment. Hence, the complexity of tasks was investigated in two complexity levels: simple and complex whereas task conditions were examined in individual, dyadic and triadic conditions for the peer interactions attributed to the effects of task

complexity on L2 written linguistics measures, in terms of CAF. Task complexity was also

investigated in two different task conditions: dyadic and triadic on the participants'

interaction, in terms of NoM, LREs and uptakes of recast elicited by the argumentative topics.

**Table 3.1: A version of Simple and Complex Task Designs**

---

*Simple Task: (- Causal reasoning demand)*
Instructions:
*Please put your mobile phone on silent mode and put it aside.*
*Read and understand the following task. You are given 10 minutes to prepare your response. Use the space below to write your notes. This notepad will be handed back to the researcher.*

Tasks:
<center>"Parental pressure often does more harm than good."</center>

To what extent do you agree with the above statement? In your argument, you need to provide 2 causes and 2 effects to support your view. Discuss.

- Clearly state your stand (provide your opinion on the statement).
- Provide 2 possible causes to support your view.
- Provide a possible effect of each cause.


*Complex Task: (+ Causal reasoning demand)*
Instructions:
*Please put your mobile phone on silent mode and put it aside.*
*Read and understand the following task. You are given 10 minutes to prepare your response. Use the space below to write your notes. This notepad will be handed back to the researcher.*

Tasks:
<center>"Living together before marriage does more good than harm."</center>

To what extent do you agree with the above statement? In your argument, you need to provide 6 causes and 6 effects to support your view. Discuss.

- Clearly state your stand (provide your opinion on the statement).
- Provide 6 possible causes to support your view.
- Provide a possible effect of each cause.

---

*Note.* The simple and complex tasks were used in the first session of the experiment, individual session (see Appendix J for simple and complex tasks designed for dyadic and triadic sessions).

The instructions of the argumentative writing task explain the required number of causes and effects for two tasks in each session: two causes and two effects for a simple task and six causes and six effects for a complex task. The number of causes and effects serves as the parameters for less and more continua proposed by Robinson (2001, 2003, 2005, 2007).

## 3.9 Data Collection Procedures

Data of this study were collected in three different sessions, *individual*, *dyadic* and *triadic* (see Figure 3.4). Each session was conducted with two-week intervals to control the carryover or practice effects. Further elaboration on the data collection procedures is presented in Figure 3.5 and is explained in a greater extent in the following sections

| Participants | Weeks | Group Discussion Format | Individual Writing Tasks |
|---|---|---|---|
| | 3 | INDIVIDUAL (no discussion) | Simple 1 + Complex 1 |
| (N=36) | 6 | DYADIC (n= 18 pair discussion) | Simple 2 + Complex 2 |
| | 9 | TRIADIC (n= 12 group of three discussion) | Simple 3 + Complex 3 |

**Figure 3.4: Research Procedures**
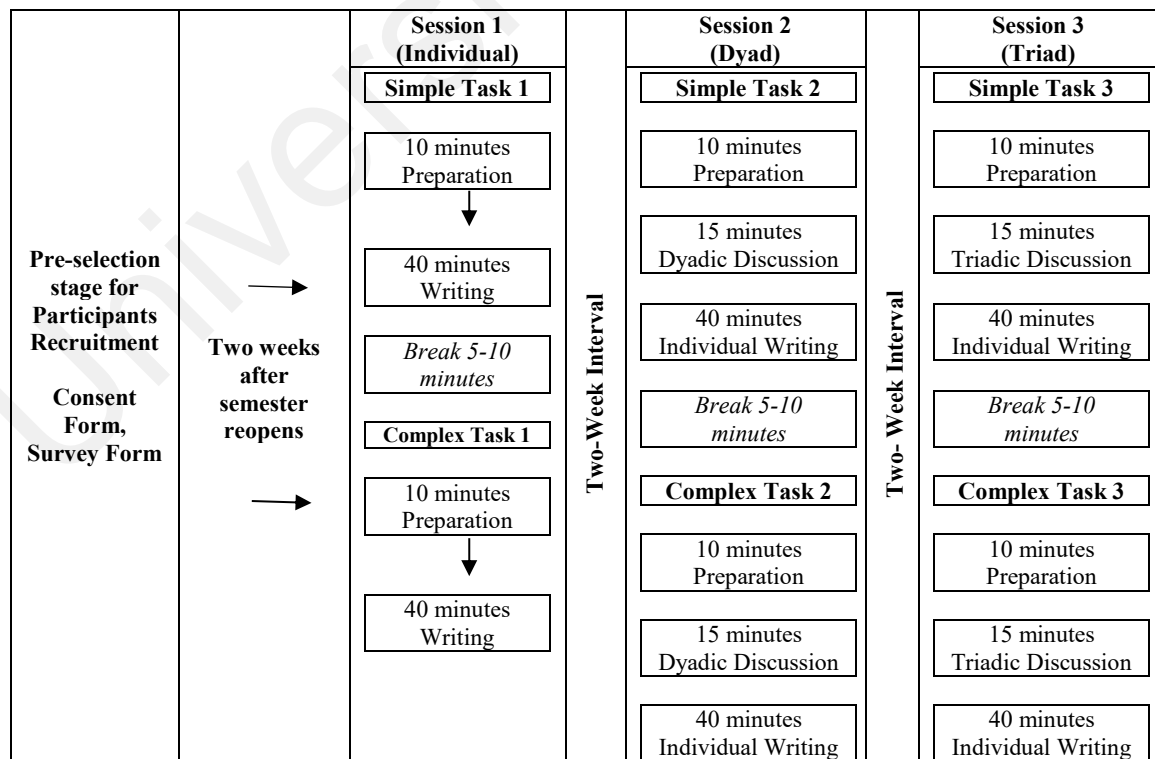


**Figure 3.5: Data Collection Procedures**

### 3.9.1 Pre-study stage

As shown in Figure 3.5, the first attempt at inviting and recruiting participants in September 2017 did not get positive response due to the short and tight semester in the October semester. The general participant particulars form was then given to the HOD of the modern languages to be passed to the respective lecturers who were teaching the English related subjects. The respective lecturers later distributed the forms to their class students who volunteered themselves to take part in the research to get their basic general information as set as the basic recruitment requirement. The participant information sheets were distributed in the class in the first two weeks of January 2018.

Also, the researcher went into a number of tutorial classes just to explain the purpose of this research project and invited the students to participate. The researcher then distributed the form (as shown in Appendix F) and requested that the students to write down their particulars. In total, there were 112 students being recruited who have shown their initial interest in this research. There were also other 14 students recruited with the help of two lecturers without my presence.

The pre-study selection stage was designed to invite, recruit and select the participants for the research based on their language proficiency levels and personal background information. The official permission to recruit participants and conduct the research at their premises was obtained from the gatekeepers of UTAR, the Dean of Faculty of Creative Industries on 15th September 2017 and the Head of Department of Department of Modern Languages (DML) on 5th October 2017 for gaining access to the participants. In order to obtain the language proficiency level of the participants for the initial entry of this experiment, the self-report sheets (as shown in Appendix F) were given to the subject

lecturers to help collect information of their students to the participants. Finally, the long-awaited first sessions of the experiment commenced on 22$^{nd}$January the following year.

From the initial stage of 126 students, only 36 students continued and completed three sessions. Due to the imbalanced number of participants with different proficiency levels, band scores 3 to 6 as well as their different availabilities in participating each session, there was an inadequate number of participants with the advanced levels of band scores 5-6 to ensure heterogeneous groupings in the dyadic and triadic sessions. Therefore, during the dyadic and triadic peer interaction, some groupings were in homogeneous while some were in heterogeneous. The uncontrollable of having homogenous and heterogeneous groupings in the study seems to reflect the real-life classroom situation.

This is a repeated-measure research study, in which, the data were collected from each participant in three sessions: session 1 labelled as individual, session 2 known as dyad and session 3 identified as triadic. Data were collected in weeks 3, 6 and 9 of one semester after two weeks of general participant particular survey form. In each of the three data collection sessions, the participants completed two argumentative writing tasks: *simple* and *complex.* In TBLT, the Cognition Hypothesis emphasizes the natural progression of learning process which can approximate real-world tasks. Moreover, as the sequence of taking the task is not part of the investigation in the study, task sequence is not counterbalanced. The argumentative writing tasks were administered in a natural progression from *simple* to *complex* to all groupings.

The actual data collection commenced two weeks after the new semester reopened, that was from 22$^{nd}$ January to 19$^{th}$ March 2018, approximately 2 months. There was a two-week interval in between each of the data collection sessions to prevent over-practice effects that might affect the internal validity of the study.

Before the commencement of the experiment, the researcher sat with each participant and explained each of the terms and conditions stated in the participant information sheet (as shown in Appendix G) at the studying area outside the library. At the same time, the participants were asked to fill out a consent form (see Appendix H) to give the researcher the permission to utilize the data obtained for research publication. In addition, the researcher answered all questions asked by the participants and explained the purpose of the study. The researcher also mentioned the contributions they would make and the benefits they would gain if they participate in this experiment. Each of the participants agreed and signed the consent form. The researcher created rapport with the participants prior to each experimental session.

In total, 36 participants performed six argumentative writings in three sessions. They completed two individual argumentative writings in each session: *individuals* in week 3, then *dyads* in week 6 and finally *triads* in week 9. As shown in the research procedures, participants working as individual during the session did not interact with others. They were given 10 minutes of pre-task preparation time to prepare for their responses for the argumentative topic. According to Skehan and Foster (1996), 10 minutes, is an unguided planning, which involves no assistance in preparing for the upcoming task, and therefore, the pre-planning time is usually given 10 minutes. The individual session serves as baseline data for writing levels. In week 6, the same group of participants first worked as dyads discussing the argumentative tasks in pairs and then only completed the writing task individually. Likewise, in week 9, the same group of participants working as triads also first discussed the argumentative tasks in groups of three, and then only completed the writing task individually.

In grouping the participants, the study attempted to apply Vygotsky's guiding principle for cognitive development, that is a heterogeneous grouping, in terms of proficiency

levels. However, due to the voluntary basis and the available proficiency levels of the participants, the group discussion format consisted of homogeneous and heterogeneous groupings. Collaborative learning still took place through transforming the socially shared ideas into internalized processes (Woolfolk & Margetts, 2012). Furthermore, the phenomenon of having homogeneous and heterogeneous groupings is better reflecting the diversity phenomenon in a real-life classroom.

### 3.9.2 First Session of the Experiment

After signing the consent form, the first task along with a notepad was given to each participant. 10 minutes of pre-task time was given to each participant to generate his or her points followed by 40 minutes of writing time. A 5-10 minutes interval break was given before continuing the second task. Light refreshment was provided. Generally, each individual took approximately one hour and fifty minutes to complete two tasks in the first, individual session. The following sub-sections explain the procedures of each experimental session.

The first session of experiment serves as the pre-test to provide the baseline data in the study. Findings from the first session were compared with that of the second and third sessions. During the *individual* session, each participant took the tasks individually. First, the researcher provided a brief instruction for the *simple* (S1) task. After that, the researcher left the room for participants to write the *simple* task. The pre-task time of 10 minutes was given for discussion while 40 minutes was allocated for each participant to write the *simple* task. During writing, participants were advised to write individually without discussion or any sort of reference. After finishing the *simple* task, the researcher went back to the classroom and collected the *simple* written argumentative task.

The participants were allowed to take a short break of five to 10 minutes before the *complex* (C1) task is briefed by the researcher. After briefing the *complex* task, the researcher again left the room for each participant to complete the *complex* task. Likewise, each participant was given 10 minutes of pre-task time and 40 minutes for writing the *complex* task. During writing, participants were again advised to write without discussion or any sort of reference. After finishing the *complex* task, the researcher went back to the room to collect the *complex* written argumentative task. Throughout the session, the researcher invigilated outside the classroom to ensure no issue of upsetting the experiment happened.

During the first session, out of the 43 participants' data, seven participants' data were disqualified because one participant left halfway through the experiment, claiming that he had an urgent matter to attend to. Two participants referred to their mobile phones while writing the essay, while four participants either took much longer than the required time to complete the essay or completed it in too short a time.

### 3.9.3 Second Session of the Experiment

After two weeks from the first session, the second session of the experiments, dyadic discussion took place between 3rd and 8th Feb in three different classrooms (as shown in Appendix I). Participants were permitted to choose a slot (date and time) that was convenient for them and select their partner for simple and complex task discussions. The time for the dyadic session to take place varied due to the unavailability of the participants and venues; only three to four slots could be arranged for the experiments to take place each day. Each dyadic grouping was placed in a classroom for peer discussion without any interruption. Each dyad took approximately two hours and twenty minutes to complete two tasks in the second, dyadic session.

During this *dyadic* session, similar to the first session, the researcher provided a brief instruction prior to the second version of *simple* (S2) and *complex* (C2) tasks because this session was different from the individual session as peer discussion was required prior to individual writing. In terms of length of time for each of the simple and complex tasks, pre-task, 10 minutes was given, peer interaction time of 15 minutes was provided while individual writing time of 40 minutes were allocated to each participant. The interval break of 5-10 minutes were provided to participants before continuing the complex (C2) task. In other words, the dyadic session was in a similar manner as the individual session except that 15 minutes of peer interaction was provided prior to individual writing. Overall, in the dyadic session, all the dyadic interactions, 18 simple discussions and 18 complex discussions were video recorded.

### 3.9.4 Third Session of the Experiment

After two weeks from the second session, the third sessions of the experiments took place between 5th and 16th March in four different classrooms at a time. Similar to the dyadic sessions, the participants chose their slot (date and time) and partner for the simple and complex tasks discussions. The time for the triadic sessions varied due to the unavailability of the participants and venues; only three to four slots could be arranged for the experiments to take place each day. Each triad took approximately two hours and twenty minutes to complete two tasks in the third, triadic session.

Participants were informed to self-select a group of three to take the tasks. Each triadic grouping was placed in a classroom for peer discussion without any interruption. During this triadic session, similar to the second session, the researcher provided a brief instruction prior to the third versions of *simple* (S3) and *complex* (C3) tasks. There were three

participants involved in the peer interaction prior to the respective individual simple and complex writings in which the same amount of time as the previous session was allocated. In terms of length of time for each of the simple and complex tasks, for pre-task, 10 minutes was given, for peer discussion, 15 minutes was provided, for individual writing time, 40 minutes were allocated for each participant. The interval break of 5-10 minutes were provided to participants before continuing the complex (C3) task. Overall, in the triadic session, all the triadic interactions, 12 simple discussions and 12 complex discussions were video recorded.

## 3.10 Data Analysis Procedures

For the written data, there are 216 argumentative written texts: 108 texts from simple (– *causal reasoning demanding*) tasks and 108 from complex (+*causal reasoning demanding*) tasks. As for the data from the interactions, in total, there are approximately 450 minutes of audio recording. There were 270 minutes from 18 groups of dyads and 180 minutes from 12 groups of triads.

### 3.10.1 L2 Individual Writing

As for the written data, the writing quality for the argumentative writing tasks was scored using the global measures of Complexities, Accuracy, and Fluency (CAF). Though CAF is not without controversy, the construct of attention allotment is operationalized with the measurement of CAF. CAF reflects learners' allotment of attention during L2 production (Robinson, 2011; Skehan, 2014). Furthermore, CAF are routinely used in high-stakes tests for decision-making about student performance in language for the purpose of accountability.

Therefore, CAF remains significant in the operationalization of theory, research and practice with regard to L2 instruction and evaluation as a whole (Housen et al., 2012).

*Complexity* relates to the way of the number of clauses the learner connects or includes within a sentence (Foster & Skehan, 1996). This construct in L2 production shows the development of the restructuring process within the L2 learners' interlanguage systems (Skehan, 1996). *Accuracy* refers to the learner's ability to exercise the maximum level of control to prevent errors during a language performance (Ellis, 2003b). *Fluency* refers to the learners' global language proficiency (Housen et al., 2012) and the learner's ability to use the language with a high number of words (Larsen-Freeman, 2006). The following sub-sections describe the operationalization of the multi-dimensional linguistic global measures for *complexity*, *accuracy* and *fluency*.

### 3.10.1.1 Complexity (Lexical and Syntactic)

This study adopted Web-based Lexical and Syntactic Complexity Analysers to measure lexical and syntactic complexities of the L2 individual writing in the simple and complex tasks performed in individual, dyadic and triadic sessions. The lexical complexity was analysed in terms of Mean Segmental Type/Token Ratio (MSTTR), whereas the syntactic complexity was analysed in terms of Mean Length of Clause (MLC), Dependent Clause per Clause (DCC) and Coordinate Phrase per T-unit (CPT).

### 3.10.1.1.1 Web-based Lexical Complexity Analyser

To analyse lexical complexity in this study, the Web-based Lexical Complexity Analyser (LCA) was used as a research tool to count the complexity of words in every 50-

word range. The web-based lexical complexity analyser is a tool developed by Lu (2012) that assists language teachers and researchers to analyse the lexical complexity of English language written texts. To measure the lexical complexity of the L2 written text with the web-based LCA, the total of 216 participants' L2 individual handwritten texts were first typed using Microsoft Word.

Then, each typed text input was transferred to the available interfaces on the website (a sample of the typed input on the interfaces is shown in Figure 3.6). In this study, both simple and complex typed texts were run at the same time in order to compare their lexical complexity. Later, the researcher chose the required measure from the indices and clicked on the "submit" button (as shown in Figure 3.7) for part-of-speech (POS) lemmatization purposes (Ai & Lu, 2010; Lu, 2012). Lastly, a graphical representation of the visualization and numeric results were generated (as shown in Figure 3.8).

Although there are 25 different measures of lexical density, variation and sophistication available for the second language development literature, this study only adopted Mean Segmental Type Token Ratio-50 (MSTTR-50) to measure the lexical complexity of the L2 individual writing based on the commonly-adopted measure reviewed in the TBLT literature (Ellis and Barkhuizen, 2005).

**Step 1: Enter text #1**

In this advance technology era, things get more complicated and competition between people occurs. The best example is the pressure given to the new generation. This problem cannot be ignored and must be treated seriously.      Parents always want their children to be the best as they have high hope on their children. This is the main reason causing the pressure to the youngsters. Since the education system is improving and some of the parents do not have the opportunity to study. These factors make the parents want their children to do better in their future and this causes the most parental pressure to this problem.      The next cause of the problem is the competition among the kids. As we know, giving the chance to the youngsters to learn earlier is good but not giving excessive homework or tuition classes to them. For example, forcing their children to o to tuition classes even when they are just four or five years old. The childhood is the best period in our entire life, we cannot just ruin it by giving them so much pressure. Some parents are trying to compete their children with others and this must be avoided. From the pressure above, there are some effects would occur. The first one is the youngsters would get emotional easily, stress an unhappy. These are just the beginning and would get worse if do not treated seriously. If the kids still unable to find their way out of it, some suicidal cases or run away from home cases would happen.      Moreover, the parental pressure will also affect the youngsters' future. As most

**Enter text #2 (optional)**

Nowadays, living together before marriage is common and I think this does more good than harm for us. As marriage is an important event and we do not want to screw it up. Therefore, living together before marriage is actual a good choice and here are the reasons why.  Living together before engage, we get to know each other behavior more deeply. This can stabilize the marriage after we agree to engage. The housework is one big problem for the couple. But with living together, we can distribute and share the task together to prevent all the conflicts from happening.      Living together can strengthen the relationship compare to living separately. As we get to see each other every day and talk to each other everyday. This also help in building the foundation of the marriage. Next, a lot of couples see the problems only after they living in a same house. This is the best options to test whether the couple is suitable. This will prevent divorce from happening.      Instead of building foundation of marriage, living together also help in planning for future. Therefore, the couple able to set up a good and warm family in the future. The last cause is the most important one which is taking care of each other. As living together, you are the closet person to your partner. This is the best way to strengthen the relationship and protect the marriage from breaking up.      From the points above, we can conclude that living together does more good than harm. This is very important for every couple as it helps a lot in building

**Figure 3.6: Web-based Lexical Complexity Analyzer (LCA) Interface with Typed L2 Individual Writing**

**Step 2: Select indice(s)**

Lexical density (LD)
**Lexical Sophistication**
  Lexical sophistication-I (LS1)
  Lexical sophistication-II (LS2)
  Verb sophistication-I (VS1)
  Verb sophistication-II (VS2)
  Corrected VS1 (CVS1)
**Lexical Variation**
  **NDW**
    Number of different words (NDW)
    NDW (first 50 words) (NDWZ-50)
    NDW (expected random 50) (NDW-ER50)
    NDW (expected sequence 50) (NDW-ES50)
  **TTR**
    Type/Token ratio (TTR)
    Mean Segmental TTR (50) (MSTTR-50)
    Corrected TTR (CTTR)
    Root TTR (RTTR)
    Bilogarithmic TTR (logTTR)
    Uber Index (Uber)
  **Verb diversity**
    Verb variation-I (VV1)
    Squared VV1 (SVV1)
    Corrected VV1 (CVV1)
  **Lexical word diversity**
    Lexical word variation (LV)
    Verb variation-II (VV2)
    Noun variation (NV)
    Adjective variation (AdjV)
    Adverb variation (AdvV)
    Modifier variation (ModV)

**Step 3: Select English Variety:**

British English ▼

Submit

**Figure 3.7: 25 Indices for Lexical Complexity and the Selection of English Variety**

Visualization

Lexical complexity indice(s)
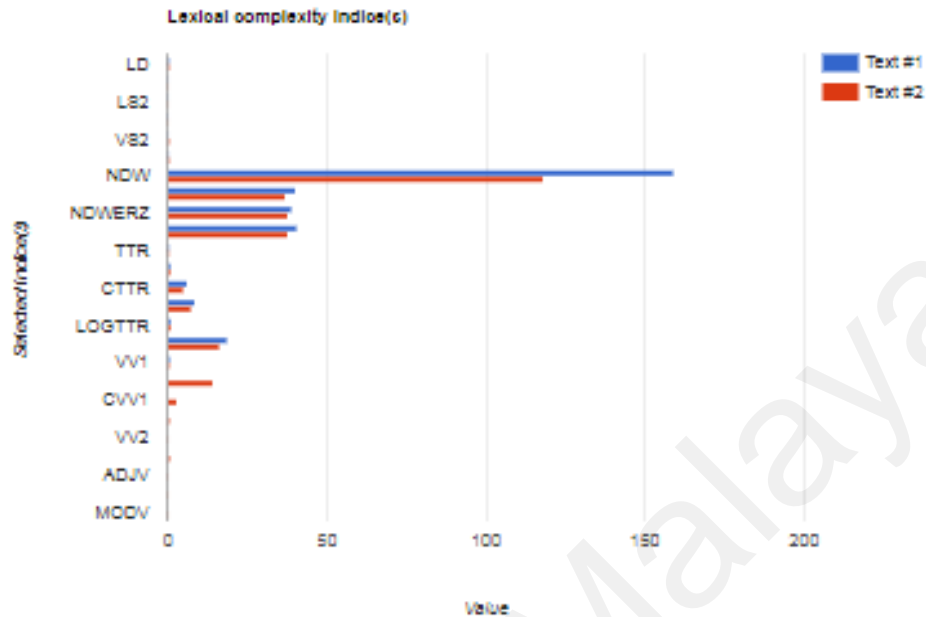


Numeric Results

The following tabular results can be copied and pasted into a plain text file, and subsequently imported into speedsheet or database software for further processing and analysis.

Text #1

LD, LS1, LS2, VS1, VS2, CVS1, NDW, NDWZ, NDWERZ, NDWESZ, TTR, MSTTR, CTTR, RTTR, LOGTTR, UBER, VV1, SVV1, CVV1, LV, VV2, NV, ADJV, ADVV, MODV
0.50, 0.19, 0.16, 0.07, 0.20, 0.32, 159, 40, 38.80, 40.60, 0.44, 0.79, 5.93, 8.39, 0.86, 18.46, 0.64, 18.69, 3.06, 0.62, 0.16, 0.56, 0.14, 0.08, 0.22

Text #2

LD, LS1, LS2, VS1, VS2, CVS1, NDW, NDWZ, NDWERZ, NDWESZ, TTR, MSTTR, CTTR, RTTR, LOGTTR, UBER, VV1, SVV1, CVV1, LV, VV2, NV, ADJV, ADVV, MODV
0.53, 0.14, 0.15, 0.11, 0.53, 0.52, 118, 37, 37.70, 37.70, 0.43, 0.76, 5.05, 7.14, 0.85, 16.29, 0.55, 14.38, 2.66, 0.58, 0.18, 0.64, 0.09, 0.11, 0.20

**Figure 3.8: Data Visualization and Numeric Results for Lexical Complexity**

**3.10.1.2 Web-based Syntactic Complexity Analyser**

With regard to the analysis of syntactic complexity, the web-based Syntactic Complexity Analyser (SCA) is another research tool adopted in this study to count the multi-dimensional syntactic complexity, that is, MLC, DCC and CPT. The web-based syntactic

complexity analyser is a tool that assists language teachers and researchers to analyze the syntactic complexity of English language written texts.

To measure the syntactic complexity of the L2 written text, both simple and complex typed texts (a sample of the typed input on the interfaces is shown in Figure 3.9) were run at the same time to compare their syntactic complexity. Later, the researcher chose the required measure from the indices and clicked on the "submit" button (as shown in Figure 3.10) to analyse the length of the production units, amounts of coordination, amounts of subordination, degree of phrasal sophistication as well as the overall sentence complexity (Lu, 2010, 2011; Lu & Ai, 2013, 2015). Lastly, data visualization and numeric results were generated (as shown in Figure 3.11).

Despite there are 14 different measures of syntactic density, variation and sophistication available for the second language development literature, this study only adopted Mean Length of Clause (MLC), Dependent Clause per Clause (DCC) and Coordinate Phrases per T-unit (CPT) to measure the syntactic complexity of the L2 individual writing. These measures were based on the commonly-adopted measure reviewed in the TBLT literature (Rahimi, 2018).

In this advance technology era, things get more complicated and competition between people occurs. The best example is the pressure given to the new generation. This problem cannot be ignored and must be treated seriously.

Parents always want their children to be the best as they have high hope on their children. This is the main reason causing the pressure to the youngsters. Since the education system is improving and some of the parents do not have the opportunity to study. These factors make the parents want their children to do better in their future and this causes the most parental pressure to this problem.

The next cause of the problem is the competition among the kids. As we know, giving the chance to the youngsters to learn earlier is good but not giving excessive homework or tuition classes to them. For example, forcing their children to o to tuition classes even when they are just four or five years old. The childhood is the best period in our entire life, we cannot just ruin it by giving them so much pressure. Some parents are trying to compete their children with others and this must be avoided.

From the pressure above, there are some effects would occur. The first one is the youngsters would get emotional easily, stress an unhappy. These are just the beginning and would get worse if do not treated seriously. If the kids still unable to find their way out of it, some suicidal cases or run away

Step 2: Enter text #2 (Optional)

Nowadays, living together before marriage is common and I think this does more good than harm for us. As marriage is an important event and we do not want to screw it up. Therefore, living together before marriage is actual a good choice and here are the reasons why.

Living together before engage, we get to know each other behavior more deeply. This can stabilize the marriage after we agree to engage. The housework is one big problem for the couple. But with living together, we can distribute and share the task together to prevent all the conflicts from happening.

Living together can strengthen the relationship compare to living separately. As we get to see each other every day and talk to each other everyday. This also help in building the foundation of the marriage. Next, a lot of couples see the problems only after they living in a same house. This is the best options to test whether the couple is suitable. This will prevent divorce from happening.

Instead of building foundation of marriage, living together also help in planning for future. Therefore, the couple able to set up a good and warm family in the future. The last cause is the most important one which is taking care of each other. As living together, you are the closet person to your partner. This is the best way to strengthen the relationship and protect the marriage from breaking up.

From the points above, we can conclude that living together does more good than harm. This is very

**Figure 3.9 Web-based Syntactic Complexity Analyzer (SCA) Interface with Typed L2 Individual Writing**

Step 3: Select measure(s)

**Syntactic structures**
Word count (W)
Sentence (S)
Verb phrase (VP)
Clause (C)
T-unit (T)
Dependent clause (DC)
Complex T-unit (CT)
Coordinate phrase (CP)
Complex nominal (CN)
**Syntactic complexity indices**
Mean length of sentence (MLS)
Mean length of T-unit (MLT)
Mean length of clause (MLC)
Clause per sentence (C/S)
Verb phrase per T-unit (VP/T)
Clause per T-unit (C/T)
Dependent clause per clause (DC/C)
Dependent clause per T-unit (DC/T)
T-unit per sentence (T/S)
Complex T-unit ratio (CT/T)
Coordinate phrase per T-unit (CP/T)
Coordinate phrase per clause (CP/C)
Complex nominal per T-unit (CN/T)
Complex nominal per clause (CN/C)

*Tip: Press CTRL or SHIFT to select multiple measures.*

Analyze

**Figure 3.10 14 Indices for Syntactic Complexity**

Visualization

Indice(s) of Syntactical Complexity
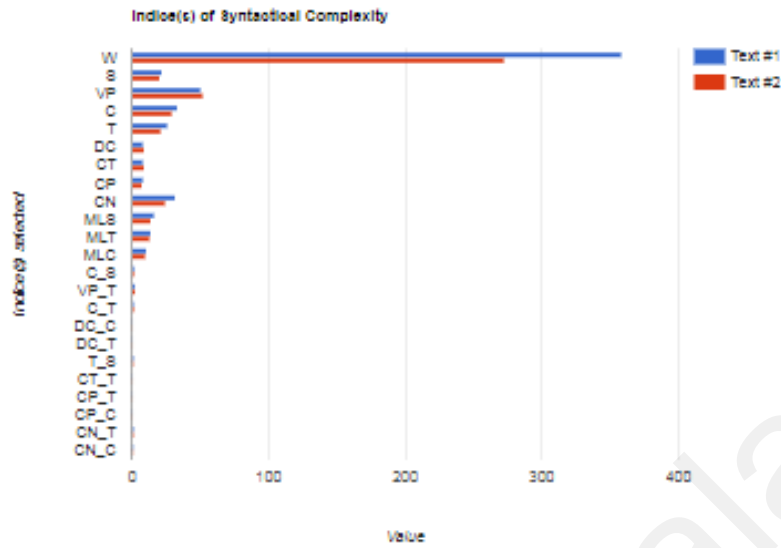


Tabular Results

The following tabular results can be copied and pasted into a plain text file and subsequently imported into spreadsheet or database software for statistical analysis.

Text #1
W, S, VP, C, T, DC, CT, CP, CN, MLS, MLT, MLC, C/S, VP/T, C/T, DC/C, DC/T, T/S, CT/T, CP/T, CP/C, CN/T, CN/C
359, 22, 50, 33, 26, 8, 8, 8, 32, 16.3182, 13.8077, 10.8788, 1.5000, 1.9231, 1.2692, 0.2424, 0.3077, 1.1818, 0.3077, 0.3077, 0.2424, 1.2308, 0.9697

Text #2
W, S, VP, C, T, DC, CT, CP, CN, MLS, MLT, MLC, C/S, VP/T, C/T, DC/C, DC/T, T/S, CT/T, CP/T, CP/C, CN/T, CN/C
273, 20, 52, 29, 21, 9, 9, 7, 24, 13.6500, 13.0000, 9.4138, 1.4500, 2.4762, 1.3810, 0.3103, 0.4286, 1.0500, 0.4286, 0.3333, 0.2414, 1.1429, 0.8276

Computed in 12.13868 seconds.

**Figure 3.11 Data Visualization and Numeric Results for Syntactic Complexity**

As presented in Figure 3.12, an L2 learner wrote the simple writing task, entitled *Parental pressure often does more harm than good* during the first session of the experiment, an individual session. The web-based lexical and syntactic complexity analyser analysed the L2 writing in terms of lexical and syntactic complexities as shown in Figures 3.13 and 3.14. The results in bold indicate the findings for the lexical complexity, in terms of MSTTR-50, as well as syntactic complexity, in terms of MLC, DCC and CPT.

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In this advance technology era, things get more complicated and competition between people occurs. The best example is the pressure given to the new generation. This problem cannot be ignored and must be treated seriously.

Parents always want their children to be the best as they have high hope on their children. This is the main reason causing the pressure to the youngsters. Since the education system is improving and some of the parents do not have the opportunity to study. These factors make the parents want their children to do better in their future and this causes the most parental pressure to this problem.

The next cause of the problem is the competition among the kids. As we know, giving the chance to the youngsters to learn earlier is good but not giving excessive homework or tuition classes to them. For example, forcing their children to tuition classes even when they are just four or five years old. The childhood is the best period in our entire life, we cannot just ruin it by giving them so much pressure. Some parents are trying to compete their children with others and this must be avoided.

From the pressure above, there are some effects would occur. The first one is the youngsters would get emotional easily, stress an unhappy. These are just the beginning and would get worse if do not treated seriously. If the kids still unable to find their way out of it, some suicidal cases or run away from home cases would happen.

Moreover, the parental pressure will also affect the youngsters' future. As most of the parents wanted their children to become a doctor, lawyer or some well-paid job. This will eventually destroy their dream to get the job that they are interested in. They might regret after they grow up and hate their parents by forcing them to reach their expectations.

As a conclusion, education is important to the kids but over amount of homework or classes will cause a lot harmful effects to the new generation. Pushing the children to a better future is good but not forcing them.

**Figure 3.12: A Sample of an L2 Individual Writing**

*Note.* A sample taken from a simple task in an individual session, entitled *Parental pressure often does more harm than good.*

**Lexical Complexity.005.Ind.**

Text #1

LD, LS1, LS2, VS1, VS2, CVS1, NDW, NDWZ, NDWERZ, NDWESZ, TTR, **MSTTR**, CTTR, RTTR, LOGTTR, UBER, VV1, SVV1, CVV1, LV, VV2, NV, ADJV, ADVV, MODV
0.50, 0.19, 0.16, 0.07, 0.20, 0.32, 159, 40, 36.70, 38.30, 0.44, **0.79**, 5.93, 8.39, 0.86, 18.46, 0.64, 18.69, 3.06, 0.62, 0.16, 0.56, 0.14, 0.08, 0.22

**Figure 3.13: A Sample of Lexical Complexity Results Measured by the Web-based Lexical Complexity Analyser**

*Note.* MSTTR indicates Mean Segmental Type/ Token Ratio.

```
Syntactic Complexity.005.Ind.

Text #1

W, S, VP, C, T, DC, CT, CP, CN, MLS, MLT, MLC, C/S, VP/T, C/T, DC/C, DC/T, T/S, CT/T, CP/T, CP/C, CN/T,
CN/C
354, 22, 50, 34, 26, 8, 8, 8, 32, 16.3182, 13.8077, 10.8788, 1.5000, 1.9231, 1.2692, 0.2424, 0.3077,
1.1818, 0.3077, 0.3077, 0.2424, 1.2308, 0.9697
```

**Figure 3.14: A Sample of Syntactic Complexity Results Measured by the Web-based Syntactic Complexity Analyser**

*Note*. W indicates Words, C indicates Clauses, T indicates T-units, MLC indicates Mean
Length of Clause, DC/C indicates Dependent Clause per Clause, CP/T indicates
Coordinate Phrase per T-units

### 3.10.1.2 Accuracy: Error-Free Clause (EFC)

With respect to the measure of accuracy in the L2 individual writing, it was analysed

manually as to date, there is no any artificial intelligence can completely detect and analyse

the accuracy of a language. A clause can be defined as an independent clause; a main or

coordinate clause is a grammatical structure, which contains a subject and a verb. It can stand

on its own. A dependent clause, such as subordinate clause is a clause, which contains a finite

or a non-finite verb and at least one additional clause elements: subject, object, complement

or adverbial. It does not express a complete thought so it is not a sentence and it does not

stand alone. In this study, any unit of grammatical structure which contains a subject and a

verb is counted as a clause.

The global linguistic measure, accuracy was measured with the dimension of error-

free clause. The following guidelines adopted from Storch (2005) served as the parameters

used in this study determining what is error and what is error-free clause. In this study, tense,

aspect, mood or verb formation errors are counted as one error. Tense and aspect are coded

based on the discourse and its context rather than looking at a sentence in isolation. For

instance, "… encouragement can pushes children…" is counted an error, the verb *pushes* should be in its base form, *push* after the auxiliary *can*.

Error-free units consider any T-unit or clause that is semantically sensible and is perfect in syntactical and lexical aspects, excluding spelling and punctuation. The *number of errors* is coded based on minimal number of corrections required to make the clause error free. Punctuations and spelling are not counted as errors. For instance, "… encouragement can *pushes* children to a greater extend *in* what they are interested *with*" is counted as 1 error, instead of three errors. The aforementioned clause is counted as 1 error although three errors are found in the sentence, *pushes- push*; *extent in- extent to*; *interested with- interested in*.

The spelling mistake, *extend- extent* is not counted as an error. For instance, *Even though* occasionally they might perform several mistakes/, *but* their parents will always be able to spot them on time/. The symbol / indicates a clause is marked. "*Even though… but*" were used redundantly in each clause, it is still counted as only 1 error because it refers to a thought.

*Articles* errors are coded as an error with proper or specific nouns and expression. *Unnecessary/ Omitted plural markers* are coded as an error, like *evidences* when a noun like *evidence* is not supposed to take a plural s but is pluralized. Omitted plural markers are coded as an error when a noun like "three person" does not take a plural s, "three persons". *Word choice* is counted as errors only when the chosen word expression distorts meaning or is considered incontrovertibly wrong. For instance, "… promote the growth of the children mentally, spiritually and technically", the use of *technically* distorts the meaning of the phrase, therefore, it is counted as one error in expression.

As for the measure of the L2 individual written accuracy, the dimension of EFC was adopted due to the commonly adopted measure in the existing literature. The error-free clauses were measured with the following formula:

*Error-free clauses /Total of clauses*

The following written text is the same sample as shown in Figure 3.12, entitled "Parental pressure often does more harm than good". It was measured with error-free and with error clasuses. In total, there are 34 clauses produced in this written text.

In this advance technology era, /things get more complicated/ (+) and /competition between people occurs/ (+). /The best example is the pressure given to the new generation/ (+). /This problem cannot be ignored and must be treated seriously/ (+).

(+) 4//, Total: 4//

/Parents always want their children to be the best/ (+) as /they have high hope on their children/ (+). /This is the main reason causing the pressure to the youngsters/ (-). Since /the education system is improving/ (+) and /some of the parents do not have the opportunity to study/ (+). /These factors make the parents want their children to do better in their future/ (+) and /this causes the most parental pressure to this problem/ (-).

(+) 5//, (-) 2//, Total: 7 //

/The next cause of the problem is the competition among the kids/ (+). As /we know/ (+), /giving the chance to the youngsters to learn earlier is good but not giving excessive homework or tuition classes to them/ (+). For example, forcing their children to tuition classes even when /they are just four or five years old/ (-). /The childhood is the best period in our entire life/ (-), /we cannot just ruin it by giving them so much pressure/ (+). /Some parents are trying to compete their children with others/ (+) and /this must be avoided/ (+).

(+) 6 //, (-) 2//, Total= 8 //

From the pressure above, /there are some effects would occur/(+). /The first one is the youngsters would get emotional easily, stress and unhappy/ (-). /These are just the beginning and would get worse/ (+) if /do not treated seriously/ (-). If /the kids still unable to find their way out of it/ (-), /some suicidal cases or run away from home cases would happen/ (+).

(+) 3 //, (-) 3 //, Total= 6 //

Moreover, /the parental pressure will also affect the youngsters' future/ (+). /As most of the parents wanted their children to become a doctor, lawyer or some well-paid job/ (-). /This will eventually destroy their dream to get the job/ (-) that /they are interested in/ (+). /They might regret/ (+) after /they grow up and hate their parents by forcing them to reach their expectations/ (-). 6 //

(+) 3 //, (-) 3 //, Total= 6 //

    As a conclusion, /education is important to the kids/ (+) but /over amount of homework or classes will cause a lot harmful effects to the new generation/ (-). /Pushing the children to a better future is good but not forcing them/ (-). 3 //

(+) 1 //, (-) 2 //, Total= 3 //

<div align="center">

*Error-free clauses /Total of clauses*
Error-free clauses: 22/34= 0.617

</div>

*Note.* // indicates a clause, + indicates error-free, - indicates with error

### 3.10.1.3: Fluency: Word/ T-unit (W/T)

This study adopted Larsen-Freeman (2006) definition of fluency, which considers the number of words in the language production, that is, the total length of the text and the total number of words per T-units. A *T-unit* is defined as an independent clause and all its dependent clauses attached or embedded in it (Hunt, 1964). For instance, *Nowadays, they take education as the path of getting a high paid job/| and I can't deny the fact/ that education is important./* In this sentence, there are 2 T-units and 3 clauses. The symbol | indicates a T-unit is marked whereas the symbol / indicates a clause is marked.

Instead of counting the number of T-units manually, this study adopted Web-based Syntactic Complexity Analyser to calculate the number of T-units of each written text. For instance, the results of the extracted L2 written text measured by the analyser as shown in Figure 3.14 consists of 26 T-units and 345 words. The measure of fluency was measure with total number of words in a written text per total number of T-units of a written text, which is 354/ 26.

### 3.10.1.4: Text Length

The text length of the L2 individual writing was measured with the mean length of all the text length. As shown in Figure 3.14, the total number of words in the written text shown in Figure 3.12 is 354 words. The total number of words for each of the simple and complex written texts was totaled up respectively. Then, each was divided by the total number of written texts produced in simple and complex tasks respectively. For instance, in the individual session, 36 participants produced 36 written texts with different number of words for each text for the simple task, thus, the measure for the text length for the individual simple task would be, (36 simple tasks x total number of words of each written text) divided by 36. As for the complex task in the individual session, same measurement applied, that is (36 complex tasks x total number of words of each written text) divided by 36. For the dyadic session, it was measured with (36 simple tasks x total number of words of each written text) divided by 36 for the simple task whereas (36 complex tasks x total number of words of each written text) divided by 36 for the complex task. In the triadic session, (36 simple tasks x total number of words of each written text) divided by 36 for the simple task whereas (36 complex tasks x total number of words of each written text) divided by 36 for the complex task.

Overall, two inter-rater and inter-coder agreements were checked with a random sample of 10 sets of written texts and transcribed interactions respectively. The second inter-rater reliability was between 86% and 94% identifying CAF whereas the second inter-coder reliability was between 83% and 87% identifying NoM, LREs and Uptake of recast. After quantifying the occurrences of dependent variables of spoken interaction and the measures for written quality (complexity, accuracy, and fluency), the results were computed into Statistical Package Social Science (SPSS), with two-way repeated measure ANOVA.

### 3.10.2 Peer Interaction

Following the previous literature, this study transcribed the video-recording of peer discussions verbatim and then coded the transcription according to NoM, LREs and Uptake of recast. The qualitative interactional measures such as negotiation of meaning (Long, 1983), LREs (Swain & Lapkin, 1998), and the sub-categories of LREs: recast (Nicholas et al., 2001) and self-/other-repairs (Kormos, 1999) and uptake of recast (Robinson, 2010). The qualitative data was then quantified. The following table shows the interactional features for NoM, LREs and Uptakes of recast:

### 3.10.2.1 Negotiation of Meaning (NoM)

Negotiation of meaning (Long, 1983; 1996) is a conversational phenomenon when an interlocutor, in this study, a learner, does not seem to understand what has been said in the conversation and causes a breakdown during the process of communication, the listener or the speaker learner uses communicative strategies, such as negotiating for meaning or content to help the interaction progress. Most importantly, NoM is used to enhance the comprehension of the interlocutors in the conversation.

According to Long (1996), NoM provides learning opportunities to L2 learners in which they can improve their comprehensibility of input, enhance their attention and create the need to produce output. The following interactional features, *clarification requests, confirmation checks*, and *comprehension checks* are the commonly found features during the peer interaction that involves NoM communicative strategy:

### 3.10.2.1.1 Clarification Requests

When negotiating for meaning, listener learners tend to indicate that they do not understand the preceding utterance by the speaker learners. Thus, they clarify the meaning of the preceding utterance with the speaker learner, with the interactional features like requesting for clarification, in a question form, such as *Excuse me? Can you run that again for me?* Or in an imperative manner, such as *I don't understand, please explain*. Table 3.2 is the example of clarification check extracted from the dyadic grouping.

**Table 3.2: A sample of Clarification Request for Verbatim Transcription**

| |
|---|
| J     : I think the cane will be their friend |
| YJ   : *The what?* |
|        (*Clarification request*) |
| J     : Canning <hand gestures of canning> |
| YJ   : *What did you mean 'k'?* |
|        (*Clarification request*) |
| J     : Cane  <wrote the word on the paper> teng bian… <in Chinese Mandarin, teng bian means cane> |
| YJ   : Oh! I thought that is "ganzhe" in Chinese mandarine sugar cane [hahaha] |

*Note.* Both L2 learners, J and YJ were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.1.2 Confirmation Checks

In addition, the interactional phenomenon such as confirmation checks is a conversational phenomenon when a learner seeks confirmation of other's preceding utterance. This interactional feature is to ensure that he or she has heard the utterance precisely from the speaker. The learner who seeks confirmation tend to raise the intonation and ask questions or repeat certain words of the utterance, for example, speaker A says *The bridge is collapsed*, but speaker B confirmed the utterance heard by repeating the words in

the utterance, such as *The bridge*? *The bridge*, *right*. Table 3.3 shows the example of a confirmation check from a dyadic grouping:

**Table 3.3: A sample of Confirmation Check for Verbatim Transcription**

| | |
|---|---|
| YH | : It's like.., if you have.. if you are having good grades, but you don't have some kind of team work and communication skill.. I think it will be hard for you to work with.. with other peoples, actually they will help you to suc… to success.. |
| TY | : *You mean* soft skill ar? (*Confirmation check*) |
| YH | : Yea.. [can say] |
| TY | : [Soft skill].. soft skill |
| YH | : I think it's different from first point *right*? (*Confirmation check*) |
| TY | : Yea, this different la.. and communication skill |

*Note.* Both L2 learners, YH and TY were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.1.3 Comprehension Checks

Comprehension checks is a conversational phenomenon in which a learner checks the understanding of another learner about his or her preceding utterance, if another learner has understood the message of his or her preceding utterance. Comprehension checks is a conversational phenomenon that ensures others have understood the speaker learner's utterance. The interactional features of such kind are "*Do you understand what I have just said?*" or "*Do you get it?*". Table 3.4 shows the example of confirmation check.

**Table 3.4: A sample of Comprehension Check for Verbatim Transcription**

| | |
|---|---|
| ZS | : There are people in so many range la, the range uh. the ranging from doing good stuff, to doing not so good stuff, then increasing serenity of doing bad stuff. So, this is doing good stuff, this is doing really bad stuff, in the middle there is like a grey area la, where you call it grey area, so, let's say that uh.. every single parent, some parent a bit more restrictive, might be uh towards the good area, some parents give more freedom, so they are more, towards the uh like the thethe bad area, so, for me leh, the boundary, okay, how do you say a boundary, there are no ss..  there are not exact rules.. so, how you set your boundary and the boundary are will where wherewhere will.. |
| HR | : Yea..uhm.. let me get back to you after my drink… |

Table 3.4 Continued.

| XY | : Mm.. |
|---|---|
| ZS | : You shouldn't.. right, if you setting a boundary, you shouldn't set like a boundary, like a like a like a like a line that you tell your kids, okay you should not cross that line, you should set like an area like, like *do you get what I mean*? (*Comprehension check*) |

*Note.* Three L2 learners, HR. ZS and XY were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.


### 3.10.2.2 Language-Related Episodes (LREs): Recast

Language-related episodes are a conversational phenomenon in which learners discuss the language they are producing, question their language use or correct themselves or others (Swain & Lapkin, 1998). It is claimed that LREs serve as a role of a mediator of second language learning (Lantolf, 2014) because learners use language to mediate their language use during the peer interaction.

The commonly found features of LREs in the learners' interaction are lexical-based LREs and form-based LREs. This study focused on the lexical-based and form-based LREs, as shown in Table 3.5:


**Table 3.5: A sample of Lexis- and Form-based LRE Recast for Verbatim Transcription**

| A | : How do you say kids under 6 years old… |
|---|---|
| B | : *Toddlers*.. (*Lexis-based LRE recast*) |
| A | : When Ben walk through the underbridge.. She got robbed there… What is past tense for walk? |
| B | : *Walked*. And Ben is a male name, so it should be *He* (reflexive pronoun)… |
| A | : When Ben walked through the underbridge, he got robbed there.. (*Form-based LRE recast*) |

In this study, the results of the language-related episodes found are analysed and reported accumulatively. Like it is noted in collaborative dialogic studies (Egi, 2004), there are some other interactional features that discuss the language itself but do not triumphantly resolve the language issues. Table 3.6 shows the example of LRE recast from a dyadic grouping whereas Table 3.7 shows the example of LRE recast made in the first language (L1).

**Table 3.6: A sample of LRE-Lexical Recast for Verbatim Transcription**

| | |
|---|---|
| JX | : It's like… |
| F | *: Slow process*? Stubborn is "gu zhi" ar? <br> <gu zhi is stubborn in Chinese Mandarin> |
| JX | : Yea, stubborn is guzhi… *less responsive*? <br> (*LRE: lexical recast the slow process mentioned by F*) |
| F | : Oh yea… |
| JX | : Less responsive can be like, less responsive can bring to the second point. If they use a lot of time to like Facebooking, they will like less responsive to like… |

*Note.* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 3.7: A sample of LRE-Lexical Recast in L1 for Verbatim Transcription**

| | |
|---|---|
| J | : Yea, like especially mmm how to say in Malaysia, maybe many children especially parent like.. just want them to focus on study and then [study is everything for them] |
| YJ | : [Send them home tuition]…ah…if they don't get well ah… |
| J | : I think the cane will be their friend |
| YJ | : The what? |
| J | : Canning <hand gestures of canning> |
| YJ | : What did you mean :K"? |
| J | : cane  <wrote the word on the paper>.. *teng bian* <in Chinese Mandarin, teng bian means cane> <br> (*LRE: lexical recast in L1*) |

*Note. Note:* Both L2 learners, J and YJ were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

Extracted from a dyadic peer interaction, the LRE- lexical recast was in L1.

### 3.10.2.2.1 Correctly Resolved Recast

Language-related episodes that are correctly resolved are conversational phenomena in which learners correctly resolved the language they are having problems with. Recast is considered as part of the LREs as it is an accurate rewording of a learner's inaccurately created statement (Nicholas et al., 2001). There are self-repair LREs when the inaccurate repairs are initiated by the speaker or others due to the consequences of ill-formed morphology, syntax, lexicon or phonology (Kormos, 1999). Table 3.8 shows the example of a self-correctly resolved LRE recast from a dyadic grouping.

**Table 3.8: A sample of LRE- Correctly Resolved Lexical Recast for Verbatim Transcription**

| |
|---|
| YJ    : Mmm.. maybe they feel that they are superior… feeling they are more superior *than other* la, |
| J     : Mm.. They are more smart than other, they are better than others |
| YJ    : Yea, *how to say this one*? Ah..*comparative.*.ah<br>(*Lexis-based LRE: self-recast: Correctly Resolved*) |

*Note*. Both L2 learners, J and YJ were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.2.2  Partially/ Incorrectly Resolved Recast

Partially or incorrectly resolved language-related episodes are conversational phenomena where learners only manage to partially resolve the language they are having problems with or learners attempted to resolve the language they are having problems with but unsuccessfully. Table 3.9 shows the example of a partially or incorrectly resolved LRE recast from a dyadic grouping.

**Table 3.9: A sample of LRE- Partially/ Incorrectly Resolved Lexical Recast for Verbatim Transcription**

| | |
|---|---|
| YJ | : Mmm.. maybe they feel that they are superior, Feeling they are more superior than other la, |
| J | : Mm.. They are more smart than other, they are better than others |
| YJ | : Yea, how to say this one? Ah..comparative..ah |
| J | : *Over competition..* gila? |
| | <gila is a word in Malay language, means crazy> |
| | (*LRE: lexical recast partially resolved with over competition, instead of over-competitive*) |
| YJ | : <whispering while writing: "over competition in…"> |
| J | : …in study, school, school life… |

*Note*. Both L2 learners, J and YJ were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.2.3 Unresolved Recast

Unresolved language-related episodes are conversational phenomena where the questions regarding the problematic utterances are evident to the speaker and the listener but are left unresolved after attempting to provide recasts. Table 3.10 shows the example of an unresolved LRE recast from a dyadic grouping.

**Table 3.10: A sample of LRE- Unresolved Recast for Verbatim Transcription**

| | |
|---|---|
| CF | : Because hmm, Chinese has some, Chinese has a word say *xiao shi liao liao, da wei bi jia* |
| | <proverb in Chinese: being bright at an early age does not necessarily bring success upon growing up> |
| JY | : Okay.. Mm.. like.. maybe.. |
| CF | : *I don't know how to speak in English la* |
| JY | : Haha.. *Never mind, continue..* |
| | (*Unresolved Recast*) |

*Note*. Both L2 learners, JY and CF were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.2.4 No Recast

No recast is a phenomenon when there is no self- or other- repair towards the questions discussed regarding the problematic utterances. This phenomenon occurs might due to the fact that the interlocutors do not notice the immediate need to provide recast or deem it not important to provide recast. Tables 3.11 and 3.12 show the phenomenon of no recast from a dyadic grouping.

**Table 3.11: A sample of No Recast for Verbatim Transcription**

| | |
|---|---|
| YJ | : No need to bring homework? Mobile phone eh, not the what.. |
| J | : No need to bring but still need to try in class then you can store in your phone la..hahaha anything |
| YJ | : What.. ? maybe need la, maybe if you didn't need bring, you can …so, *how to say*? |
| J | : *Yea* |
| | (*No recast is given to assist YJ who seeked help by uttering how to say*) |
| YJ | : Ah…like the replacement of notes la |

*Note.* Both L2 learners, YJ and J were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 3:12: A sample of No Recast for Verbatim Transcription**

| | |
|---|---|
| F | : But then the overall, overall performance will be will be… *<the use of hands gestures to look for a word>* use to it, get used to it, afterwards…. (*Seemed to seek help from his peer to provide the vocabulary he is looking for*) |
| JX | : *Yea..* (*No recast*) |

*Note.* Both L2 learners, F and JX were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.3 Uptakes of Recast

Uptake, according to Lyster and Ranta (1997, p. 49) is defined as "a student's utterance that immediately follows the teacher's feedback and that constitutes a reaction in some way to the teacher's intention to draw attention to some aspect of the student's initial

utterance." A reformulated utterance from the learner gives some reason to believe that the mismatch between learner utterance and target utterance has been noticed, a step at least toward acquisition (Lightbrown, 1998).

### 3.10.2.3.1 Modified Uptake

Modified uptake is the amended utterance that immediately follows the repairs made by their peers. Table 3.13 shows the example of a modified uptake of recast from a dyadic grouping.

**Table 3.13: A sample of Modified Uptake for Verbatim Transcription**

| | |
|---|---|
| A | Faster catch up with the other |
| B | *Shen zhe* (promotion, in Chinese mandarin) <br> (*LREs- seeking help in Chinese mandarin*) |
| A | Oh, ah….*promotion*? <br> (*Recast- Correctly Resolved*) |
| B | Yea, *higher chance to get promotion*. That's why attitude is more important <br> (*Modified uptake of recast: (lexical expanded to morphosyntax*) |
| A | I agree, I agree. That should be different causes la |

*Note.* Both L2 learners, A and B were discussing a simple task entitled "Having good grades does not determine success in life" as shown in  Appendix J3i.

### 3.10.2.3.2 Unmodified Uptake

Unmodified uptake is the exact same utterance that immediately follows the repairs made by their peers. Table 3.14 shows the example of an unmodified uptake of recast from a dyadic grouping.

**Table 3.14: A sample of Unmodified Uptake for Verbatim Transcription**

| | |
|---|---|
| F | : So, What causes |
| JX | : What causes, I think what causes ar, I would like to say… *good grades doesn't represent good life..* |

Table 3.14 continued.

| | |
|---|---|
| F | : *Good grades doesn't represent good life…* |
| | (*Unmodified uptake of recast*) |

*Note.* Both L2 learners, JX and F were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.3.3 Acknowledgment

Acknowledgment is not considered as uptakes of recast, but it is a conversational phenomenon where a learner acknowledges his or her peer's recast for his or her response. Table 3.15 shows the example of an acknowledgment of recast from a dyadic grouping.

**Table 3.15: A sample of Acknowledgment for Verbatim Transcription**

| | |
|---|---|
| A | : Good grades is like.. What do you interpret as good grades? |
| B | : It's like about good results.. |
| A | : *Okay…* |
| | (*Acknowledgment*) |

*Note.* Both L2 learners, A and B were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

### 3.10.2.3.4 No Uptake

No uptake is a conversational phenomenon when a learner does not take up any of the immediate repairs provided in his or her peer's recast. Table 3.16 shows the example of an acknowledgment of recast from a dyadic grouping.

**Table 3.16: A sample of No Uptake for Verbatim Transcription**

| | |
|---|---|
| F | : There are more stuff…is that stubborn? |
| JX | : Is like.. |
| F | : Slow process? Stubborn is "gu zhi" <in Chinese Mandarin, it means stubborn> ar? |
| JX | : Yea, stubborn is gu zhi… less responsive? |

Table 3.16 continued.

| | |
|---|---|
| F | : Oh…? \<rising intonation\> |
| | (*No uptake*) |
| JX | : Less responsive can be like, less responsive can bring to the second point. If they use a lot of time to like Facebooking, they will like less responsive to like… |
| F | : Class… |
| | (*No uptake*) |

*Note:* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

## 3.12 Statistical Procedures

To measure the statistical effects of the independent variable and moderator variable on the L2 individual writing and peer interaction, a two-way repeated measure ANOVA and a paired samples T-test were adopted in this study. Firstly, *descriptive statistics* were used to identify the strength of the association between the variables. Later, inferential statistics were used to identify the probability, if any association from the findings is likely to be due to chance factor.

This study set the level of statistical significance at alpha $p \leq .10$ even though the scientific community has agreed to use $p < .05$ as a rule of thumb for most purposes and being 95 percent confident of results was the accepted standard for explaining the social world (Neuman, 2006). As Kline (2004), Larson-Hall (2015) and Murphy and Myors (2004) have argued that the alpha level should be set to alpha, $p = .10$ in the social science. Researchers and methodologists also suggest that applied linguistic research quantitative studies to set 10% for the statistical significance level in order to avoid Type II error (Kline, 2004; Larson-Hall, 2015; Murphy & Myors, 2004; Nikitina and Furuoka, 2018; Rasinger 2013).

Larsen-Hall (2015) asserts that an increase in the confidence interval from $p < .05$ to $p < .10$ would decrease a probability of generating Type II error by approximately 20 percent. The substantial claim made pertaining to the second language research by Larson-Hall (2016, p.102), "Quote me, and quote also Kline (2004) and Murphy and Myors (2004), who have argued that the alpha level should be set to $\alpha = .10$ in the social science" gives confidence to the researcher of this strand to employ alpha level set at .10. With all these convincing claims and methodological considerations, this study considers and reports the findings in which the $p$ value is less than or equal to the alpha level $p \leq .10$ as significant.

### 3.13 Limitations and Controls of the Study

An experimental design was adopted in this study to enhance its internal validity at the expense of external validity. The result might not be able to generalize to the actual classroom population. To minimize the effect of the experimental setting, the researcher built rapport and trust with the participants before the actual experiments took place to mitigate the artificial moments.

As for the research design, this study adopted a repeated measures design, in which the same partcipants took part in every condition of the research, individual, dyadic and triadic sessions, in order to understand the microchanges of the within subjects. A repeated measures design has more statistical power in controlling factors that cause variability subjects, though this might have caused participants to experience carryover or order effects such as fatigue, boredom, over-familiarity or practice. To minimize any of the aforementioned effects, each session of data collection had a 2-week interval.

This study should have counter-balanced the task condition of this study in order to deal with order effects of the task condition, since a repeated measures design has been

adopted. Counter-balancing is an important procedure that allows a research to control the effects of nuisance variables in the research design, where the same participants were repeatedly subjected to conditions and treatments. However, since the main objectives of this study are to examine the effects of task complexity and task condition on L2 individual writing and peer interaction, the meticulous findings stemmed from the spoken and written productions under each task mechanism should suffice to address the original objectives of the study.

The frequency of each related interactional utterance was coded only once under one feature, e.g. NoM, LREs and Uptakes of recast. This might have caused a loss of quantifying the occurrences of interaction that are possibly for more than one interactional move as well. To overcome this, the inter-coders were told to examine any ambiguous utterance, which might have led to more than one possible label for interactional features. Then, the inter-coders and the researcher would listen back to the audio/video-recording and agree on the most appropriate interactional feature to code the peer interaction.

**3.14 Summary**

This chapter has covered introduction, research design, population and samples. Data collection procedures, instruments, validity test, pilot study, reliability test and data analysis procedures were presented. It also has presented the measures for the qualitative data for the L2 individual writing, in terms of CAF as well as for the peer interaction, in terms of NoM, LREs and Uptakes of recast. The qualitative data of the written measures and the spoken interactional measures were then quantified with quantitative methods. The presentations on the qualitative and quantitative data analysis, results and inferences of the qualitative and quantitative methods are covered in Chapters 4 and 5.

**CHAPTER 4: RESULTS**

## 4.1 Introduction

This chapter reports the findings obtained from the qualitative and quantitative data about the L2 written production, in terms of the global linguistic measures, Complexity, Accuracy and Fluency (CAF) and peer interaction, in terms of Negotiation for Meaning (NoM), Language-related Episodes (LREs) and Uptakes of Recast. As already indicated in the preceding chapter, to validate the hypotheses put forth by the Cognition Hypothesis, both written and spoken data were then analysed qualitatively followed by a quantitative manner, in order to answer two major research questions set in this study.

The primary aim of this study is to investigate the effects of 2 levels of task complexity, simple and complex, operationalized with ± *causal reasoning demands* in 3 task conditions, operationalized with ±*the number of participants*, *individual*, *dyadic* and *triadic* on L2 individual writing. The individual written simple and complex writings were collected from each of the three task conditions, *individual*, *dyadic* and *triadic* and then coded for its global linguistics measures, in terms of lexical and syntactic *Complexities*, grammatical *Accuracy* and *Fluency* (CAF). As mentioned in Chapter 2, CAF are multifaceted and multidimensional constructs, therefore, each linguistic component is measured and analysed with sub-components. To analyze the dependent variables, CAF, the global linguistics measures (Ellis, 2003b; Foster & Skehan, 1996; Larsen-Freeman, 2006) were adopted to code the L2 individual simple and complex writing tasks.

Apart from the written data, this study also looked into the effects of 2 levels of task complexity, simple and complex, operationalized with ± *causal reasoning demands* in 2 task

conditions, operationalized with ±*the number of participants,* dyad and triad on peer interaction. Peer interaction data from the dyadic and triadic task conditions were audio/ video-recorded, transcribed and coded for its interactional features, in terms of NoM, LREs and uptakes of recast. To analyze the dependent variables, NoM, interactionist hypothesis of negotiation of meaning (Long, 1985), LREs (Swain & Lapkin, 1998 & Kormos, 1999) and uptakes of recast (Robinson, 2010) were used to code the peer interactions, in the dyadic and triadic conditions.

The global linguistic qualities, CAF in the L2 were utilized as a measure to evaluate the effects of task complexity on L2 writing in three different task conditions: individual, dyadic and triadic groupings. According to the Cognitive Hypothesis, when a task complexity is increased, learners would produce greater lexical and syntactic complexities as well as accuracy. The proficiency model, CAF was used to evaluate the ability of L2 learners in producing the varied range of sophisticated structures and vocabulary as well as the ability to produce target-like and error-free language. In addition, the Cognitive Hypothesis also hypothesizes that a more complex task tends to heighten learners' interaction (Robinson, 2001, 2003, 2005, 2007). As for the interactional features like NoM, LREs and Uptakes of recast investigated in this study are expressions showing interest to maintain on a topic, asking for clarification or explaining via conversation.

According to Long's (1985) Interactionist Hypothesis, second-language acquisition states that the development of language proficiency is promoted by face-to-face interaction and communication. Swain and Lapkin (1998) view language-related episodes as both a means of communication and a cognitive tool that facilitate language learning, especially when learners talk about the language they are producing, question their language use, or correct themselves or others.

The following sections of this chapter comprise the codings, analyses, presentations and interpretations of the findings in figures and tables. The analyses of data were carried out in two main parts. Firstly, the results of the L2 individual writings, were qualitatively analysed based on three global linguistics measures, Complexity, Accuracy and Fluency followed by the quantitative analyses. Secondly, the results of the peer interactions were analysed qualitatively based on the interactional features, NoM, LREs and Uptakes followed by the quantitative examinations. Data obtained from the L2 individual writings and the dyadic and triadic peer interactions were to answer the following research questions:

1. Is there a statistically significant effect of task complexity (simple vs complex task) and task condition (individual vs dyadic vs triadic grouping) on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency (CAF)* in L2 individual writing?

2. Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning (NoM), Language-Related Episodes (LREs) and Uptake on two task conditions (dyadic vs triadic grouping)?

Data screening was conducted prior to the further statistical analysis for the findings of L2 individual writing (see Appendices L to N for further details) and peer interaction (see Appendices S to V for futher details). For the results of the L2 individual writing, the Greenhouse–Geisser correction was used to report all the main effects of and interactions between the variables. This is due to some assumptions for an RM-ANOVA test were met whereas some were slightly deviated away from the normality (see Appendix N for further details). Although repeated measures ANOVA tests are robust to violation of normality, as Larson-Hall (2010) noted, if the assumptions for an RM-ANOVA test are not met, "deviations away from normality and homoscedasticity are likely to result in a loss of power to find statistical results". Thus, the use of Greenhouse-Geisser correction is able to adjust

the degrees of freedom of the F-distribution in order to elicit a more accurate significance value to compensate the violation of sphericity.

A number of applied linguistics research has gradually recognized the importance of robust statistical methods as some pioneers from this strand like Larson-Hall and Herrington (2010) and Larson-Hall (2012) credibly proved that robust statistical tests are more powerful and accurate than parametric tests. The power and accuracy of the robust statistical tests could be stronger and precise than parametric tests even when data are not normally distributed and sample size is small (for further details, see Kline, 2004; Larson-Hall, 2016; 2010; 2012; Murphy, 2004; Nikitina et al., 2019 and Rasinger, 2013).

As mentioned in Chapter 3, employing robust statistical methods in the applied linguistics research and increasing the alpha level to $p \leq$ .10 have been gradually adopted and recognized by many applied linguistics and second language scholars and researchers (Larson-Hall, 2016; Kline, 2004; Murphy & Myors, 2004). Thus, this study reported the statistically significant findings that are less than or equal to the alpha level, with p-value $p \leq$ .10.

## 4.2 L2 Individual Writing

To examine to what extent task complexity and task condition affected the L2 individual writing, qualitative and quantitative data was analysed to answer the following research question:

Research Question 1:

Is there a statistically significant effect of task complexity (simple vs complex task) and task condition (individual vs dyadic vs triadic grouping) on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency* in L2 individual writing?

### 4.2.1 Qualitative Data (L2 Individual Writing)

The following sections present some extracted examples in terms of lexical and syntactic complexities, grammatical accuracy and fluency. The L2 individual writing was obtained from the L2 learners' performance on simple and complex tasks of three sessions: individual (individual writing without discussion), dyad and triad (individual writing after dyadic and triadic peer discussions).

#### 4.2.1.1 Lexical and Syntactic Complexities

As explained in the previous chapter, the dimensions of MSTTR-50, MLC, DCC and CPT were used to measure lexical and syntactic complexities of the L2 individual writing. To ensure the reliability of the L2 writing measures, this study adopted the Web-based Lexical and Syntactic Complexity Analysers (Ai & Lu, 2010; Lu 2010) to consistently measure the lexical and syntactic complexities of L2 individual written texts. A sample with a total of six argumentative L2 individual written texts that were derived from a participant is shown in Appendix K along with the generation of the relevant indices for the measures of lexical and syntactic complexities.

#### 4.2.1.2 Accuracy (Error-free clauses)

As for the measure of L2 individual written accuracy, the dimension of Error-free Clauses (EFC) was adopted due to the commonly adopted measure in the existing literature. The error-free clauses were measured with the following formula:

*Error-free clauses /Total of clauses*

The following written text is a sample of L2 individual writing extracted from the simple task of an individual session, entitled "Parental pressure often does more harm than good". In total, there are 33 clauses produced in this written text.

In this advance technology era, /things get more complicated/ (+) and /competition between people occurs/ (+). /The best example is the pressure given to the new generation/ (+). /This problem cannot be ignored and must be treated seriously/ (+).

+ 4//, Total: 4//

/Parents always want their children to be the best/ (+) as /they have high hope on their children/ (+). /This is the main reason causing the pressure to the youngsters/ (-). Since /the education system is improving/ (+) and /some of the parents do not have the opportunity to study/ (+). /These factors make the parents want their children to do better in their future/ (+) and /this causes the most parental pressure to this problem/ (-).

+ 5//, - 2//, Total: 7 //

/The next cause of the problem is the competition among the kids/ (+). As /we know/ (+), /giving the chance to the youngsters to learn earlier is good but not giving excessive homework or tuition classes to them/ (+). For example, forcing their children to tuition classes even when /they are just four or five years old/ (-). /The childhood is the best period in our entire life/, /we cannot just ruin it by giving them so much pressure/ (-). /Some parents are trying to compete their children with others/ (+) and /this must be avoided/ (+).

+5 //, -2//, Total= 7 //

From the pressure above, /there are some effects would occur/(+). /The first one is the youngsters would get emotional easily, stress and unhappy/ (-). /These are just the beginning and would get worse/ (+) if /do not treated seriously/ (-). If /the kids still unable to find their way out of it/ (-), /some suicidal cases or run away from home cases would happen/ (+).

+3 //, -3 //, Total= 6 //

Moreover, /the parental pressure will also affect the youngsters' future/ (+). /As most of the parents wanted their children to become a doctor, lawyer or some well-paid job/ (-). /This will eventually destroy their dream to get the job/ (-) that /they are interested in/ (+). /They might regret/ (+) after /they grow up and hate their parents by forcing them to reach their expectations/ (-). 6 //

+3 //, -3 //, Total= 6 //

As a conclusion, /education is important to the kids/ (+) but /over amount of homework or classes will cause a lot harmful effects to the new generation/ (-). /Pushing the children to a better future is good but not forcing them/ (-). 3 //

+1 //, -2 //, Total= 3 //

*Note.* // indicates a clause, + indicates error-free, - indicates with error


Grand total: Error-free clauses 21/33= 0.64

### 4.2.1.3 Fluency

Larsen-Freeman (2006) considers fluency as the number of words in the language production, that is, the total length of the text and the total number of words per T-units. A *T-unit* is defined as an independent clause and all its dependent clauses attached or embedded in it (Hunt, 1964). The measure of fluency was measure with total number of words in a written text per total number of T-units of a written text, which is 354/ 26.

### 4.2.1.4 Text Length

The text length of the L2 individual writing was measured with the mean length of all the text length. The total number of words for each of the simple and complex written texts was totaled up respectively. Then, each was divided by the total number of written texts produced in simple and complex tasks respectively.

### 4.2.2 Quantitative Data (L2 Individual Writing)

The following sections present statistical findings obtained from the L2 individual writing of three sessions, individual (without discussion), dyad and triad (after peer discussion) in simple and complex tasks, in terms of lexical and syntactic complexities, grammatical accuracy and fluency.

### 4.2.2.1 Lexical and Syntactic Complexities

In this study, the global linguistic measure of complexity was analysed lexically and syntactically. The lexical complexity was measured using the commonly used dimension, Mean Segmental Type/ Token Ratio-50 (MSTTR-50). As for measures of syntactic

complexity, three commonly adopted dimensions, namely Mean Length of Clause (MLC), Dependent Clause per Clause (DCC), and Coordinate Phrase per T-unit (CPT) (Housen, Kuiken & Vedder, 2012) were adopted.

The overall analysis of the means and standard deviations for each dimension of lexical and syntactic complexities is presented in Table 4.1.

**Table 4.1      Measures of lexical and syntactic complexities**

| | | Individual Grouping | | | | Dyadic Grouping | | | | Triadic Grouping | | | |
| | | Simple (Ind) | | Complex (Ind) | | Simple (Ind) | | Complex (Ind) | | Simple (Ind) | | Complex (Ind) | |
| | *N* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MSTTR-50 | 36 | .76 | .04 | .76 | .04 | .75 | .04 | .77 | .04 | .75 | .04 | .78 | 0.40 |
| MLC | 36 | 9.79 | 1.42 | 9.41 | 1.33 | 10.10 | 1.77 | 10.30 | 1.50 | 9.90 | 1.76 | 10.50 | 1.74 |
| DCC | 36 | .41 | .10 | .45 | .28 | .36 | .094 | .36 | .090 | .43 | .086 | .30 | .09 |
| CPT | 36 | .46 | .20 | .38 | .15 | .38 | .15 | .42 | .16 | .49 | .23 | .43 | .16 |

*Note*. Computed using alpha = .10

### 4.2.2.1.1 Lexical Complexity: Mean Segmental Type/Token Ratio-50 (MSTTR-50)

A repeated measures ANOVA test was conducted to evaluate if there is any change in participants' L2 individual written production of simple and complex tasks, in terms of lexical complexity MSTTR-50, in individual, dyadic and triadic conditions.

The results of the repeated measures ANOVA test with a Greenhouse-Geisser correction (see Table O1 in Appendix O) indicated there is a statistically significant effect of task complexity on lexical complexity, MSTTR-50, $F(1,35)=3.168$, $p =.084$, $\eta^2 = .083$. Follow up post hoc test for task complexity using Bonferroni correction (see Tables Q1a and R1a in Appendices Q and R) indicates that each pairwise difference between simple (*M*= .757) and complex (*M*=.763) tasks is significant, *p*= .084.

There is a statistically significant task condition effect on lexical complexity, a Greenhouse-Geisser correction (see Table O1 in Appendix O), $F(2,70)=5.377$, $p = .007$, $\eta^2 = .133$. Follow up post hoc test using Bonferroni correction (see Tables Q1h and R1h in Appendices Q and R) indicates that each pairwise difference between dyad ($M=.752$) and triad ($M=.768$) is significant, $p= .005$.

There is a statistically significant increase of lexical complexity when the number of participants increased from dyad to triad. This suggested that triadic grouping increased L2 learners' lexical complexity, MSTTR-50, in the individual argumentative writing. The means of the overall interaction between task complexity and task condition is also statistically significant, with a Greenhouse-Geisser correction (see Table O1 in Appendix O), $F(2,70)= 8.552$, $p= .000$, $\eta^2 = .196$.

### 4.2.2.1.2 Syntactic Complexity: Mean Length of Clause (MLC)

A repeated measures ANOVA test was conducted to evaluate if there is any change in participants' L2 individual written production of simple and complex tasks, in terms of syntactic complexity, mean length of clause, in individual, dyadic and triadic conditions.

The results of the repeated measures ANOVA test with a Greenhouse-Geisser correction (see Table O2 in Appendix O) indicates there is a statistically significant effect of task complexity on syntactic complexity, in terms of mean length of clause (MLC), $F(1,35)=5.966$, $p =.020$, $\eta^2 = .146$. Follow up post hoc test for task complexity using Bonferroni correction (see Tables Q2a and R2a in Appendices Q and R) indicates that each pairwise difference between simple ($M=9.766$) and complex ($M=10.230$) tasks is significant, $p= .020$.

There is also a significant difference of task condition effect on syntactic complexity, MLC, a Greenhouse-Geisser correction (see Table O2 in Appendix O), $F(2,70)=4.782$, $p = .011$, $\eta^2 = .120$. Follow up post hoc test for task condition using Bonferroni correction (see Tables Q2h and R2h in Appendices Q and R) indicates that each pairwise difference between dyad ($M=9.652$) and triad ($M=10.299$) is significant, $p= .028$.

There is a significant increase in the syntactic complexity when increasing task complexity along with the number of participants from dyad to triad. This finding suggests that triadic grouping increased L2 learners' syntactic complexity, in terms of MLC, in the individual argumentative writing. However, the means of the overall interaction between task complexity and task condition is not statistically significant, a Greenhouse-Geisser correction (see Table O2 in Appendix O), $F(2,70)= .041$, $p = .960$.

### 4.2.2.1.3 Syntactic Complexity: Dependent Clause per Clause (DCC)

A repeated measures ANOVA test was conducted to evaluate if there is any change in participants' L2 individual written production of simple and complex tasks, in terms of syntactic complexity, dependent clause per clause (DCC), in individual, dyadic and triadic conditions.

The results of the repeated measures ANOVA Mauchly's test of sphericity (as shown in Table N3 in Appendix N) indicates that the assumption of sphericity for task condition, $\chi 2(2)=22.840$, $p= .000$ and between task condition and task complexity, $\chi 2(2)=20.808$, $p= .000$ had been violated. A repeated measures ANOVA test with a Greenhouse-Geisser correction (see Table O3 in Appendix O) shows that there is a statistically significance of

task complexity effect on the mean syntactic complexity, DCC, $F(1,35)=5.690$, $p=.023$, $\eta^2 = .140$. Follow up post hoc test using Bonferroni correction (see Tables Q3a and R3a in Appendices Q and R) indicates that each pairwise difference between simple ($M= .405$) and complex ($M= .364$) tasks is statistically significant, $p= .023$.

There is also a statistically significant difference of task condition effect on syntactic complexity, with a Greenhouse-Geisser correction (see Table O3 in Appendix O), $F(2,70)=11.567$, $p = .000$, $\eta^2 = .248$. Follow up post hoc test using Bonferroni correction (see Tables Q3h and R3h in Appendices Q and R) indicated that each pairwise difference between dyad ($M= .439$) and triad ($M= .330$) is statistically significant, $p= .001$ as well as between triad ($M= .330$) and individual ($M= .385$) which is also significant, $p= .000$.

There is a statistically significant decrease in the syntactic complexity when increasing task complexity along with the number of participants from dyad to triad. This suggests that triadic grouping decreased L2 learners' syntactic complexity in the individual argumentative writing. However, the means of the overall interaction between task complexity and task condition is not statistically significant, with a Greenhouse-Geisser correction (see Table O3 in Appendix O), $F(2,70)= .640$, $p = .475$, $\eta^2 = .018$.

### 4.2.2.1.4 Syntactic Complexity: Coordinate Phrase per T-unit (CPT)

A repeated measures ANOVA test was conducted to evaluate if there was any change in participants' L2 individual written production of simple and complex tasks, in terms of syntactic complexity, coordinate phrase per T-unit, in individual, dyadic and triadic conditions.

The results of the repeated measures ANOVA test with a Greenhouse-Geisser correction (see Table O4 in Appendix O) indicates that there was a statistically significant task complexity effect on syntactic complexity, in terms of coordinate phrase per T-unit (CPT), $F(1,35)=3.083$, $p = .088$, $\eta^2 = .081$. Follow up post hoc test for task complexity using Bonferroni correction (see Tables Q4a and O4a in Appendix Q and R) indicates that each pairwise difference between simple ($M= .406$) and complex ($M= .444$) tasks is statistically significant, $p= .088$. However, there is no statistically significant difference of task condition effect on syntactic complexity, with a Greenhouse-Geisser correction (see Table O4 in Appendix O), $F(2,70)=1.163$, $p = .318$, $\eta^2 = .032$. However, the means of the overall interaction with a Greenhouse-Geisser correction between task complexity and task condition is statistically significant, $F(2,70)= 4.223$, $p= .019$, $\eta^2 = .723$.

#### 4.2.2.2 Accuracy

The global linguistics measure, grammatical accuracy was measured using error-free clauses. A repeated measures ANOVA was conducted to evaluate if there is any change in the L2 individual written production of simple and complex tasks, in terms of accuracy, error-free clauses, in individual, dyadic and triadic conditions as shown in Table 4.2.

**Table 4.2     Measure of Accuracy**

|  |  | Individual Grouping | | | | Dyadic Grouping | | | | Triadic Grouping | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Simple (Ind) | | Complex (Ind) | | Simple (Ind) | | Complex (Ind) | | Simple (Ind) | | Complex (Ind) | |
|  | N | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| EFC | 36 | .28 | .17 | .28 | .12 | .26 | .14 | .30 | .16 | .28 | .14 | .35 | .13 |

*Note*. Computed using alpha = .10

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#### 4.2.2.2.1 Grammatical Accuracy: Error-free clauses

The results of the repeated measures ANOVA test with a Greenhouse-Geisser correction (see Table O5 in Appendix O) indicated that there is a statistically significant task complexity effect on accuracy, error-free clauses (EFC), $F(1,35)=4.979$, $p =.032$, $\eta^2 = .125$. Follow up post hoc test using Bonferroni correction (see Tables Q5a and R5a in Appendices Q and R) indicates that each pairwise difference between simple ($M= .275$) and complex ($M= .307$) tasks is significant, $p= .032$. As for the effect of task condition on accuracy, the result with a Greenhouse-Geisser correction (see Table O5 in Appendix O) reveals that there is no statistically significant difference of task condition effect on accuracy, $F(2,70)=1.633$, $p= .205$, $\eta^2= .045$. However, the means of the overall interaction between task complexity and task condition is statistically significant, with a Greenhouse-Geisser correction (see Table O5 in Appendix O), $F(2,70)= 3.426$, $p= .041$, $\eta^2= .089$.

#### 4.2.2.3 Fluency

The global linguistic measure, fluency was measured using total of words per T-units. A repeated measures ANOVA test was conducted to evaluate if there is any change in participants' L2 individual written production of simple and complex tasks, in terms of fluency, words per T-unit and text lengths, in individual, dyadic and triadic conditions as shown in Table 4.3.

**Table 4.3     Measures of fluency**

| | | Individual Grouping | | | | Dyadic Grouping | | | | Triadic Grouping | | | |
| | | Simple (Ind) | | Complex (Ind) | | Simple (Ind) | | Complex (Ind) | | Simple (Ind) | | Complex (Ind) | |
| | N | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| Words/ T-units | 36 | 17.79 | 3.07 | 16.40 | 2.93 | 16.96 | 3.17 | 17.07 | 2.80 | 18.14 | 3.07 | 15.20 | 3.15 |
| Text Length | 36 | 333.42 | 90.73 | 328.0 | 98.0 | 300.33 | 89.0 | 386.5 | 99.8 | 301.64 | 74.70 | 379.70 | 108.70 |

*Note*. Computed using alpha = .10

#### 4.2.2.3.1 Fluency: Words/ T-units

The results of the repeated measure ANOVA test with a Greenhouse-Geisser correction (see Table O6 in Appendix O) indicates there is no statistically significant task complexity effect on fluency, $F(1,35)= .628, p =.433, \eta^2 = .018$.

However, there is a statistically significant difference of task condition effect on fluency, with a Greenhouse-Geisser correction (see Table O6 in Appendix O), $F(2,70)=11.253, p = .000, \eta^2 = .243$. Follow up post hoc test using Bonferroni correction (see Table Q6h and R6h in Appendices Q and R) indicates that each pairwise difference between dyad (*M*=17.248) and triad (*M*=16.079) is statistically significant, *p*= .003. The individual (*M*=17.428) and triad (*M*=16.079) is also statistically significant, *p*= .000.

There is a statistically significant increase in the syntactic complexity when increasing task complexity along with the number of participants from dyad to triad. This suggests that triadic grouping increased the L2 learners' words per T-unit in the individual argumentative writing. The means of the overall interaction with a Greenhouse-Geisser correction (see Table O6 in Appendix O) between task complexity and task condition is statistically significant, $F(2,70)= 9.531, p= .000, \eta^2= . 214$.

### 4.2.2.3.2 Text Length

In addition to the global linguistic measures, CAF, the text lengths of the simple and complex tasks were measured with the total number of words. A repeated measures ANOVA test was conducted to evaluate if there was any change in participants' L2 individual written production of simple and complex tasks, in terms of text length, in individual, dyadic and triadic conditions.

The results of the repeated measures ANOVA test with a Greenhouse-Geisser correction (see Table O7 in Appendix O) indicates there is statistically significant task complexity effect on text length, $F(1,35)= 19.331$, $p =.000$, $\eta^2 = .356$. Follow up post hoc test using Bonferroni correction (see Table Q7a and R7a in Appendices Q and R) indicates that each pairwise difference between simple ($M$=320.583) and complex ($M$=355.935) is statistically significant, $p$= .000.

There is a statistically significant difference of task condition effect with a Greenhouse-Geisser correction (see Table O7 in Appendix O) on fluency, $F(2,70)$=16691, $p$= .000, $\eta^2 = .323$. Follow up post hoc test using Bonferroni correction (see Table Q7h and R7h in Appendices Q and R) indicates that each pairwise difference between individual ($M$=359.958) and dyad ($M$=314.819) is statistically significant, $p$= .000 and dyad ($M$=314.819) and triad ($M$=340) is statistically significant, $p$= .008.

There is a statistically significant increase in the text length when increasing task complexity along with the number of participants from dyad to triad. This suggests that triadic grouping increased L2 learners' syntactic complexity in the individual argumentative writing. The means of the overall interaction between task complexity and task condition is

statistically significant, with a Greenhouse-Geisser correction (see Table O7 in Appendix O),
$F(2,70)= 12.423$, $p= .000$, $\eta^2= .262$.

## 4.3 Peer Interaction

To examine to what extent task complexity and task condition affected the dyadic and triadic peer interactions, in terms of NoM, LREs, and Uptakes of recast, the following research question was set to guide the second part of this research study:

Research question 2:

Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning, Language Related Episodes and Uptake on two task conditions (dyadic vs triadic grouping)?

### 4.3.1 Qualitative Data (Peer Interaction)

The following sections illustrate extracted examples from dyadic and triadic peer interaction in simple and complex tasks, in terms of negotiation of meaning and its associated interactional features, language-related episodes that focused on recast made by peers as well as uptakes of recast.

#### 4.3.1.1 Negotiation of Meaning

This study examined the effects of task complexity and task condition on peer interaction, in terms of negotiation of meaning and its associated interactional features, such as clarification requests, confirmation checks and comprehension checks. Negotiation of meaning is a communication process in which learners, who acted as listeners and speakers,

carry on with their interaction in order to reach a clear understanding. During the peer interaction, the learners asked for clarification, checked others' comprehension, and confirmed what other have said. These are all strategies for the negotiation of meaning that are presented in the following sessions.

### 4.3.1.1.1 Clarification Request

A learner listened to the speaker with no degree of understanding, followed by any expression, which elicited clarification of the preceding utterance to ensure the right understanding, in *wh-* or *yes-no* questions or in statement forms, for example, *pardon? I beg your pardon? What did you mean?*

The italicised examples of clarification request as shown in Tables 4.4 and 4.7 are extracted from the dyadic and triadic discussions of simple and complex tasks.

**Table 4.4: A sample of Clarification Request extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| J | : I think the cane will be their friend |
| YJ | : *The what?* |
| | (*Clarification request*) |
| J | : Canning <hand gestures of canning> |
| YJ | : *What did you mean '*k*'?* |
| | (*Clarification request*) |
| J | : Cane  <wrote the word on the paper> "tengbian" <in Chinese mandarin, cane> |
| YJ | : Oh! I thought that is "ganzhe" in Chinese mandarine sugar cane [hahaha] |

*Note.* Both L2 learners, J and YJ were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

**Table 4.5: A sample of Clarification Request extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| YH | : I heard from my friend that sometimes they use phone to record the lecturer teaching so that they can refresh themselves after class.. |
| TY | : Also, okay, agree.. write that down lo, uh.. record down…*what, lecturer*? *Those e-class*? (*Clarification request*) |

*Note.* Both L2 learners, YH and TY were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.6: A sample of Clarification Request extracted from a Simple Triadic Discussion**

| | |
|---|---|
| HR | : All right, so okay, maybe we can still discuss right, what do you think is the border line for your freedom? |
| ZS | : *Border line?* (*Clarification request*) |
| HR | : Yea, I mean like in Asian culture, I think most parents, they force their children to do certain course right? |
| XY | : Mm.. |

*Note.* Three L2 learners, HR, ZS and XY were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.7: A sample of Clarification Request extracted from a Complex Triadic Discussion**

| | |
|---|---|
| XY | : Now going to stage four, then eventually, she have to use like something more strong for it |
| HR | : Oh.. *what…? what cancer does she have?* (*Clarification request*) |
| XY | : I don't... I'm not sure.. |
| HR | : Oh..oh, okay.. but, I don't know la.. like if you really choose a doctor to tell you something… |
| ZS | *: Huh?* (*Clarification request*) |
| HR | : If you have cancer, then doctor talks to you, would you rather him tell you, you're dead 100%, or would you rather him remind you, you have a chance to live but you have to go through this procedure.. which one will you choose? |

*Note.* Three L2 learners, HR, XY and ZS were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

As for the interactional feature, confirmation check, a learner listened to a speaker's preceding utterance with some degree of understanding but he or she was not fully understood. The listener learner repeated the speaker's preceding utterance to check if his/ her understanding of the speaker's previous utterance was correct.

Confirmation check is any expression immediately followed the preceding utterance, which intended to confirm that the utterance was understood or heard correctly through repetition with rising intonation. The following is extracted from part of the triadic conversation. The italicised examples of confirmation check as shown in Tables 4.8, 4.9, 4.10 and 4.11 are extracted from the dyadic and triadic discussions of simple and complex tasks.

**Table 4.8: A Sample of Confirmation Check extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| CK | : What are…this is the cause of having good grades does not success, so the cause is attitude determines altitude. So the effect of it should be, arr, attitude determines our future, as, it's more important to learn how to deal with people instead of working for the.. |
| BH | {Eye contact indicating the agreement with CK} |
| CK | : *Is that right? Disagree* la..? (*Confirmation Check*) |
| BH | : Absolutely right |
| CK | : [Attitude] is more… |
| BH | : [right…] hahaha… stop being pretentious.. |
| CK | : [Hahaha]… prominent… |

*Note.* Both L2 learners, BH, and CK were discussing a simple task entitled "Having good grades does not determine success in life" as shown in  Appendix J3i.

**Table 4.9: A Sample of Confirmation Check extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| F | : It will disrupt, disrupt during the classes la |
| JX | : *Disrupt yea..?* |
| | (*confirmation check*) |
| F | : They receive any messages, it will disrupt [the entire process..] |

*Note.* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.10: A Sample of Confirmation Check extracted from a Simple Triadic Discussion**

| | |
|---|---|
| XY | : Like…not like…strict strictly restrict them la [cannot play game] |
| ZS | : [cannot play game] |
| XY | : Just like given them ah..like a period of time, you only can play, like two to three hour, or one two hours then.. |
| HR | : So, so you teach them discipline la *right*? |
| | (*Confirmation check*) |
| XY | : Yea.. |

*Note.* Three L2 learners, HR, ZS and XY were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.11: A Sample of Confirmation Check extracted from a Complex Triadic Discussion**

| | |
|---|---|
| ZS | : All right, let's say phones… you know there's… you know, you know, you know, there's a someone said before right, the phones get smarter, the people get more.. more and more stupid right? Technological uh..something like this la.. I forgot the exact because people are too relying on technology like..uh….let's say la…hmm.. what ar, oh yea… back then I was like in…what do you call.. primary school, yea primary school, when I was doing Chinese right, my Chinese is really bad, so.. so there are a lot of words I don't know how to pronounce la, so I had to look it up in this dictionary, the kind of bulky dictionary, yea.. I have to look up every single word, there is a chunk of… I kind of learn uhh how to write the word, how to pronounce the word even bet.. even better. |
| XY | : Oh.. |
| HR | : *So, you are saying that* it does more good than harm *is it*? |
| | (*Confirmation check*) |
| ZS | : Technology does more harm than good. |
| HR | : Oh… okay.. |

*Note.* Three L2 learners, HR, XY and ZS were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

### 4.3.1.1.3 Comprehension Check

With regard to the interactional feature, comprehension check, a learner asked another learner listener if he or she has understood his/her preceding utterances. Comprehension check can be any expression established to ensure if the learner speaker's own preceding utterance has been understood by the addressee. The following Tables from 4.12 to 4.15 are some examples of comprehension check extracted from a part of dyadic and triadic conversations.

**Table 4.12: A Sample of Comprehension Check extracted from a Simple Dyadic Discussion**

| |
|---|
| L : In a way technology also like like not letting the things to happen by its own, like what's meant to be.. maybe like the people who met in tinder, it's just not what it's meant to be, like not the technology is not invented, it could also, I mean, they could not have been together and someone who is actually meant to be but killing their lives, and *you know what I mean?* (*Comprehension check*) |
| R : Yea… |

*Note.* Both L2 learners, L, and R were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

**Table 4.13: A Sample of Comprehension Check extracted from a Complex Dyadic Discussion**

| |
|---|
| ZS : I am..this kind baseball I mean.. i..uh it lasts for 30 minutes to.. an hour.. more than an hour, basically, Mm.. for me la, playing one game, is unsatisfactory la.. if I use that, if you telling me, only play like two hours, I lose that game right, and then time's up, I can't play anymore, I will I will leave [my desk and flip].. reallydisap..really disappointed feeling, cant even have a sense of glory or something.. |
| HR [leave Computer room.. break the bell.. ] |
| ZS : you you. *.do you get my point?* (*Comprehension check*) |
| HR : Yea, got it.. depressed first la |
| ZS : Yea… glory...! |

*Note.* Both L2 learners, ZS and HR were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.14: A Sample of Comprehension Check extracted from a Simple Triadic Discussion**

| | |
|---|---|
| YJ | :Uh, okay, and then, uh.. *"may...maychure..maychure"..?* |
| | (*Comprehension check*) |
| | <mispronunciation a word, mature, repeating the word with rising intonation to check with her peer if she understands the word she mentioned) |
| J | :Mature ah? |
| | Other corrected and also confirmation check |
| YJA | :Oh.. ! |

*Note.* Three L2 learners, YJ, J and YJA were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.15: A Sample of Comprehension Check extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CW | : Improve in life quality is like you can now you can have a heater for your bath, you can bath with hot water. Instead of cold water, and these all will improve our living quality. Then, save time is like maybe calculate… *you get it*? |
| | (*Comprehension check*) |
| F | : I don't need to heat the water to bathe [hahaha] |
| CY | : [hahaha] Yea.. |

*Note.* Three L2 learners, CW, F and CY were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

### 4.3.1.2 Language-Related Episodes: Recast

Language-related Episodes (LREs) is defined by Swain and Lapkin (1998) as "any part of dialogue where the students talk about the language they are producing, question their language use, or correct themselves or others" (p.326).

Generally, there are two forms of language-related episodes, namely lexis-based and form-based LREs. With respect to the lexical-based language-related episodes, LREs are analyzed on a lexical-based basis, learners talk about, question or correct the vocabulary they are producing or using. As for the form-based language-related episodes, learners talk about, question or correct the sentence structures they are producing or using.

However, this study only focused on the LREs lexis-based recast as the findings of this study showed that the lexis-based LREs were more evidently produced in L2 learners' dyadic and triadic discussions as compared to the form-based LREs. For instance, in Table 4.16, the focus on lexical-based LREs is evident when learner BH repeated the similar point made by learner CK earlier, with vocabularies *disturbance* and *distraction*.

Both L2 learners seemed to shift their attention from focusing on meaning to focusing on the use of vocabulary. In this case, the phenomena that indicate that they were discussing the vocabulary they used serves as the occurrence of LREs.

**Table 4.16: A Sample of Language-Related Episodes extracted from a Complex Dyadic Discussion**

| |
|---|
| BH    : It will affect, the effect is it will affect the flow… |
| CK    : Cause *distraction*. Yea I know. |
| BH    : The flow of the regular conduct |
| CK    : Yes, okay…the {pronounced as di} flow, lecturer were conducting the class |
| BH    : Cause *disturbance* to others <br> (*Language-related Episode*) |
| CK    : *Disturbance* ah? *Disturbance* and *distraction* they are the same. The flow of the class <br> (*Language-related Episode*) |

*Note.* Both L2 learners, BH and CK were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i. Their focus was on the use of vocabulary, *distraction* and *disturbance*.

However, in Table 4.17, despite the sentence structures produced by both L2 learners had severely violated grammar rules and in need of some solution to amend the ill-formed sentences they have produced, nothing brought to their attention of form-based LREs. Interestingly, it still did not impede their understanding and information exchange. This could be due to the fact that they are used to the Malaysian English colloquial variety used in their daily life.

**Table 4.17: A Sample of Language-Related Episodes extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| F | : That's why they are not allowed to bring their handphone to the class.. |
| JX | : They feel it's more meaningful to use mobile phone other than listening to the class. |
| F | : Because they are human mar, they will find more meaningful than the ordinary class. So, one more disadvantages, what makes you disagree with this statement? |
| JX | This will, other than this, I also think that using mobile phone will become ah, like a bad behavior for disrespecting the the lecturer. If this carry on, it will bring, it will like, it will like… |
| F | Maybe the connection, the class will be like …lecturer think they will like doesn't respect him or she, so it will like no respect you also. |

*Note.* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

Based on the findings, this study focused more on language-related episodes lexis-based recasts, in terms of *correctly resolved, partially or incorrectly resolved, unresolved* and *no recast*.

### 4.3.1.2.1 Correctly Resolved Recast

The correctly resolved recast is a part of LRE dialogue where the learners successfully resolved the language issues they discussed, produced or questioned. The following Tables 4.18 to 4.21 are examples of language-related episode, in terms of lexical- and form-based correctly resolved interactional features extracted from a part of dyadic and triadic conversations.

**Table 4.18: A Sample of Correctly Resolved Recast extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| F | : Because if, you have a good grades, of course you have a very high kick start, but then like another have a good grade but then he can work very determined, he can have higher possibility to get this …*what is it called?* (*Lexical-based LRE*) |
| JX | : Faster catch up with the others? |
| F | : Shen zhe < in Chinese Mandarin, means promotion> |

Table 4.18 continued.

| | |
|---|---|
| JX | : Oh, ah….*promotion*? |
| | (*LRE:Correctly resolved Recast*) |
| F | : Yea, higher chance to get *promotion*. That's why attitude is more important |

*Note.* Both L2 learners, F, and JX were discussing a simple task entitled "Having good grades does not determine success in life" as shown in  Appendix J3i.

### Table 4.19: A Sample of Correctly Resolved Recast extracted from a Complex Dyadic Discussion

| | |
|---|---|
| JY | : Ni kan dao ren jia you mai le xin de shou ji, ni ye xiang mai <Spoken in Chinese Mandarin, in English, it means "you see someone has a new phone, then you also want to have a new one">. So, … |
| CF | : *Xu rong xin?* <in English, it means "materialistic"> <Spoken in Chinese Mandarin, to check with his peer if that what he tried to mean, NoM in L1 and lexis-based LRE recast in L2>..*materialistic*, *materialistic*.. (*Lexical-based LRE Correctly Resolved Recast*) |
| JY | : Jiu shi you na ge <that's the> materialistic de <possessive of> heart. Ah, jiu shi zhe ge <that's it>. |

*Note.* Both L2 learners, JY and CF were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

### Table 4.20: A Sample of Correctly Resolved Recast extracted from a Simple Triadic Discussion

| | |
|---|---|
| YJ | : Then, I might as well just disagree. |
| QH | : Of course. You don't have, you don't have to.. |
| YJ | : Then, I disagree with this statement. I think if too much freedom is given, the teenagers they might be over. Being naughty la, just like.. uh uh uh *how to say ah*, uh… parents always uh, they they experience life experience, the youth, so, so if if if they uh.. just give much freedom for their child, uh then naughty then maybe in their riding.. I think it's actually, it's actually, *how to say*, it's actually… |
| CC | : They will be *spoilt*? (*Lexical-based LRE Correctly Resolved Recast*) |
| YJ | : Yea yea , the child will be *spoilt!* |

*Note.* Three L2 learners, YJ and QH and CC were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.21: A Sample of Correctly Resolved Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CW | : Production increasing.. |
| F | : Increase ah, increase product shh.. |
| CY | : *Product shit* ah? [Hahaha] |
| F | : *Production line* |
| | (*Lexical-based LRE Correctly Resolved Recast*) |
| CY | : But, how this uh, how this effect saving life? |
| CW | : You can *produce* more food. |

*Note.* Three L2 learners, CW, F and CY were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

### 4.3.1.2.2 Partially/ Incorrectly resolved Recast

Partially or incorrectly resolved LRE recast is a part of dialogue where the learners attempted to solve the language issues they were discussing, producing or questioning, but only partially or unsuccessfully resolved the language issues. The following Tables 4.22, to 4.25 are extracted from a part of dyadic triadic conversations, for example, the word *reduced* is incorrectly resolved in this case.

As shown in Table 4.22, JX was looking for language assistance to describe *radiation*; however, her peer mistakenly resolved the verb with *reduced*, whereas *release*, which was initially correctly used by JX, was ignored. In this case, the LRE was considered as incorrectly resolved.

**Table 4.22: A Sample of Incorrectly Resolved Recast extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| JX | : We need, ar we need mobile phone, the mobile will *release* the… |
| F | : Signal *reduced* by the mobile phone can affect the body. So the first point is it will distracting the class, distract the class , distract ourselves.. |
| | (*Incorrectly resolved Recast*) |
| JX | : Yea… |

*Note.* Both L2 learners, JX and F were discussing a simple task entitled "Having good grades does not determine success in life" as shown in  Appendix J3i.

**Table 4.23: A Sample of Partially/ Incorrectly Resolved Recast extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| KM | : Concentrated during the class, will get better result, this is the first point.. Uh, if we think from the college, first point maybe is easily to communicate with the parents, second is safety, you can always call someone.. eh,…no, cannot, this one is… \<sigh\> |
| JM | : In class.. oh yea, in class, so… |
| KM | : In class, or maybe …. Ah, we will easily to scroll other poems, social media apps, like Facebook, whatsapp, wechat groups, easily to get…causes, easily to get… |
| JM | : *Addicted*? (Incorrectly Resolved Recast, should be *distracted*) |
| KM | : Because it's easily to get, to to…using…causes….uh…easy to use as social media apps, like Facebook, \<slip of tongue in Chinese Mandarin: ran hou: after that…\> the effects.. effect we can say like |
| JM | : *Causes will be losing concentration* (Incorrectly Resolved Recast, should be *distraction*) |

*Note.* Both L2 learners, KM and JM were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.24: A Sample of Partially/ Incorrectly Resolved Recast extracted from a Simple Triadic Discussion**

| | |
|---|---|
| CW | : Teenagers need to be given time to develop themselves, so what's the effect? Become.. |
| F | : *Become bad bad* (*Partially/ Incorrectly resolved recast*) |
| CY | : *Become bad bad* lo.. And then ah..maybe they will get into police station and get something *bad bad*.. |

*Note.* Three L2 learners, CW and F and CY were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.25: A Sample of Partially/ Incorrectly Resolved Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CW | : So I think it allows us to travel further.. so you see, long time ago, they do not have technology, they don't have aircraft, then if you born in Malaysia, you can only stay in Malaysia, maybe you can walk to Thailand, this is *the far.. uh the further* you can get.. (*Incorrectly Resolved Recast- Self-initiated*) |
| CY | : Hmm.. |
| CW | : With technology, now you got aircraft, and sometime you can go Paris or you can go Tokyo.. |
| F | : Travelling lo.. |

*Note.* Three L2 learners, CW, F and CY were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

<center>**4.3.1.2.3 Unresolved Recast**</center>

With respect to the unresolved LRE recast, it is a part of dialogue where learners did not manage to solve the language issues they realize, discuss, produce or question after attempting to provide recast. The following Tables 4.26 to 4.29 are some examples of the unresolved LREs extracted from a part of dyadic and triadic conversations.

<center>**Table 4.26: A Sample of Unresolved Recast extracted from a Simple Dyadic Discussion**</center>

| | |
|---|---|
| CF | : Because hmm, Chinese has some, Chinese has a word say *xiao shi liao liao, da wei bi jia* <br> &lt;proverb in Chinese: being bright at an early age does not necessarily bring success upon growing up&gt; |
| JY | : Okay... Mm.. like… maybe… |
| CF | : *I don't know how to speak in English la* |
| JY | : Haha.. *Never mind, continue..* <br> (*Unresolved Recast*) |

*Note.* Both L2 learners, JY and CF were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

<center>**Table 4.27: A Sample of Unresolved Recast extracted from a Complex Dyadic Discussion**</center>

| | |
|---|---|
| TY | : So, they don't need to bring two calculators la, they can use the calculator inside the phones.. [inside of the].. |
| YH | : One of the feature, [one of the feature] oh.. &lt;rising intonation&gt;.. there are more la.. |
| TY | : Replace.. *replace what*? Replace the feature like the internal feature |
| YH | : *Replace*… it can *replace like..* <br> (*Unresolved recast*) |
| TY | : *Replace..* things.. *Replace..* <br> (*Unresolved recast*) |
| YH | : Calculators and also maybe.. they can jot down notes using the phone instead of using pens, they can get.. |
| TY | : *Re.. replace...* <br> (*Unresolved recast*) |

*Note.* Both L2 learners, TY and YH were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.28: A Sample of Unresolved Recast extracted from a Simple Triadic Discussion**

| | |
|---|---|
| KH | : I think that, I also agree about this. I think that gave them more freedom like will provide more chances for them to more understand better about themselves…its like…*I also don't know how to say..* |
| JY | : I think…<br><Unresolved recast> |
| WY | : But actually, if give them too much…hmm…too much freedom, I think is…problem because they still haven't matured yet…such as taking drugs because they want to try something new, they will get addicted…err…err…cannot be too free. |
| JY | : Actually, I fully don't agree this is good. |

*Note.* Three L2 learners, KH and JY and WY were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.29: A Sample of Unresolved Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CY | : Then what's the effect oh? I know these two la, the effect |
| CW | : For convenience lo |
| F | : Uh, effect…increase… how should we say leh, we have more time |
| CY | : More time to use |
| F | : *How to say the life is changing?* |
| CW | : Mm.. *I don't know*<br>*(Unresolved Recast)* |
| CY | : Came back to the causes lo.. |

*Note.* Three L2 learners, CW, F and CY were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

### 4.3.1.2.4 No Recast

As for the interactional phenomenon of *no recast*, it is a phenomenon where neither the learners used any techniques to correct each other's language errors. In this study, no recast phenomenon could be due to non-realization by either learner in the dyadic and triadic conversation. In other words, no attempt is shown to correct either learner's errors. The

following Tables 4.30 to 4.33 are some examples of the no recast phenomenon extracted from a part of dyadic and triadic conversations.

For instance, when F in table 4.31 used inappropriate verb, *reduced* in which JX might have not realized, instead of providing recast to correct her peer's error, she simply said *yea* and did not provide any recast. The inappropriate use of verb, *reduced* was not repaired in this case. There could be another possibility is that JX might have realized that F had wrongly used the word *reduce.*

Instead of attempting to correct her peer by suggesting more appropriate verb like *released* or *produced* in that context, she did not attempt to resolve that lexical issue but simply acknowledged her peer by saying, *yea* and then they switched the topic to something else.

**Table 4.30: A Sample of No Recast extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| JY | So, our causes, our causes here that you agree having good grades doesn't determine success in life.. |
| CF | Hmm, yea. |
| JY | ..is.. what? |
| CF | Because everyone need to master a soft skills, but not only with good results. If you, if you good in writing, reading... good at "tikam-tikam" la <malay language: simply answering>..ah, it's some does not need mean… *<whispering>: mei you yi yi ying wen jiao shen me oh..*<br>*< in English, it means 'what is meaningless in English'>*<br><L1 Chinese is used to ask for help in expressing point <mei you yi yi: meaningless> in English and Malay language is used to explain the point> |
| JY | jiang ba liao,  bu yong jing de<br><in English, it means just say it out, need not to worry><br>(*No recast but encouraged his peer to express his point in Mandarin*) |
| CF | it does not… *mei you yi yi ar*!<br>*< Prompted help with the repeated use of L1 Chinese Mandarin>* |
| JY | Oh! *Meaningless*. |

*Note.* Both L2 learners, JY and CF were discussing a simple task entitled "Having good grades does not determine success in life" as shown in  Appendix J3i.

**Table 4.31: A Sample of No Recast extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| F | : So, imagine you are surfing the Facebook or watching a video throughout the lecture class, what kind of effect will it have? |
| F | Signal *reduced* by the mobile phone can affect the body. So the first point is it will distracting the class, distract the class , distract ourselves, |
| JX | : *Yea...* |
| | (*No recast*) |

*Note.* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.32: A Sample of No Recast extracted from a Simple Triadic Discussion**

| | |
|---|---|
| CY | : So, what more freedom is that cause the effect to teenagers? |
| CW | : Okay, uh, maybe the teenager is controlled by their parents, but then teenager is easily influenced by their surrounding friends, classmates, whoever. Maybe this specifically, this specific teenager, is easily uhm… *bei dai huai?* <bei dai huai in Chinese Mandarin means being influenced in a negative manner> |
| F | : *Okay, that's a good point..* |
| | *(No recast)* |

*Note.* Three L2 learners, F and CY and CW were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.33: A Sample of No Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CY | : Improve our life qualities, what are the causes..? |
| CW | : Causes...? Effect..? |
| CY | : *Effect… Mm..* |
| | (*No recast*) |
| CW | : Effect is quality.. is it.. |
| F | : Yea.. |

*Note.* Three L2 learners, CW, F and CY were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

### 4.3.1.3 Uptakes of Recast

In this study, uptake of recast is a way a student reacts to the corrective feedback provided by his or her peer. There are four types of uptakes of recast found in this study, *modified uptakes, unmodified uptakes, acknowledgement*, and *no uptake*.

### 4.3.1.3.1 Modified Uptake of Recast

The modified uptake of recast is a way a student reacts to the corrective feedback given by his or her peer, in which the student modifies his or her utterance following the feedback given by his or her peers. The following Tables 4.34 to 4.37 are some examples of the modified uptake of recast extracted from dyadic and triadic conversations.

**Table 4.34: A Sample of Modified Uptake of Recast extracted from a Simple Dyadic Discussion**

| |
|---|
| JY : Maybe they can't be more independence, because after they come out to the society that they need to work, they need to.. uh, learn to survive, learn to how to manage their time, all these by themselves. But not, but not their parents only initiate this, unlike the school or at home, when we are small, when they are small, they are like schedule, okay, this time to this time you need to do homework, this time to this time you will wash your cloth or anything, but after, after they come out from society, it's totally different.. |
| JX : Yea, they also have the self-discipline right? |
| JY : Yea yea, self-discipline, more… *self-discipline* is more important, *can control oneself*. So, how about you? (Modified uptake) |

*Note.* Both L2 learners, JY and JX were discussing a simple task entitled "Having good grades does not determine success in life" as shown in  Appendix J3i.

**Table 4.35: A Sample of Modified Uptake of Recast extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| F | : Yes, same goes to me. This is the most common issue nowadays. Some uni allow students bring their hand phones to their class. And even the secondary school I heard that they have been permitted to bring their mobile phone in the class. I'm not sure if its every school that allow it. So, why why do you disagree with this ar ..bringing mobile phone into the class? |
| JX | : Because mobile phone will bring *distracting, this is distracting* to students, they cannot concentrate and focus on their studies |
| F | : It will *disrupt, disrupt* during the classes la.. <br> (*Modified uptake* from the meaning distracting) |
| JX | : Disrupt yea.. |

*Note.* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.


**Table 4.36: A Sample of Modified Uptake of Recast extracted from a Simple Triadic Discussion**

| | |
|---|---|
| YJ | : Okay lo.. can la.. now for effect.. or that one is effect oh, uh…no. Effect just say what happen if freedom is given ar? |
| YJA | : Mm <nodding head> |
| YJ | : Okay.. So, if we, freedom is given, kids are more….happy… |
| J | : happier… |
| YJ | : Happier, ah! |
| J | : *Stress-free, stressless*.. |
| YJ | : This is the..uh, the contoh <it means *example* in Malay language> of not given freedom.. you're very *stress, tired, pressure*… <br> (*Modified uptake*) |

*Note.* Three L2 learners, YJ and YJA and J were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.


**Table 4.37: A Sample of Modified Uptake of Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| JS | : Uh like.. the major resource is actually |
| ZH | : Yea.. |
| JS | : We think so to creating the [new] |
| ZH | : [new] |
| TE | : *Resources* |
| JS | : *Source source* |

Table 4.37 continued.

| | |
|---|---|
| ZH | : *Renewal sources* |
| JS | : Ah, *renewable sources to replace… regenerate energy* |
| | (*Modified uptake*) |

*Note.* Three L2 learners, JS, ZH and TE were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.


### 4.3.1.3.2 Unmodified Uptake of Recast

The unmodified uptake of recast is a way a student reacts to the corrective feedback given by his or her peer, in which the student does not modify his or her utterance although corrective feedback has been provided by his or her peers. The following Tables from 4.38 to 4.41 are some examples of unmodified uptake of recast extracted from dyadic and triadic peer interactions.

**Table 4.38: A Sample of Unmodified Uptake of Recast extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| F | : But, about about one fact we have to admit is that, by having good grade, we have a…arr, better kickstart. |
| JX | : Yea. [Higher chances,] |
| F | : [Better kickstart than other peoples] |
| JX | : …higher chances of getting hired |
| F | : But then the overall, overall performance will be will be… <hands gestures to look for a word>.. use to it, get used to it, afterwards.. |
| JX | : Yea.. |
| F | : So, What causes |
| JX | : What causes, I think what causes ar, I would like to say good *grades doesn't represent good life..* |
| F | : *Good grades doesn't represent good life…* |
| | (*Unmodified uptake*) |

*Note.* Both L2 learners, JX and F were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

**Table 4.39a: A Sample of Unmodified Uptake of Recast extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| F | : And like giving the lecturer……So, the point is that, the cause is it will show disrespect to the lecturer |
| JX | : Any more idea? It will also affect others |
| F | : *Distract* other, *disturb* others |
| JX | : Yea, *not only distracting*, *but distracting* |
| F | : So, *disturb the class* |
| JX | : Yes, *disturb the class* |
| | (*Unmodified uptake*) |

**Table 4.39b: A Sample of Unmodified Uptake of Recast extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| YH | : They can ask question? Says if they don't understand.. |
| TY | : Mm…not…not being teach by lecturer… |
| YH | : So, that means they can have their own discussion <whispering> |
| TY | : To record down what lecturer taught in class, *can refresh on … lecturer teaching*? <rising intonation> |
| YH | *Revise*..? |
| TY | Ah! *Revise*.. |
| | (*Unmodified uptake of recast*) |

*Note.* Both L2 learners, F and JX as well as YH and TY were respectively discussing a complex task on different occasions entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.40: A Sample of Unmodified Uptake of Recast extracted from a Simple Triadic Discussion**

| | |
|---|---|
| F | : Two causes, two effects.. mean have to give more causes for giving more freedom? |
| CW | : Teenagers should be given more freedom by the parent to allow teenager have time to *develop* their own interest and also personality. |
| F | : *Develop* yea.. more *develop*.. |
| | (*Unmodified uptake of recast*) |
| CY | : *Mm*.. |
| F | : This one is given more free time, given more freedom.. causes…causes mean why they should.. so that they can… |
| CW | : They can have more free time, they can have more free time, then another effect is they develop their interest.. |
| F | : If they have more *free time*, to *develop* uh, to *develop* |
| | (*Unmodified uptake of recast*) |

*Note.* Three L2 learners, F and CW and CY were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.41a: A Sample of Unmodified Uptake of Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CW | : So I think it allows us to travel further.. so you see, long time ago, they do not have technology, they don't have aircraft, then if you born in Malaysia, you can only stay in Malaysia, maybe you can walk to Thailand, this is *the far uh the further* you can get. With technology, now you got aircraft, and sometime you can go Paris or you can go Tokyo, |
| F | : *Travelling* lo |
| CY | : *Travelling*… <br> (*Unmodified uptake*) |
| CW | : You can go further |
| F | : Yea.. travelling.. |

**Table 4.41b: A Sample of Unmodified Uptake of Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CY | : Travelling to other place? More experience |
| F | : Gain gain… |
| CW | : *explore* your knowledge |
| CY | : Can *explore* <br> (*Unmodified uptake*) |
| F | : Can explore <br> (*Unmodified uptake*) |
| CW | : Explore your review |

**Table 4.41c: A Sample of Unmodified Uptake of Recast extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CF | : It's also save the cost right? Because we don't need to buy buy extra hard disk for file storing |
| JY | : Yea |
| CF | : They have the, a special they have the like 3TB or 2 TB.. |
| JX | : The *storation* |
| CF | : *Storation* <br> (Unmodified uptake) |
| JY | : Yea |

*Note.* Three L2 learners, CW, F and CY as well as CF, JX and JY were discussing a complex task on different occasions entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

#### 4.3.1.3.3 Acknowledgment

The unmodified uptake of recast is a way a student reacts to the corrective feedback given by his or her peer, in which the student only simply acknowledges the corrective feedback provided by his or her peers. The following Tables 4.42 to 4.45 are some examples of acknowledgment extracted from dyadic and triadic conversations.

**Table 4.42: A Sample of Acknowledgment extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| JX | : How about we start with… success in life doesn't mean having good grades? Haha |
| F | : How about we just say that in living health is more important than having good grades? This is about life. Because it says that, the task is asking whether having good grades does not determine success in life, so why do we agree with this statement. So I just say that, I agree with this statement is by having good grades does not determine success in life is because I think there is more than have many more more than the having good grade is a doesn't determine success in life, so I will say that health and living skill is more important. Because even if you have a good grade but you cannot survive by your own in the society, it means that you have to die |
| JX | : Yea.. |
| F | : So, is it okay? *living skills* and health |
| JX | : *Okay..* <whispering while writing> *living skill..* (*Acknowledgment*) |

*Note.* Both L2 learners, JX and F were discussing a simple task entitled "Having good grades does not determine success in life" as shown in Appendix J3i.

**Table 4.43: A Sample of Acknowledgment extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| JX | : Because mobile phone will bring distracting, this is distracting to students, they cannot concentrate and focus on their studies |
| F | : It will *disrupt, disrupt* during the classes la |
| JX | : *Disrupt yea..* (*Acknowledgment*) |

*Note.* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.44: A Sample of Acknowledgment extracted from a Simple Triadic Discussion**

| | |
|---|---|
| JM | : Whoa… so confused.. |
| B | : Yea… only two possible causes.. effects…. Obvious effects that is, <whispering while writing: the cause of family… a teenager is more open> what's another.. what's another effect? I don't know, what we able to learn from all these things, hopefully those are the things that are not too dangerous.. how thing is going to be like, the thing of the causes and effects is so much demanding |
| ZY: | Yea, there is … |
| B | : <teenagers should be given more freedom> another one could be, teenagers should be have their own what ah, view, responsible for their own action.. to take up responsibility to.. |
| ZY | : Take up responsibilities .. so the effects they will know *what's the consequences of doing those [bad things]* |
| B | : *[learning from mistakes]* |
| ZY | : *Yea*… what are the consequences.. |
| | (*Acknowledgment by saying yea*) |

*Note.* Three L2 learners, JM and B and ZY were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.45: A Sample of Acknowledgment extracted from a Complex Triadic Discussion**

| | |
|---|---|
| JM | : And so many more |
| B | : Oh..help help me man.. oh reduce the the first station, grocery at the technology increases science is coming more and more like, people are relying on science and superstitious, this cause us not to, you know do illogical stuff like prays to the sun, go and shit at trees |
| ZY | : *Yea yea*, praying.. |
| | (*Acknowledgment by saying yea yea*) |

*Note.* Three L2 learners, JM, B and ZY were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

### 4.3.3.4 No Uptake

No uptake of recast is a phenomenon in which a student did not react or does not respond to the feedback provided by his or her peer. The following Tables 4.46 and 4.49 are some examples of no uptake extracted from dyadic and triadic conversations.

**Table 4.46: A Sample of No Uptake extracted from a Simple Dyadic Discussion**

| | |
|---|---|
| CF | : Eh, if someone is too dependence on the other "count more", sources of learn, they, they have a, maybe they have a lot of money, already have time "parents/ friends", or what… <br> <using hand gestures to ask for help, running out of vocab to describe> <br> <whispering: zen yang jiang ar>.<in English, it means how to put it in words>. Hmm, like this ar, if someone is too dependence on their background, I think they will become, they cannot be independence ar, like they can maybe, they go outside or, work, work outsides, with the people they don't knows or not familiars, they will try to, always try to, the.. <br> <hand gestures to replace the unspeakable/inexpressible word> |
| JY | : Always want to, always want to depend on others? |
| CF | : *Ah!* <br> (*No uptake*) |
| JY | : …to done the work |
| CF | : *Ah!* <br> (*No uptake*) |
| JY | : ..assignment right? |
| CF | *Ah..!* <br> (*No uptake*) |
| JY | : You mean that right? |
| CF | : *Mmm..!* <br> (*No uptake*) |

*Note.* Both L2 learners, JY and CF were discussing a simple task entitled "Having good grades does not determine success in life" as shown in  Appendix J3i.


**Table 4.47: A Sample of No Uptake extracted from a Complex Dyadic Discussion**

| | |
|---|---|
| F | : There are more stuff…is that stubborn? |
| JX | : Is like.. |
| F | : Slow process? Stubborn is "gu zhi" <in Chinese Mandarin, it means stubborn> ar? |
| JX | : Yea, stubborn is gu zhi… less responsive? |
| F | : Oh…? <rising intonation> <br> (*No uptake*) |
| JX | : Less responsive can be like, less responsive can bring to the second point. If they use a lot of time to like Facebooking, they will like less responsive to like… |
| F | : Class… <br> (*No uptake*) |

*Note.* Both L2 learners, F and JX were discussing a complex task entitled "Using mobile phones in class brings more advantages than disadvantages" as shown in Appendix J4i.

**Table 4.48: A Sample of No Uptake extracted from a Simple Triadic Discussion**

| | |
|---|---|
| ZH | : Or..*Pan ni* <in English, it means rebellious>, what is it in English? |
| JS | : Punny? |
| ZH | : *Pan ni* |
| JS | : Oh.. |
| TE | : *Disobey* ah? |
| ZH | : *Oh?* |
| | (*No uptake*) |
| TE | : Don't know..I don't know eh.. |

*Note.* Three L2 learners, ZH and JS and TE were discussing a simple task entitled "Teenagers should be given more freedom by their parents" as shown in Appendix J5i.

**Table 4.49: A Sample of No Uptake extracted from a Complex Triadic Discussion**

| | |
|---|---|
| CF | : Maybe it will make a communication between the people more easier because we can call, video call and now, nowadays they appear for the whatssap, there are apps la, we.. we have used it before, the computer, this is a…a cartoon ah, it make by people |
| JY | : Oh, *alphabert alphabert uh?* |
| CF | : We, *we are out..* |
| JY | : *Oh we are out, okay* |
| | (*No uptake*) |
| JX | : True true.. <scratching head: confused look> so, now what should we write uh? |

*Note.* Three L2 learners, CF, JX and JY were discussing a complex task entitled "Technological interventions cause more harm than good in human life" as shown in Appendix J6i.

### 4.3.2 Quantitative Data (Peer Interaction)

A paired sample t-test was conducted to compare the effects of task complexity and task condition on peer interaction, in terms of NoM, LREs and Uptake of recast in dyadic and triadic group discussions of the argumentative topics set for simple and complex tasks.

### 4.3.2.1 Negotiation of Meaning

A paired-samples t-test was conducted to examine the effects of task complexity on the interactional features produced by L2 learners in dyadic and triadic groupings for simple and complex tasks, in terms of negotiation of meaning and its associated features such as clarification requests, confirmation checks and comprehension checks. As shown in Table 4.50, the paired-samples t-test revealed the comparison of means and standard deviations of clarification requests, confirmation checks and comprehension checks between dyadic and triadic peer interaction.

**Table 4.50: Comparison of Means and Standard Deviations of Negotiation of Meaning Features in Dyadic and Triadic Peer Interaction between Simple and Complex Tasks**

|  |  |  | Dyadic Grouping |  |  |  |  | Triadic Grouping |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Simple |  | Complex |  |  | Simple |  | Complex |  |
|  | *N* | *n* | *M* | *SD* | *M* | *SD* | *n* | *M* | *SD* | *M* | *SD* |
| Clarification Requests | 36 | 18 | 7.33 | 5.82 | 7.56 | 7.85 | 12 | 11.17 | 11.09 | 13.42 | 9.5 |
| Confirmation Checks | 36 | 18 | 4.94 | 6.09 | 4.83 | 3.71 | 12 | 4.75 | 4.22 | 6.67 | 6.23 |
| Comprehension Checks | 36 | 18 | 0.56 | 1.42 | 0.22 | 0.548 | 12 | 1.25 | 2.05 | 0.58 | 1.44 |

*Note.* Using alpha .10

*Dyadic Interaction: Simple and Complex Tasks (Clarification Requests)*

As stated in Table 4.50, there is no statistically significant difference in the interactional feature, clarification request for simple (*M*= 7.33, *SD*= 5.82) and complex (*M*=

7.56, *SD*= 7.85) tasks; *t*(17)= -.191, *p*= .851 during the dyadic discussion (see Tables W1 and X1 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Clarification Requests)*

There is no statistically significant difference in the interactional feature, clarification request for simple (*M*=11.17 *SD*= 11.09 and complex (*M*=13.42, *SD*=9.49) tasks; *t*(11)= -1.012, *p*= .333 during the triadic discussion (see Tables W1 and X1 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (Confirmation Checks)*

There is no statistically significant difference in the Negotiation of Meaning of L2, in terms of confirmation check for simple (*M*= 4.94, *SD*= 6.092) and complex (*M*= 4.83, *SD*= 3.714) tasks; *t*(17)= .077, *p*= .940 during the dyadic discussion (see Tables W1 and X1 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Confirmation Checks)*

There is no statistically significant difference in the interactional feature, confirmation check for simple (*M*= 4.75, *SD*= 4.224) and complex (*M*= 6.67, *SD*= 6.228) tasks; *t*(11)= -1.475, *p*= .168 during the triadic discussion (see Tables W1 and X1 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (Comprehension Checks)*

There is no statistically significant difference in the NoM of L2 learners, in terms of the interactional feature, comprehension check for simple (*M*= .56, *SD*= 1.423) and complex (*M*= .22, *SD*= .548) tasks; *t*(17)= .922, *p*= .369 during the dyadic discussion (see Tables W1 and X1 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Comprehension Checks)*

There is a statistically significant difference in the interactional feature, comprehension check for simple (*M*= 1.25, *SD*= 2.050) and complex (*M*= .58, *SD*= 1.443) tasks; *t*(11)= 2.345, *p*= .039 during the triadic discussion (see Tables W1 and X1 in Appendices W and X).

### 4.3.2.2 Language-related Episodes: Recast

A paired-samples t-test was conducted to examine the effects of task complexity on the interactional features produced by L2 learners in dyadic and triadic groupings for simple and complex tasks, in terms of language-related episodes that focused on the recast features such as correctly resolved recast. partially/ incorrectly resolved recast, unresolved recast and no recast. As shown in Table 4.51, the paired-samples t-test reveals the comparison of means and standard deviations of LREs recast, in terms of LRE correctly resolved recast, LRE partially or incorrectly resolved recast, LRE unresolved recast and no recast between dyadic and triadic peer interaction.

**Table 4.51: Comparison of Means and Standard Deviations of Language-related Episodes in Dyadic and Triadic Peer Interaction between Simple and Complex Tasks**

| | | | Dyadic Grouping | | | | | Triadic Grouping | | | |
| | | | Simple | | Complex | | | Simple | | Complex | |
| | N | n | M | SD | M | SD | n | M | SD | M | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LRE Resolved Recast | 36 | 18 | 1.78 | 2.07 | 1.83 | 1.15 | 12 | 2.5 | 3.48 | 2.75 | 2.45 |
| LRE Partially/ Incorrectly Resolved Recast | 36 | 18 | 1.5 | 1.2 | .78 | .878 | 12 | 1.25 | 1.485 | .92 | 1.505 |
| LRE Unresolved Recast | 36 | 18 | .39 | .778 | .72 | 1.27 | 12 | .83 | 1.53 | .75 | 1.49 |
| No Recast | 36 | 18 | 1.06 | 1.51 | 1.33 | 1.65 | 12 | 1.58 | 2.23 | 1.0 | 1.13 |

*Note.* Using alpha .10

*Dyadic Interaction: Simple and Complex Tasks (Correctly resolved recast)*

There is no statistically significant difference in the interactional feature, correctly resolved LREs for simple (*M*= 1.78, *SD*= 2.074) and complex (*M*= 1.83, *SD*=1.150) tasks; $t(17)=-.139$ , *p*= .891 during the dyadic discussion (see Tables W2 and X2 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Correctly resolved recast)*

There is no statistically significant difference in the interactional feature, correctly resolved LREs for simple (*M*= 2.50, *SD*=3.477) and complex (*M*= 2.75, *SD*=2.454) tasks; $t(11)=-.358$, *p*= .727 during the triadic discussion (see Tables W2 and X2 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (Partially/ Incorrectly resolved recast)*

There is a statistically significant difference in the interactional feature of partially or incorrectly resolved LREs for simple (*M*= 1.50, *SD*=1.20) and complex (*M*=.78 ,*SD*=.878) tasks; $t(17)=3.010$ , *p*= .008 during the dyadic discussion (see Tables W2 and X2 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Partially/ Incorrectly resolved recast)*

There is no statistically significant difference in the interactional feature of partially or incorrectly resolved LREs for simple (*M*= 1.25, *SD*= 1.485) and complex (*M*= .92, *SD*=1.505) tasks; *t*(11)= .886, *p*= .394 during the triadic discussion (see Tables W2 and X2 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (Unresolved recast)*

There is no statistically significant difference in the interactional feature, unresolved LRE for simple (*M*= .39, *SD*= .778) and complex (*M*= .72 , *SD*=1.274) tasks; *t*(17)=- .922 , *p*= .369 during the dyadic discussion (see Tables W2 and X2 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Unresolved recast)*

There is no statistically significant difference in the interactional feature, unresolved LRE for simple (M= .83, *SD*=1.528 ) and complex (*M*= .75, *SD*=1.485 ) tasks; *t*(11)= .123, *p*= .905 during the triadic discussion (see Tables W2 and X2 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (No recast)*

There is no statistically significant difference in the phenomenon whereby no recast was provided in the LREs for simple (*M*= 1.06, *SD*= 1.514) and complex (*M*=1.33, *SD*=1.645) tasks; *t*(17)=- .792 , *p*= .439 during the dyadic discussion (see Tables W2 and X2 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (No recast)*

There is no statistically significant difference in the phenomenon whereby no recast was provided in the LREs for simple (*M*=1.58, *SD*=2.234) and complex (*M*= 1.00, *SD*=1.128) tasks; *t*(11)= 1.292, *p*= .223 during the triadic discussion (see Tables W2 and X2 in Appendices W and X).

### 4.3.2.3 Uptake of Recast

A paired-samples t-test was conducted to examine the effects of task complexity on the interactional features produced by L2 learners in dyadic and triadic groupings for simple and complex tasks, in terms of their uptake of recast that focused on certain uptake features such as modified uptake, unmodified uptake, acknowledgment and no uptake as shown in Table 4.52.

**Table 4.52: Comparison of Means and Standard Deviations of Uptake of Recast in Dyadic Peer Interaction between Simple and Complex Tasks**

| | | | Dyadic Grouping | | | | | Triadic Grouping | | | |
| | | | Simple | | Complex | | | Simple | | Complex | |
| | *N* | *n* | *M* | *SD* | *M* | *SD* | *n* | *M* | *SD* | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Uptake (Modified) | 36 | 18 | 1.17 | 1.10 | 1.5 | 1.3 | 12 | 1.33 | 1.16 | 2.42 | 2.02 |
| Uptake (Unmodified) | 36 | 18 | .67 | 1.09 | 1.17 | .99 | 12 | 1.58 | 1.88 | 3.42 | 2.54 |
| Acknowledgment | 36 | 18 | .78 | 1.31 | .33 | .59 | 12 | .33 | .89 | .58 | .79 |
| No Uptake | 36 | 18 | .61 | 1.30 | .67 | 1.03 | 12 | .17 | .39 | .17 | .39 |

*Note.* Using alpha .10

*Dyadic Interaction: Simple and Complex Tasks (Modified Uptake of Recast)*

There is no statistically significant difference in the interactional feature of modified uptake for simple (*M*= 1.17, *SD*=1.098) and complex (*M*=1.50, *SD*=1.295) tasks; *t*(17)= -

1.304, $p$= .210 during the dyadic discussion (see Tables W3 and X3 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Modified Uptake of Recast)*

There is no statistically significant difference in the interactional feature of modified uptake for simple ($M$= 1.33, $SD$=1.155) and complex ($M$=2.42, $SD$= 2.021) tasks; $t$(11)= -1.569, $p$= .145 during the triadic discussion (see Tables W3 and X3 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (Unmodified Uptake of Recast)*

There is no statistically significant difference in the interactional feature of unmodified uptake for simple ($M$=.67, $SD$=1.085) and complex ($M$=1.17, $SD$= .985) tasks; $t$(17)= -1.489, $p$= .155 during the dyadic discussion (see Tables W3 and X3 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Unmodified Uptake of Recast)*

There is a statistically significant difference in the interactional feature of unmodified uptake for simple ($M$= 1.58, $SD$=1.881) and complex ($M$= 3.42, $SD$= 2.539) tasks; $t$(11)= -2.640, $p$= .023 during the triadic discussion (see Tables W3 and X3 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (Acknowledgment)*

There is no statistically significant difference in the interactional feature of acknowledgment for simple (*M*= .78, *SD*=1.309) and complex (*M*=.33, *SD*=.594) tasks; *t*(17)= 1.572, *p*= .134 during the dyadic discussion (see Tables W3 and X3 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Acknowledgment)*

A paired-samples t-test was conducted to compare the feature of triadic interaction in simple and complex tasks, in terms of acknowledgment L2 learners' uptake. There is no statistically significant difference in the interactional feature of acknowledgment for simple (*M*= .33, *SD*=.888) and complex (*M*= .58, *SD*=.793) tasks; *t*(11)= -1.000, *p*= .339 during the triadic discussion (see Tables W3 and X3 in Appendices W and X).

*Dyadic Interaction: Simple and Complex Tasks (No Uptake)*

There is no statistically significant difference in the interactional feature of no uptake for simple (*M*= .61, *SD*=1.290) and complex (*M*= .67, *SD*=1.029) tasks; *t*(17)= -.236, *p*= .816 during the dyadic discussion (see Tables W3 and X3 in Appendices W and X).

*Triadic Interaction: Simple and Complex Tasks (Acknowledgment)*

There is no statistically significant difference in the interactional feature of no uptake for simple (*M*=.17, *SD*= .389) and complex (*M*= .17, *SD*= .389) tasks; *t*(11)= 000, *p*= 1.000 during the triadic discussion (see Tables W3 and X3 in Appendices W and X).

## 4.4 Summary

This chapter has tabulated, analyzed, and discussed the spoken data and written data in qualitative and quantitative manners. The findings for the first research question, pertaining to the effects of task complexity and task condition on the L2 individual writing in terms of the lexical and syntactic complexities, grammatical accuracy and fluency, revealed that there was a statistically significant effects of task complexity and task condition on the lexical complexity, in terms of MSTTR. L2 learners produced more variety of word choice when writing a complex task, especially after the triadic peer interaction.

As for the results of syntactic complexity, there was also a statistically significant effect of task complexity and task condition as L2 learners produced more complex sentence structures in their L2 individual writing in the complex task after the triadic peer interaction. However, L2 learners seemed to produce more dependent clause per clause in their individual L2 writing for the simple task, as the statistically significant effect of task condition were seen on the L2 learners' individual L2 writing, after their dyadic peer interaction.

With regard to the dimension of coordinate phrase per T-unit, a statistically significant effect of task complexity was evident as L2 learners produced higher coordinate phrases in the L2 individual writing regardless of any grouping of prior peer interaction.

With regard to grammatical accuracy, only task complexity had a statistically significant effect on error-free clauses (EFC) in the L2 learners' individual writing. L2 learners seemed to produce more EFC when writing the complex task individually, regardless of prior peer interaction.

As for fluency of the L2 individual writing, task complexity had no statistically significant effect on words per t-unit. However, there was a statistically significant effect of

task condition on the fluency of individual written production. The results revealed that the fluency of the individual writing after triadic peer interaction was lower as compared to after dyadic and individual peer interactions.

Regarding the text length of the L2 individual writing, task complexity had a statistically significant effect on the L2 learners' text length as they produced lengthier individual text for complex tasks.

Interestingly, task condition also had a statistically significant effect on the text length produced in the individual writing as L2 learners seemed to produce the lengthiest text in the individual session when there was no prior peer interaction, followed by the prior triadic peer interaction and dyadic peer interaction.

With regard to the second research question pertaining to whether or not task complexity and task condition affected peer interaction, in terms of Negotiation of Meaning (NoM), Language-related Episodes (LREs) and Uptakes of recast. The results revealed that there was no statistically significant effect of task complexity and task condition on the NoM's interactional features, i.e. clarification request and confirmation check, but there was a statistically significant effect on the comprehension check. L2 learner speakers tended to ask if others had understood their preceding utterance in the triadic peer interaction when discussing simple tasks.

As for the peer interaction, LREs, there was no statistically significant effects of task complexity and task condition on the interactional features, i.e. *correctly resolved LREs*, *unresolved LREs*, and *no recast* phenomenon. However, there was a statistically significant effect and task condition on the interactional feature, i.e. *partially* or *incorrectly resolved*

*LREs*, as L2 learners attempted to resolve the inappropriate words and ill-structured sentences more when discussing simple tasks in the dyadic discussion.

Lastly, with regard to the peer interaction of the uptakes of recast, in terms of the *modified uptake of recast*, *unmodified uptake of recast*, *acknowledgment* and *no uptake* phenomenon, the results revealed that there was no statistically significant effects of task complexity and task condition on the interactional features, i.e. *modified uptake*, *acknowledgment*, and *no uptake* phenomenon. However, there was a statistically significant effect of task complexity and task condition on the unmodified LREs as L2 learners tended to adopt recast without modifying when discussing complex tasks in the triadic peer interaction.

Overall, the results of the effects of the task complexity and task condition for the L2 individual writing seemed to partially support the Cognition Hypothesis whereas the findings for the different groupings of peer interaction seemed to reveal mixed results. The implications of the statistical findings are discussed in the following chapter.

# CHAPTER 5: DISCUSSION

## 5.1 Introduction

This study has investigated the effects of task complexity and task condition on the L2 individual written production and peer interaction. To this end, the Cognitive Hypothesis is adopted to underpin the study. This chapter provides a discussion of findings from qualitative and quantitative strands of analysis.

The first part of the discussion explains the effects of the task complexity and task condition on the L2 individual writing, in terms of the global linguistic measures, complexity, accuracy and fluency. The second part of this chapter provides a discussion on the effects of task complexity and task condition on the different groupings of task condition for peer interactions. Wherever possible, the findings of this study were compared to the findings investigated in the preceding studies about the effects of task features on L2 written CAF and peer interaction, in terms of NoM, LREs and uptakes.

Data for the L2 individual argumentative writing tasks were analysed and coded with CAF while the peer interactional data collected from the dyadic and triadic groupings were transcribed, analysed, coded and quantified, in order to answer the following research questions:

1. Is there a statistically significant effect of task complexity (simple vs complex task) and task condition (individual vs dyadic vs triadic grouping) on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency* in L2 individual writing?

2. Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning, Language Related Episodes and Uptake on two task conditions (dyadic vs triadic grouping)?

Robinson's Cognition Hypothesis (2001, 2003, 2005, 2007) claims that increasing the cognitive demands of tasks along certain dimensions will, firstly, push learners to greater accuracy and complexity of L2 production in the condition to meet the greater functional and conceptual communicative demands inherited in the complexity of the task. At the same time, tasks that are cognitively more challenging also stimulate interaction, and heightened attention to and memory for input, so increasing learning from the input; as well as promote longer-term retention of input. With that, when learners are conditioned to perform from simple to complex sequences; it will lead to automaticity and efficient scheduling of the components of complex L2 task performance.

Overall, the results of the effects of the task complexity on the L2 individual writing seemed to support the Cognition Hypothesis, in terms of the lexical complexity and all three dimensions of the syntactic complexity as well as fluency. As for the findings for the dyadic and triadic groupings of peer interaction, it seemed to reveal mixed results. The findings of the current study are discussed from these strands.

## 5.2 Second Language Individual Writing

Research question 1:

Is there any significant difference when increasing task complexity in terms of *causal reasoning demands* along with an increase in the number of participants: *individual*, *dyadic* and *triadic* on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency* in L2 individual argumentative writing?

### 5.2.1 Complexities

Based on the pedagogic claim of the Cognitive Hypothesis (Robinson, 2001b. 2003b, 2005a, 2011b, 2015), cognitive demands of tasks sequenced from simpler to more complex following relevant parameters of task demands allow learners to produce wider and more varied range of lexis and more sophisticated sentence structures. To evaluate lexical complexity, mean segmental type/ token ratio-50 (MSTTR-50) was adopted to measure to what extent task complexity affects the varied use of vocabularies in each individual L2 written text. To evaluate syntactic complexity, mean length of clauses (MLC), dependent clause per clauses (DCC) and coordinate clause per T-unit (CPT) were adopted to measure the effects of task complexity on syntactic complexity in the L2 individual written production.

The following sub-sections discuss the results obtained from the effects of task complexity and task condition on the L2 individual CAF, from the perspectives of theoretical claims made by the Cognition Hypothesis, methodology and pedagogy. The findings were also discussed with the existing body of knowledge of the previous literature.

### 5.2.1.1 Lexical Complexity (MSTTR)

The primary hypothesis being tested in this study was cognitive demands between simple and complex tasks on the lexical complexity, in terms of the Mean Segmental Type/ Token Ratio (MSTTR). The mixed method study indicated that there was a statistically significant difference with the effects of task complexity on the MSTTR-50. In addition, task condition was found to be statistically different on the process of lexicalization in the L2 individual writing, especially for the triadic grouping. The L2 individual written text produced after the triadic peer interaction seemed to yield higher number of varied lexis as compared to the dyadic and individual sessions. The means of the overall interaction between task complexity and task condition on MSTTR-50 was statistically significant.

As anticipated by the Cognition Hypothesis, for the measure of the lexical complexity in the L2 individual writing, increasing task complexity from simple to complex statistically increased the production of lexical complexity, namely the MSTTR-50. This finding supports some prior research that looked into the effects of task complexity on the L2 written lexical complexity (Kormos, 2011; Kuiken & Vedder, 2007; 2008; 2009; 2011; 2012; Rahimi, 2018), however, it is in opposition to few prior research (Frear & Bitchener, 2015; Norris & Ortega, 2009).

The theoretical claims made by the Cognition Hypothesis is that increasing task complexity stimulates learners to produce higher number of varied and sophisticated vocabulary. In this study, the finding of MSTTR-50 seemed to support the prediction of the Cognition Hypothesis that more complex tasks induced learners to expand their attentional, memory, reasoning and other information processing resources to produce a variety of words in order to meet the communicative and functional demands (Robinson, 2001b, 2003b, 2005, 2007a) set in the complex tasks.

This study, for instance, required L2 learners to provide different number of reasoning about the causes and effects in two different complexity levels of the argumentative writing, complex tasks (+ causal reasoning demands, 6 causes and 6 effects) versus simple tasks (- causal reasoning demands, 2 causes and 2 effects). The cognitively more complex tasks prompted the learners to adjust and stretch their interlanguage resources to meet the communicative and functional demands (Robinson, 2015). This cognitive processing potentially directed learners' attention to linguistic units and it promoted the "noticing" (Schmidt, 2001) of form and concept mappings that led to interlanguage development (Robinson, 2015), for internalisation to take place. Thus, complex tasks yielded a greater number of the varied lexis in the L2 individual argumentative writing.

Interestingly, increasing the number of participants for peer discussion pertaining to the simple task prior to their L2 individual writing from individual to triadic grouping statistically decreased the MSTTR-50, the use of a variety of words in their L2 individual writing. However, increasing the number of participants for peer discussion prior to complex tasks prior to their L2 individual writing from individual to triadic grouping statistically increased the MSTTR-50, lexical complexity in their L2 individual writing. As for the baseline data shown in the individual session revealed that MSTTR-50 produced in the complex task is lower than in the simple task. This phenomenon suggested that task condition, in terms of the number of participants involved in the peer interaction played a crucial role along with manipulation of task complexity as the synergistic interaction of both task features from the cognitive and interactive factors provided positive impact on the production of the L2 individual lexical complexity.

Thus, the finding suggests that not only task complexity affects the cognitive system of the L2 learners in processing information for L2 production, task condition in terms of

arranging learners into pair or group for peer interaction also moderates L2 learners cognitive processing and their interlanguage system.

Especially, when more participants involved in the peer interaction, that is, the number of participants was increased from individual, to dyadic and triadic peer interaction, prior to their individual writing, it facilitated L2 learners to produce a higher variety of lexis. This occurrence seemed to be aligned with the hypothesis made by the Cognition Hypothesis that, complex tasks triggered each participant's unlimited attentional resources to attend to multiple linguistic aspects, in this case, the lexis (Robinson, 2001a, 2001b, 2003, 2005, 2007).

In accordance with the concepts of having multiple pools of attentional resources in the brain structures (Allport, 1987; Wickens, 2008; Wickens & McCarley, 2007), Robinson also proposes that L2 learners can equally attend to form (linguistic) and meaning (content) at no expense of L2 accuracy and complexity. This is due to the sufficient capacity in the multiple pools of attentional resources to process (store and retrieve) the linguistic aspects (Robinson, 2001a, 2001b, 2005).

When more participants involved in the discussion of a task that is cognitively more challenging, more pools of attentional resources were being triggered, retrieved and processed. In the triadic peer interaction, it seemed that the attention towards the lexical complexity is heightened especially after being pooled from multiple resources of more number of participants. Thus, L2 learners produced a greater number of varied vocabulary in the complex L2 individual writing, especially after the triadic peer interaction.

The distinct finding of this study showed that there was a statistically significant effect of the overall interaction between task complexity and task condition on the MSTTR-

50. This finding suggests that task complexity might not be the sole pedagogic variable that affected the L2 lexical complexity, because task condition with increased number of participants in their peer interaction produced higher lexical complexity. This could be due to the increased occurrence of the learning opportunities produced during the peer discussion, which had not only stretched each interlanguage system, but also pooled the stretched interlanguage system together and thus directed their attentional mechanisms, memory and information processing resources to maximize the use of lexical variety in the L2 individual writing.

This finding contributed to the existing body of knowledge pertaining to the effects of task complexity on the L2 written modality that task condition with three participants involved in the peer interaction worked well tasks that are cognitively more complex. These combined effects of task complexity and task condition produced an increased impact on the lexical complexity in the L2 individual written production.

### 5.2.1.2 Syntactic Complexity (Mean Length of Clause)

The following hypothesis being tested in the study was the effects of the simple and complex tasks and the number of participants in the peer interaction on the L2 individual written syntactic complexity. The findings of this study indicated that there was a statistically significant effect of task complexity on the syntactic complexity, in terms of the Mean Length of Clause (MLC). The L2 learners produced higher mean length of clauses in the more complex tasks. Additionally, task condition was found to be statistically impacted the L2 individual written syntactic complexity, especially after the triadic peer interaction. After the triadic grouping peer interaction, L2 learners produced higher number of MLC as compared

to the dyadic peer interaction and individual session, which has no peer interaction at all. However, the findings of the overall interaction between task complexity and task condition showed that there was no statistically significant on the mean length of clauses.

As anticipated by the Cognition Hypothesis, increasing task complexity from simple to complex in dyadic and triadic groupings statistically increased the syntactic complexity, the mean length of clause, in the L2 individual written production. This finding contradicts those of some prior research (Cho, 2015; Frear & Bitchener, 2015; Kuiken & Vedder, 2007, 2008, 2012) but supports some previous studies (Ishikawa, 2007; Robinson, 2011; Ruiz-Funes, 2015). The theoretical claims made by the Cognition Hypothesis is that increasing task complexity triggers learners to generate higher number of syntactic complexity. More complex tasks prompt learners to expand their attentional, memory, reasoning and other information processing resources in order to meet the communicative and functional demands (Robinson, 2001b, 2003b, 2005, 2007a).

As mentioned earlier, this study, required L2 learners to provide 6 causes and 6 effects in the more complex argumentative writing task. The finding revealed that the cognitively more complex tasks elicited the learners to regulate and expand their interlanguage resources to meet the communicative and functional demands (Robinson, 2015). This phenomenon might have enabled the cognitive processing of the L2 learners in which it directed their learners' attention to linguistic units and it promoted the "noticing" (Schmidt, 2001) of form and concept mappings that led to interlanguage development (Robinson, 2015), for internalisation to take place. Thus, complex tasks produced a higher number of more complex sentence structure, in terms of the mean length of clause in the L2 individual argumentative writing.

Interestingly, the baseline data, individual session showed that no peer interaction prior to the simple L2 individual writing produced higher syntactic complexity as compared to the complex L2 individual writing. The peer interaction in the triadic grouping prior to the complex L2 individual writing produced higher mean length of clause as compared to the simple L2 individual writing. This finding suggests that complex tasks stimulated each participant's multiple pools of attentional resources in order to process the linguistic aspects (Robinson, 2001a, 2001b, 2003, 2005, 2007) to meet the communicative and functional demands inherited in the complex tasks. That is to say, when more participants interacted with each other regarding a complex task, their interlanguage system was processed, stretched, and pooled.

The available salient input provided by their peers might have directed their attention to the focus on the syntactic formation in order to achieve the functional demands required by the complex task. Thus, the prior interaction in the triadic grouping enabled L2 learners to expand their interlanguage system and pool the immediate salient input from the surrounding, which resembled a social context for learning opportunities available, L2 leaners produced more complex sentence structures in the complex individual L2 writing.

### 5.2.1.3 Syntactic Complexity (Dependent Clause per Clause)

The second dimension of the syntactic complexity this study looked into was the dependent clause per clause (DCC). The findings of this study showed that the effects of the cognitive demands inherited in the simple and complex tasks had a statistically significant difference on the syntactic complexity, DCC. Surprisingly, L2 learners produced more dependent clauses more in the simple tasks in which this finding did not seem to support the

claims made by the Cognition Hypothesis. Also, task condition was found to be statistically significant different, especially for the L2 individual writing after the dyad grouping peer interaction; as compared to the triadic peer interaction and the individual session in which there was no peer interaction. Regarding the effect of the overall interaction between task complexity and task condition, there was no statistically significant difference on the DCC.

As anticipated by the Cognition Hypothesis, in the baseline data, the individual session, increasing task complexity from simplex to complex in the individual session statistically increased the DCC in the L2 individual writing. The L2 learners who performed in the individual session complex task without any prior peer interaction yielded desired results as predicted by Robinson, that more complex task produces more complex sentence structures. The finding revealed that the cognitively more complex tasks elicited the learners to regulate and expand their interlanguage resources to meet the communicative and functional demands (Robinson, 2015) only in the individual session when no peer interaction involved prior to their L2 individual writing. This finding supported those of the previous studies (Ishikawa, 2007; Robinson, 2011; Ruiz-Funes, 2015). However, the effects of task complexity yielded opposite results when task condition, in which participants were grouped in pair and triad for peer interactions, prior to their L2 individual writing.

When the number of participants was increased in the dyadic and triadic peer interaction prior to the individual L2 writing, L2 learners seemed to produce lesser dependent clauses in the complex tasks compared to the simple tasks. These findings contradicted with the Cognition Hypothesis, but lent support to those of previous studies (Cho, 2015; Frear & Bitchener, 2015; Kuiken & Vedder, 2007, 2008, 2012). This suggests that when tasks are cognitively more challenging, more pools of attentional resources from more number of

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participants focused on producing more ideas that came with varied vocabulary, but at the expense of the composition of dependent clauses.

Overall, when it comes to L2 individual written syntactic complexity, DCC, when L2 learners attempted the complex task in the individual session, it seemed that they could pay more attention and access to their cognitive system more triumphantly that they produced higher number of complex sentence structures, DCC in the complex task. This suggests that they could retrieve their attentional, memory, reasoning and other information processing resources more effectively when they were given some "me time" to think through the task, evaluate, reason and reflect. This phenomenon might have enabled the cognitive processing of the L2 learners in which it directed their learners' attention to linguistic units and it promoted the "noticing" (Schmidt, 2001) of form and concept mappings that led to interlanguage development (Robinson, 2015), for internalisation to take place. Thus, complex tasks produced a higher number of more complex sentence structure, in terms of the dependent clause in the L2 individual argumentative writing.

This interesting finding resembles a saying, which is; too many cooks spoil the broth. Robinson's Cognition Hypothesis predicts that increasing task complexity elicits learners to generate a higher number of syntactic complexity since tasks that are designed cognitively more demanding tend to prompt learners to expand their attentional, memory, reasoning and other information processing resources in order to meet the communicative and functional demands (Robinson, 2001b, 2003b, 2005, 2007a).

However, when more participants are involved in a peer interaction, for them to notice, encode the language input and produce the linguistic output, in terms of the dependent clause written production might have not been as effective as producing varied lexis. In this case, it seems that the trade-off effects occurred within the dimensions of syntactic

complexity, which was the increased number of mean length clause, but at the expense of dependent clause per clause of the L2 individual writing.

This indicates that peer interaction prior to their L2 individual writing does not necessarily enhance the sophistication of sentence structures in the complex tasks. The L2 learners might have not been able to encode the input effectively and therefore, produced simpler sentence structures in order to convey the meaning in their L2 writing.

When L2 learners attended to the cognitively more complex, at the same time with too many contributions of ideas and meaning involved in the peer discussion, this phenomenon might have burdened the cognitive system of the L2 learners. The over-burdened mental workload might have blurred the "noticing" stage of the L2 learners, in which was supposed to assist them to encode the linguistic units and expand their interlanguage system for the L2 language production.

### 5.2.1.4 Syntactic Complexity (Coordinate Clause per T-unit)

The third dimension of the syntactic complexity this study looked into was the Coordinate clause per T-unit (CPT). The findings of this study showed that the effects of the cognitive demands inherited in the simple and complex tasks had a statistically significant difference on the syntactic complexity; CPT. It was found that complex tasks yielded more CPT in the L2 individual writing. This finding contradicts those of some prior research (Cho, 2015; Frear & Bitchener, 2015; Kuiken & Vedder, 2007, 2008, 2012) but supports some previous studies (Ishikawa, 2007; Robinson, 2011; Ruiz-Funes, 2015).

The theoretical claims made by the Cognition Hypothesis is that increasing task complexity elicits learners to produce higher number of syntactic complexity as it prompts

L2 learners to expand their attentional, memory, reasoning and other information processing resources in order to meet the communicative and functional demands (Robinson, 2001b, 2003b, 2005, 2007a).

However, the effects of task condition was found to be not statistically significant different, on the L2 individual written coordinate clause. Interestingly, regarding the effect of the overall interaction between task complexity and task condition, there was a statistically significant difference on the CPT.

### 5.2.2 Accuracy

According to the pedagogic claim of the Cognitive Hypothesis (Robinson, 2001b. 2003b, 2005a, 2011b, 2015), cognitive demands of tasks sequenced from simpler to more complex following relevant parameters of task demands allow learners to produce higher grammatical accuracy. To evaluate accuracy, error-free clause was adopted to measure to what extent the task complexity affects L2 grammatical accuracy in the individual written production.

#### 5.2.2.1 Grammatical Accuracy (Error-Free Clauses)

The following hypothesis being tested in this study was the effects of the cognitive demands between simple and complex tasks on grammatical accuracy. The current study indicated that there was a statistically significant difference of task complexity on the grammatical accuracy, in terms of the Error-free Clauses (EFC). The findings showed that L2 learners produced greater grammatical accuracy in complex tasks. However, task condition was not statistically significant different in composing grammatically accurate

clauses. The means of the overall interaction between task complexity and task condition on grammatical accuracy was also not statistically significant different.

As anticipated by the Cognition Hypothesis, increasing task complexity from simple to complex statistically increased the accuracy, the error-free clauses (EFC), in the L2 individual written production. This finding supports some previous studies (Ishikawa, 2007; ; Kuiken & Vedder, 2007, 2008, 2012; Robinson, 2011; Ruiz-Funes, 2015) but contradicts those of some prior research (Cho, 2015; Rahimi, 2018). The theoretical claims made by the Cognition Hypothesis is that increasing task complexity stimulates learners' cognitive system to stretch in order to pay attention to the linguistic unit, in this case, grammatical accuracy.

Thus, they were able to generate higher number of grammatically accurate clauses when their interlanguage system was triggered by the cognitively more complex task. It is claimed that more complex tasks prompt learners to expand their attentional, memory, reasoning and other information processing resources in order to meet the communicative and functional demands (Robinson, 2001b, 2003b, 2005, 2007a).

The finding of EFC revealed that cognitively more complex tasks elicited the learners to regulate and expand their interlanguage resources to meet the communicative and functional demands (Robinson, 2015). This phenomenon have enabled the cognitive processing of the L2 learners, in which it directed their attention to linguistic units; thus it promoted the "noticing" (Schmidt, 2001) of form and concept mappings that led to interlanguage development (Robinson, 2015), for internalisation to take place. Consequently, complex tasks produced a higher number of more accurate clausal structures, in terms of the error-free clauses in the L2 individual argumentative writing.

The baseline data, individual session, showed that L2 learners performed more accurately in the simple task than in the complex task. Although task condition did not seem to statistically affect the EFC, when analyzing the complex tasks in different number of groupings, the findings showed that increasing task complexity increased the EFC in their L2 individual writing, especially after the triadic and dyadic peer interactions.

Overall, it seems that when L2 learners performed the complex task in the individual session, there were some trade-off effects on the production of EFC in L2 individual writing. The simple task set in this study was 2 causes and 2 effects whereas the complex tasks was 6 causes and 6 effects. L2 learners seemed to have divided their attentional resources between processing for content and processing for linguistic form when attempting the complex task.

This could be due to the requirements set in the complex task might have caused the L2 learners to divide their attention more to generating ideas for 6 causes and 6 effects, at the expense of grammatical accuracy production. This trade-off phenomenon was proposed by Skehan in which his earlier model was knows as the Limited Attentional Capacity Model (Skehan, 2009; Skehan, 1998; Skehan & Foster, 2001).

The findings showed that L2 learners were able to write grammatically more accurate clauses in the complex task, especially after the triadic and dyadic peer interactions. This indicated that having more participants to discuss a complex task contributes to more accurate individual L2 writing. When an L2 learner has to perform a complex task alone, the learner is likely to encounter some trade-off effects, that is, he or she could attend to the complexity level of a task but at the expense of the accuracy.

### 5.2.3 Fluency

According to the pedagogic claim of the Cognitive Hypothesis (Robinson, 2001b. 2003b, 2005a, 2011b, 2015), tasks that are designed cognitively more complex only positively affect L2 learners to produce more varied lexical and syntactic complexities as well as higher grammatical accuracy, but not fluency. According to the theoretical claims by the Cognition Hypothesis, the focal hypothesis tested in this study was the cognitive demands between simple and complex tasks on lexical and syntactic complexities as well as grammatical accuracy. However, to evaluate to what extent task complexity would affect the L2 individual written fluency, the measures of the total word per total T-units as well as the text length were used as the measures to analyse the task effects on fluency.

### 5.2.3.1 Fluency (Word per T-unit)

This study looked into the impact of task complexity and task condition on the L2 learners' individual written fluency even though the Cognition Hypothesis predicts that task complexity does not affect L2 learners' fluency. As anticipated by the Cognition Hypothesis, the overall findings indicated that there was not a statistically significant difference of task complexity on L2 learners' fluency, in terms of word per T-unit (W/T). However, task condition was statistically significant different in moderating the production of L2 individual written fluency, especially in the case of having fewer participants peer interaction prior to their L2 individual writing.

Regardless of task complexity, individuals performed more fluent individual L2 writing than the individual writing after the dyadic peer interaction while the dyads performed more fluent individual L2 writing than the individual writing after the triadic peer

interaction. However, the means of the overall interaction between task complexity and task condition on fluency was not statistically significant.

That is to say, increasing task complexity did not increase the W/T of the L2 individual writing. However, task condition had a statistically significant on the number of participants in the simple and complex tasks. The finding showed that the simple individual and simple triadic groupings produced higher W/T in the individual L2 writing. However, simple dyadic grouping produced lower W/T as compared to complex dyadic grouping. These findings seemed to also support the Cognition Hypothesis that task complexity only affects complexity, accuracy but not fluency. It shows that having more participants like three in a group tend to lead learners to focus on discussing the ideas for the complex task at the expense of the fluency of the L2 writing.

### 5.2.4 Text Length

Apart from word/ T-unit, this study also looked into the impact of task complexity and task condition on the L2 individual text length. The finding of the current study indicated that there was a statistically significant difference of task complexity on the text length. Tasks that are more complex produced lengthier L2 individual writing. Task condition was statistically significant different in producing lengthier L2 individual writing. The means of the overall interaction between task complexity and task condition on text length was statistically significant different.

The finding showed that increasing task complexity increased the text length especially when L2 learners were given the opportunities to interact with each other in the dyadic and triadic groupings, prior to their L2 individual writing. Interestingly, the baseline

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data, individual session, showed that performing the complex task without any prior peer interaction produced shorter text length as compared to performing in the individual simple task. Contradictorily, L2 learners seemed to produce lengthier individual texts for complex tasks after the dyadic and triadic peer interactions.

These findings indicated that a few learners with their multiple pools of attentional resources could contribute to more ideas in which it in turn increased the text length of their individual L2 writing. It also indicated that every individual learner might need to work with his or her peer to discuss and share the burden of providing ideas to the task. The overall findings showed that there was also a trade-off effect seen between task complexity and the number of participants involved in the task discussion.

The following section discusses the findings obtained from the peer interaction in dyadic and triadic groupings.

## 5.3 Peer Interaction

Research Question 2:

Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning, Language-Related Episodes and Uptake on two task conditions (dyadic vs triadic grouping)?

### 5.3.1 Negotiation of Meaning

Pedagogically, peer interaction has been integrated in L2 classrooms for a number of purposes, ranging from serving as primary vehicle for language development, as in task-based language teaching, to playing an important role to substitute the practice phase of more

traditionally-oriented approaches, such as present–practice–produce. A shift of teaching and learning paradigm is observed when communicative language teaching approach with the use of tasks as the platform for peer interaction is gradually adopted in a language classroom.

A considerable body of research has provided empirical evidence for claims about the benefits of peer interaction for L2 learning (Philp, Adams & Iwashita, 2013; Sato & Ballinger, 2016), with many studies focusing on L2 learners' interaction during oral tasks rather than writing tasks (Mackey, 2007). Ellis and Barkhuizen (2005) further explain that negotiation of meaning is the conversational exchanges occur when interlocutors try to prevent a communicative impasse or to rectify an actual communication breakdown.

As mentioned in Chapter Two, NoM is stemmed from the Interaction Hypothesis, established by Long (1985, 1996). It hypothesizes that interaction which involves negotiation of meaning facilitates the stage of conscious "noticing". Schmidt (1990, 1994) asserts that the "noticing" stage stimulates L2 learners' cognitive system to process the salient input for uptake more effectively. From the perspectives of the Cognition Hypothesis, Robinson (2001, 2003, 2005, 2007) also asserts that tasks that are designed cognitively more complex are likely to induce learners to negotiate the meaning in the interaction. This interactional phenomenon provides learning opportunity for language acquisition as the negotiation interactional features prompt learners to process and connect the input available, their interlanguage system, attentional resources and the linguistic output. The effects result from the interactional phenomenon is evident, especially when the more competent interlocutors provide the interactional adjustment during the communication impasse.

The three commonly found communicative strategies in the negotiation of meaning are clarification request, confirmation check and comprehension check.

### 5.3.1.1 Clarification Request

Clarification request is an expression created by interlocutors to elicit clarification of another interlocutor's preceding utterances during the negotiation strategy. For instance, "What did you say?" is one of the commonly used question phrase to request for clarification of the preceding utterances.

This study looked into the effects of the cognitive demands between simple and complex tasks on the NoM, in terms of clarification request. The current study indicates that task complexity did not yield any statistically significant difference on the interactional feature, in terms of clarification request, in either dyadic or triadic condition. That is to say, task condition was not statistically significant different in producing the interactional feature, clarification request.

This result seemed to oppose the Cognition Hypothesis (Robinson, 2001a, 2001b, 2003, 2005, 2007), since the L2 learners in this study, discussed complex tasks did not produce statistically high amount of interactional features in terms of negotiation of meaning, clarification requests.

### 5.3.1.2 Confirmation Check

Apart from that, the implicit feedback provided by peers, for instance confirmation checks are created to elicit confirmation that an utterance has been correctly heard or understood. Interlocutors normally use confirmation checks to ensure accurate comprehension is obtained. For example, an interlocutor may ask the speaker "Do you mean that…" to confirm of his or her understandings.

This study examined the effects of the cognitive demands between simple and complex tasks on the NoM, in terms of confirmation check. The current study indicated that

there was not a statistically significant difference of task complexity on the interactional feature, confirmation check in either dyadic or triadic peer interaction. In addition, task condition was not statistically significant different in producing the confirmation check.

This result seemed to oppose the Cognition Hypothesis (Robinson, 2001a, 2001b, 2003, 2005, 2007), since the L2 learners in this study, discussed complex tasks did not produce statistically high amount of interactional features in terms of negotiation of meaning, confirmation check.

### 5.3.1.3 Comprehension Check

The third negotiation strategy of the NoM is comprehension check. It is an interactional expression created by the speaker to verify that his or her utterance made has been understood by others. For example, "Did you understand?" is commonly used phrase to check others' understanding of the utterance made.

This study examined the effects of the cognitive demands between simple and complex tasks on the NoM, in terms of comprehension check. The current study indicated that there was not a statistically significant difference of task complexity on the interactional feature, confirmation check in the dyadic peer interaction. However, task condition in terms of the triadic peer interaction yielded a statistically significant difference in producing the comprehension check, especially when discussing the simple task.

For peer interaction, as anticipated by the Cognition Hypothesis (Robinson, 2001, 2003, 2005, 2007), when learners discussed complex tasks, they produced higher amount of interactional features in terms of negotiation of meaning. In this study, the interactional feature found that had statistically significant different was the comprehension check,

especially when the number of participants increased in the peer interaction, which was during the triadic peer interaction.

Interestingly, in this study, the production of the interactional feature, comprehension check, showed that L2 learners checked others' comprehension of their preceding utterances more when discussing simple tasks during the peer interaction. These findings indicate that L2 learners paid more attention to others' understanding when dealing with simple tasks to check others had understood their own utterances pertaining to the subject matters. That is to say, learners cared less if others have understood their spoken ideas especially discussing the complex tasks.

### 5.3.2 Language-Related Episodes (LREs)

Swain and Lapkin (1998) who pays attention to the metalinguistic function of reflective role, Language-related Episodes (LREs) refer to the conversational turns that discuss morphosyntactic linguistic forms, such as vocabularies and sentence structure. LREs are the interactional features found in the discussion regarding the language they are producing, question their language use or correct themselves or others. The sub-categories of LREs are lexis-based, form-based, self-repairs and other-repairs. The self-repairs might occur during the hypothesis-testing stage or after the metalinguistic stage. In this study, other-repairs is labelled as recast whereas the self-repairs that occur after the metalinguistic stage is labeled as uptake of recast.

LREs are analyzed on the basis of their nature of language-related episodes (form-based or lexical-based) and on their outcome, such as correctly resolved, incorrectly resolved or unresolved and no recast at all.

### 5.3.2.1 Correctly Resolved Recast

As for the correctly resolved language-related episodes, the findings revealed that there was not statistically significant different in both dyadic and triadic peer interaction grouping in either simple or complex tasks.

The theoretical claim made by the Cognition Hypothesis (Robinson, 2001a, 2001b, 2003, 2005, 2007) is that the complex task can induce leaners to produce lengthier interaction; through interaction, learners might notice the mismatch between what they intend to convey and what they are not able to convey and thus divert their attention to notice the salient input from peers. Thus, this interactional phenomenon facilitates L2 learners to produce higher accuracy. However, in this case, the L2 learners in this study did not seem to statistically produce correctly-resolved LREs even when discussing complex tasks. The different number of participants in the peer interaction also did not seem to statistically produce correctly-resolved LREs.

The findings between correctly-resolved as well as partially or incorrectly resolved LREs showed that there was a trade-off effect between the production of the aforementioned LREs, in which is discussed in the following section.

### 5.3.2.2 Partially/ Incorrectly Resolved Recast

When it comes to the partially or incorrectly resolved language-related episodes, the finding revealed that L2 leaners produced statistically more of those partially or incorrectly resoled LREs when discussing the simple tasks during the dyadic peer interaction.

Thus, this interactional phenomenon facilitates L2 learners to produce higher accuracy. In this case, the L2 learners in the dyadic grouping in this study seemed to statistically produce an increase of partially or incorrectly-resolved LREs even when

discussing simple tasks. The different number of participants in the peer interaction also did not seem to statistically produce partially or incorrectly-resolved LREs.

Interestingly, when the interactional features, correctly-resolved as well as partially or incorrectly resolved LREs, it seems that there is a trade-off phenomenon between the two. The interactional journey in the dyadic grouping did provide the L2 learners the stage for noticing the mismatch between their intention of conveying the ideas and their incapability of communicating the ideas.

Thus, L2 learners rectified the communicative impasse, with their attempt to correct each other's' problematic utterances, however, the remedy provided by the L2 learners were either only partially correctly resolved or incorrectly resolved LREs. It also seemed that L2 learners seemed to attempt more partially or incorrectly resolved LREs when in pair in the simple task.

### 5.3.2.3 Unresolved Recast

Language-related episodes be it form-based or lexical-based that are unresolved were not statistically detected in the peer interaction. Unresolved language-related features, in this study is defined as a problematic language-related interactional phenomenon, for instance, the learner did not know a correct English word or sentence structure, in which his or her partner had noticed the existing problem, but remained unresolved. The findings revealed that the unresolved language-related episodes was not statistically significant regardless of the task complexity and task condition.

As claimed by the Cognition Hypothesis (Robinson, 2001a, 2001b, 2003, 2005, 2007, complex tasks induce leaners to produce lengthier interaction; through interaction, learners

could notice the mismatch between what they intend to convey and what they are not able to convey and thus divert their attention to notice the salient input from peers.

In this case, the L2 learners in this study did not seem to statistically produce unresolved LREs even when discussing complex tasks. As discussed in the preceding session, this could be due to the self-realization of the L2 learners noticing that there was a mismatch of the intention of conveying ideas and their capability to convey the ideas, and thus the production of partially or incorrectly resolved LREs was statistically produced in the dyadic grouping, at the expense of the unresolved LREs.

### 5.3.2.4 No recast

In the later peer interaction studies, recasts also refer to any corrective feedback or repairs, usually given by more knowledgeable other peers, not necessarily must be teachers. Recasts are the most common interactional features found in a conversation but also considered as the least effective way for noticing because it hardly leads to self-correction, one of the uptakes of recast features by learners. The phenomenon of no recast, in this study, is defined as no noticing taken place at the mismatch of the learners' intention of conveying the ideas and their incapability of conveying the ideas, and thus, there was no whatsoever repairs was given.

In this study, the finding indicated that task complexity and task condition did not show any statistically significant difference on the phenomenon of providing no recast. L2 learners seemed to notice and attempted to rectify the problematic language-related utterances and therefore the phenomenon of no recast was not statistically impacted in any task complexity and any grouping format of the peer interaction.

Overall, the findings revealed that task complexity and task condition played a role to condition learners to notice the mismatch and then attempt to rectify the language-related problematic utterance, especially when discussing a simple task, although the LREs provided were partially or incorrectly-resolved. It was also found that the phenomena of noticing and attempting to correct language-related problematic utterance were more conducive when they were conditioned in a dyadic grouping format. This phenomenon however did not explain the anticipation by the Cognition Hypothesis that cognitively more complex tasks heighten L2 learners' attention to notice the mismatch.

### 5.3.3 Uptakes of recast

Uptake and recast are inter-related phenomena in the language classroom. When learners have a wide range of responses at their disposal following the corrective feedback provided by other interlocutors, learners are considered to have internalized the knowledge to a certain extent. Recast, in the context of SLA refers to the phenomenon where the teacher repeats what the learner has produced, with corrective feedback but without any explanation and without obstructing the natural flow of communication (Lyster & Ranta, 1997).

Generally, there are variety ways of uptaking a recast, such as modified, unmodified, acknowledgment or no uptake at all. In this study, the finding revealed that only triadic grouping peer interaction produced statistically significant result, in terms of unmodified uptake of recast.

### 5.3.3.1 Modified Uptake of Recast

Although there was no statistically significant effect of task complexity and task condition on the modified uptake, the finding revealed that complex tasks yielded higher

number of modified uptake in both dyadic and triadic peer interactions. This suggested that complex tasks still triggered L2 learners to modify the corrective feedback provided by their peers to a certain extent.

### 5.3.3.2 Unmodified Uptake of Recast

Regarding the unmodified uptake of recast, the results suggested that complex tasks triggered L2 learners to produce a statistically significant result of the unmodified uptake of corrective feedback, especially when discussing the task in a triadic grouping. Due to that self-realization of the mismatch, they diverted their attention to the available salient immediate input from their peers, and thus uptook the input without any modification. This suggested that when there were more participants in discussing complex tasks, L2 leaners tended to just adopt the corrective feedback provided by their peer without any modification.

### 5.3.3.3 Acknowledgment

As for the acknowledgment phenomenon during the uptake of recast, the results suggested that there was no statistically significant effect of task complexity and task condition on acknowledging each other's feedback. However, the findings revealed that L2 learners acknowledged others' feedback more in simple tasks, especially in the dyadic grouping peer interaction. This finding might suggest that when L2 learners had noticed the recast that was provided by their peers, instead of just acknowledging their peer's feedback, they uptook the unmodified feedback in their interaction.

### 5.3.3.4 No Uptake

With regard to the no uptake phenomenon in the peer interaction, the results revealed that task complexity and task condition had no statistically significant difference as L2 learners seemed not to show no uptake of any corrective feedback provided by their peers in both simple and complex tasks of their dyadic and triadic peer interactions. The finding suggested that L2 learners uptook the unmodified recast more in the complex task if they noticed the recast had been provided by their peers, therefore, the phenomenon of no uptake of recast seemed to be not statistically significant in this case.

### 5.4 Summary

Overall, this chapter has presented the overall discussion for the first research question, that is, to what extent task complexity and task condition affected L2 individual writing, in terms of complexity, accuracy and fluency. The findings revealed that increasing the number of participants in the complex task discussion from individual to triad statistically increased the lexical and some dimensions of the syntactic complexities (MSTTR-50 and MLC) of L2 individual writing. As anticipated by the Cognition Hypothesis, this indicated that complex tasks stimulated participants' unlimited attentional resources that enable them to attend to multiple linguistic aspects and process the meaning for the content without trade-off effects (Robinson, 2001a, 2001b, 2003, 2005, 2007).

As for the facet of syntactic complexity, DCC, the findings indicated that there was a trade-off effect on the L2 individual writing when the number of participants is increased in the peer interaction. As for another dimension of the syntactic complexity, CPT, there was a trade-off effect on the L2 individual writing when there was an increased task complexity in

the prior peer interaction of the individual and triadic groupings. With regard to the grammatical accuracy, EFC, the findings supported the Cognition Hypothesis that more complex tasks yielded higher accuracy of the L2 individual writing. As for fluency and text length, the findings indicated that there was no statistically significant effect of task complexity and task condition on the L2 individual written fluency.

This chapter also has discussed the second research question, that is, to what extent task complexity and task condition affected peer interaction, in terms of NoM, LREs and Uptakes of recast.   The findings of the Negotiation of Meaning indicated that only comprehension check appeared to be statistically significant when L2 learners discussed complex tasks in a triadic grouping. L2 learners seemed to check with their peers more if others had understood their preceding utterances, especially when discussing complex tasks with more peers around.

As for the LREs, the findings indicated that L2 learners tended to partially resolve the morpho-syntactic linguistic forms, such as vocabularies and sentence structures or sometime, they incorrectly resolved the aforementioned linguistic features when discussing simple tasks, especially when there were more peers. As for the uptakes of recast, the findings indicated that only triadic grouping discussion yielded higher number of unmodified uptake of recast in the complex tasks.

The summary of the study, implications of the discussion and recommendation for further studies are presented in the last chapter, conclusion.

## CHAPTER 6: CONCLUSION

### 6.1 Introduction

This chapter provides a summary of the thesis and present an overview of the statistically significant findings of the study. It presents the scope of the study, the objectives of the study as well as the research design adopted for data collection and data analysis. Later, it presents the overall empirical findings that answered the two research questions. This chapter also argues the contributions of this study in the SLA and TBLT fields and it states some limitations of the study. In addition, it provides recommendations for future research. Finally, it argues the implications pertaining to the second language teaching and learning in the tertiary education in Malaysia.

### 6.2 Summary of the Study

#### 6.2.1 Scope of Study and Research Objectives

This study has investigated the effects of task complexity and task condition on L2 individual writing, in terms of lexical and syntactic complexities, grammatical accuracy and fluency (CAF). It also examined the effects of task complexity and task condition on the peer interaction, in terms of Negotiation of Meaning and its associated speech act features, language-related episodes and its associated types of languaging and uptakes of recast. A review of the present literature showed that the research on the task complexity and task condition on L2 writing and peer interaction is somehow lacking, in terms of its context, scope and meticulousness. The task features involved in this study were 2 task complexity manipulated with simple (2 causal reasoning demands) and complex (6 causal reasoning

demands) as well as 3 task conditions manipulated with individual, dyadic and triadic groupings. For L2 writing, individual session was set as baseline data, whereas dyadic and triadic groupings were set as treatment groups where peer interaction were allowed prior to their L2 individual writing. Findings of the individual session was then compared with the dyadic and triadic groupings' L2 individual writing. The research site was conducted at a private university in Malaysia.

The objectives of this study were as follows:

1. to investigate the effects of task complexity and task condition on L2 individual writing, in terms of lexical and syntactic complexities, grammatical accuracy and fluency, and

2. to investigate the effects of task complexity and task condition on the peer interaction, in terms of negotiation of meaning, and language-related episodes and uptake of recast.

### 6.2.2. Methodology

This study adopted a repeated measures ANOVA approach to collect and analyse the qualitative and quantitative data. The qualitative and quantitative data collected were triangulated with the comparison of two strands of analysis for a more rigorous examination of the effects of task features on the L2 individual writing and peer interaction. The qualitative analysis has explored not only the types of negotiation of meaning, language-related episodes and uptakes, but also identified the possible features of each type of peer interaction. The frequency of these qualitative data was then quantified for empirical findings of each type. As for the quantitative data concerning the effects of task complexity and task condition on the L2 individual writing in terms of CAF, having the dyadic and triadic

grouping of peer interaction prior to their L2 writing has enabled the researcher to understand in-depth of the role of peer interaction on the L2 writing. The findings also showed that to what extent that the different types of peer interaction facilitate the L2 written production. At the same time, the baseline data of the individual session of the L2 individual writing was also compared with the L2 individual writing in which peer interaction was allowed beforehand.

### 6.2.3 Research Questions

The following research questions were set to guide this study:

1. Is there a statistically significant effect of task complexity (simple vs complex task) and task condition (individual vs dyadic vs triadic grouping) on *lexical* and *syntactic Complexities*, *grammatical Accuracy* and *Fluency* in L2 individual writing?

2. Is there a statistically significant effect of task complexity on peer interaction in terms of Negotiation of Meaning, Language Related Episodes and Uptake on two task conditions (dyadic vs triadic grouping)?

### 6.2.4 Findings

#### 6.2.4.1 Findings for Research Question One

With regard to research question 1, the findings showed that the effects of task complexity and task condition on the multidimensional L2 written production partially supported the Cognition Hypothesis and it showed some trade-off effects on their multifaceted L2 writing. For L2 writing, there was a significant difference of lexical and

syntactic complexities when task complexity was manipulated with task condition. It showed that increasing task complexity from simple to complex statistically increased the lexical complexity, the mean segmental type-token ratio-50 (MSTTR-50), as anticipated by the Cognition Hypothesis. At the same time, increasing number of participants in complex tasks (from individual to triad) statistically increased the MSTTR-50. The baseline data, individual session showed that MSTTR-50 produced in the complex task is lower than the simple task. However, when the number of participants was increased for peer interaction, dyadic and triadic grouping for peer interaction for the complex task prior to the individual writing, it contributes to higher variety of lexis.

As for the multidimensional syntactic complexity, increasing task complexity from simple to complex in dyadic and triadic groupings statistically increased the syntactic complexity, the mean length of clause, as anticipated by the Cognition Hypothesis.

As for the dependent clause per clause, increasing task complexity from simpler to complex in the individual session statistically increased the dependent clause per clause on the individual L2 writing. However, when the number of participants was paired or grouped for peer interaction prior to the individual L2 writing, participants seemed to produce more dependent clauses in simple tasks as compared to complex tasks. It seems that there was a trade-off effect within the dimension of the syntactic complexity, between mean of length and dependent clause. As for the coordinate phrase per T-unit (CPT), increasing task complexity did not statistically increase the CPT but it only increased the CPT with dyadic grouping peer interaction prior to L2 individual writing. It seems that there was a trade-off effect on the increased task complexity in the individual and triadic groupings.

As for fluency, in terms of words per T-units (W/T), increasing task complexity did not increase the W/T of the L2 individual writing. However, task condition had a statistically

significant on the number of participants in the simple and complex tasks. It seems that the simpler individual and simple triadic groupings produced higher W/T in the individual L2 writing. However, simple dyadic grouping produced lower W/T as compared to complex dyadic grouping. These findings seem to also support the Cognition Hypothesis that task complexity only affects complexity, accuracy but not fluency. As for the text length, it seems that increasing task complexity increased the text length in the complex tasks when dyadic and triadic groupings were given the opportunities to interact with each other prior to their individual L2 writing. As for the baseline data, it seems that performing the complex task also caused the trade-off effects on the complex task that they produced shorter text length as compared to individual task.

These findings indicate that a pool of learners with multiple attentional resources could be triggered and contribute to more ideas in which it in turn increased the text length of their individual L2 writing. It also indicates that individual learners might need to have a peer to discuss and share the burden of giving ideas to the task. It seems that there is a trade-off effect if the learner has to perform a complex task alone.

### 6.2.4.2 Findings for Research Question Two

For research question 2, the findings obtained from the verbatim analysis and coding have showed that for peer interaction, as anticipated by the Cognition Hypothesis, when learners discussed complex tasks, they produced higher amount of interactional features in terms of negotiation of meaning, clarification requests and confirmation checks. Learners also produced more of those interactional features when the number of participants was increased. However, as for comprehension checks, it seems that learners checked each other comprehension more when discussing simple tasks regardless of the number of participants

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during the peer interaction. These findings indicate that learners paid more attention to self-understanding when dealing with complex tasks to clarify their own understanding of the subject matters discussed and to confirm their understanding of other's preceding utterance. That is to say, learners cared less if others have understood their spoken ideas especially in complex tasks.

Overall, the findings pertaining to the language-related episodes indicate that task complexity and task condition played an important role to condition learners to provide correctly-resolved language-related episodes to their peers especially when they were discussing task that are cognitively more complex. This might indicate that more attentional resources available produced higher number of correctly resolved interactional features that contributed to the language-related episodes. This phenomenon might explain the anticipation of the Cognition Hypothesis that cognitively more complex tasks enable learners to produce higher accuracy of the L2 production. This finding might suggest that when learners produced modified uptake in their interaction, they acknowledged less in their interaction.

In this study, an evident observation of the general differences between the spoken and written modalities of the L2 learners is that their L2 spoken form showed inaccurate and incomplete sentence structures whereas their L2 written form had complete sentence structures but some were grammatically inaccurate. These phenomena could be explained from different perspectives. Firstly, following the explanation by Ellis on the processing of the implicit and explicit knowledge, the L2 spoken form was far more ill-formed as compared to the L2 written form which could be due to the spontaneity of the application of the explicit knowledge. When writing in L2, sufficient time was provided to access the relevant declarative facts for L2 learners to edit or monitor their written production whereas the

explicit knowledge might be lacking in the spontaneous language use as L2 learners had to juggle the discussion for content and language usage within the stipulated time. Thus, there was a little opportunity for careful planning for language.

The second explanation that the L2 written form was generally composed with complete sentence structures and more accurate as compared to the L2 spoken form could be due to the practice of the automatisation of their explicit knowledge from the spoken form during the peer interaction. According to Ellis (2008), some learners automatize their explicit knowledge through practice. In this study, L2 learners might have practiced their explicit knowledge once during the peer interaction. Hence, they could access the declarative facts through a more rapid online processing in which they have become consciously aware of avoiding grammar violation when producing L2 writing.

Another evident phenomenon shown in the spoken form of the L2 learners is that they tend to switch to L1 code especially when encountering linguistically demanding situations. However, this L1 code-switching phenomenon was not observed at all in their L2 individual written production. The use of L1 code-switching during the peer interaction to discuss the linguistic issues they encountered could be due to their conscious awareness results from the explicit knowledge of what they are lacking in the target language. Thus, to seek assistance from peers and progress the interaction, L1 was used to solve the target language problem. Long (2015) explains that explicit learning results in explicit knowledge is when learners know something and they know that they know.

In other words, it might also indicate that the noticing of the lack of implicit knowledge directed learners to be consciously aware of the explicit knowledge on a particular linguistic feature provided during peer interaction. The use of L1 in L2 learners' discussions might serve as a reminder to themselves that they are lacking the L2 skills to express their

ideas. In this case, the L1 interactional process might facilitate L2 learners to modify their entrenched automatic L1 processing routines in their cognition, especially when salient L2 input is available from their peers. This interactional process might also establish form-meaning connection, in which will be held in short-term memory for a short period for it to be processed, rehearsed, and then stored in long-term memory (Long, 2015). For this reason, L2 learners might temporarily switch to selective attention to form and this process alters the way subsequent L2 input is processed implicitly.

Explicit learning is a conscious operation, which has learners to pay attention to aspects of a stimulus array to search for underlying patterns or structure. Although Long (2015) disagrees with the notion that explicit knowledge can become implicit through proceduralisation and automatisation. Rather, he views it as a trigger of a temporary switch to selective attention to form, for instance, when the communication breakdown occurs and immediate recast is provided, L2 learners focus on the immediate input.

## 6.3 Contributions of the Study

This study contributes to the second language acquisition (SLA) and task-based language teaching (TBLT) fields in three different facets. Theoretically, this study has provided insights into the operation of task complexity and task condition on L2 writing and peer interaction. The findings provided validation of the Cognition Hypothesis as well as revealed some trade-off effects as suggested by Skehan (1998) in which no studies had carried out before. The study also discussed the merged results from the cognitive-interaction perspectives in order to understand the relation of the interaction and the cognitive system of the L2 learners.

Methodologically, this study adopted a repeated measures mixed method research design to understand the micro changes of an individual with the manipulation of the task complexity in different task conditions. Although only 36 university students involved in this study, they were from nine different degree majors in which has showed some diverse samples of the population. To fill the research method gap as mentioned by Ellis (2015) about the scarcity of baseline data collection, the repeated measure research design employed in this study with the baseline data being collected intended to compare the baseline data with the dyadic and triadic peer interaction prior to their individual L2 writing. In the mixed-method study, the triangulation of the qualitative and quantitative data provided an in-depth understanding of how peer interaction triggers L2 learners' cognitive system and how the assimilation, accommodation and internalization manifested in L2 writing.

The comprehensive and meticulous research design for the investigation of the effects of task features on L2 writing and peer interaction help to fill the methodological limitations of previous studies in which between-group subjects were mostly employed. Therefore, this study is able to answer the research questions from cognitive-interaction perspectives, if there was any change in terms of automatisation and internalisation of an individual L2 learner performing tasks with different complexity in different task conditions. As for the data analysis, Norris and Ortega (2009) suggested that the global linguistic measures, CAF should be analyzed in a multidimensional manner. Therefore, this study also adopted the multifaceted conceptualization and operationalization of the measures of linguistic production. The results showed that certain task effects affected certain dimension of CAF differently.

Pedagogically, the findings of the study have showed that the variables presented in the Triadic Componential Framework are feasible to be operated in the real-life classroom,

as those variables are part of the daily teaching and learning elements. It is hoped that the method adopted in this study would be used for the SSARC model proposed by Robinson (2011) in which the task complexity levels are gradually increased from simple, intermediate to complex with repeated measure research design with different age group, proficiency and background of L2 learners. In the field of SLA and TBLT, this study has contributed with a more comprehensive findings on the effects of task complexity manipulated with -/+ causal reasoning demands and task condition manipulated with the number of participants, in which none had carried out before. Therefore, the results inform classroom practice in which teachers or practitioners can consider when adopting tasks as part of their teaching approach. After getting to know about their learners, the complexity levels of a task can be increased gradually from simple to complex, following the natural progressing principle in order to motivate learners to attempt the tasks.

As tasks are usually used as a platform for learners to communicate and learn through communication, teachers can consider arranging learners in different groupings with different number of participants. This is to encourage learners to communicate with each other in which according to the theory and results, it seems that communication of a task can stimulate learners to exchange information and at the same time, they would be able to notice the disequilibrium of the schema. With that, their attention resources would then be aware of the immediate input provided and any salient information being taken in will be assimilated and accommodated.

Through peer interaction, learners are able to show if the assimilation or automatisation takes place by analyzing their uptake of recast or the use of LREs. As for the internalization matters, the manifestation of the CAF in the L2 individual writing provide information to what extent peer interaction contributes to their writing.

**6.4 Limitations of the Study and Suggestions for Future Research**

There are a few limitations in this study. Firstly, the data collected were only from university students considering the typical classroom practice and implementation at the tertiary institutes in Malaysia, especially during the tutorial sessions, the operation of peer grouping for discussion in the class is common. A future study could be carried out on teenagers and children to examine if the effects of task complexity and task condition on their individual L2 writing and peer interaction are similar to this group of young adults'. Moreover, purposive sampling technique was employed during the participant recruitment, therefore, the low proficiency L2 learners were excluded from taking part in this study due to the preliminary data found in the pilot study that insufficient data was produced by them. In other words, the sampling technique used in this study is non-probabilistic and therefore, the results obtained from the statistical analyses might not be generalizable to the entire population of the tertiary level of students in Malaysia.

However, considering the demographic profile of the participants, such as their age, gender, background as well as the degree majors they have enrolled, it is justified that the current samples can be compatible with those of the tertiary students in other private universities in Malaysia. A future study could be carried out with some modification on the instrument, like adding some vignettes to prompt even the low proficiency students to discuss and write. As for the peer interaction analysis, in terms of the lexical- and form-based language-related episodes, future studies can further examine how task features affect each component differently as well as to what extent task complexity and task condition affect learners' interaction, lexical-based and form-based LREs differently. Instead of using argumentative-based topic as the nature of topic for the writing task, future researchers may consider a design with a narrative writing task in which it requires less cognitive effort in

reasoning. Research along these lines might be more attainable by a group of low proficiency learners.

Thirdly, due to the voluntary basis of the participant recruitment, time and logistic constraints, this study only focused on a group of university students in a private university in Malaysia. Future studies could be expanded to bigger scale of experiment, investigating university students from other 20 public universities and 47 private universities available in Malaysia. Therefore, the findings reported in this study can serve as a reference point for future research. In addition, this study was set as an experimental setting; future research could be conducted in a real-life classroom. However, the data collection of peer interaction recording might not be possible in a real-life classroom setting, therefore, future research could consider of collecting the learners' individual L2 writing.

Lastly, among the other variables available in the Triadic Componential Framework, this study only looked into the resource-directing task complexity, *causal reasoning demands* and the interaction factor, task condition, *the number of participants*. Future studies may investigate other individual or merged variables on two modalities, L2 written and spoken forms. Apart from that, the manipulation of the task complexity can be designed with different nature of tasks, such as narrative- or descriptive-based topic tasks. Research along this line may provide a more holistic picture of the interconnection between task complexity and task condition in different task types. This might also provide insights into whether or not the design of such a task plays a role in the learners' cognitive system; and to what extent it facilitates their language learning through peer interaction.

## 6.5 Pedagogical Implications and Recommendations

Second language researchers, educators, practitioners and syllabus designers concur that the complexity of a task can affect the cognitive system of the L2 learners in their L2 production (Robinson, 2003; 2005; 2007; Skehan 1998). The empirical findings of this study inform the practice of practitioners in task design as well as the implementation of task condition during the tutorial sessions in order to enhance the learning opportunities of L2 learners through peer interaction and with that it helps the L2 individual writing.

A comprehensive understanding of the task design in terms of its task complexity and task condition can be considered for task adjustment and modification to cater to the needs of the L2 learners about the effective ways to discuss, notice the gap, internalise and promote L2 learners' learning. The following subsections suggest some practical implications pertaining to L2 teaching and learning. For further investigation of the effects of task complexity and task condition on two modalities, spoken and written, future studies may look into the qualitatively and quantitatively analyzed written and spoken data. Future researchers may also use the data obtained from two modalities as the ancillary measures to investigate to what extent the spoken modality, the interactional features influence an individual written modality, in both simple and complex L2 individual writings.

## 6.5.1 Task Complexity and Task Condition on L2 Individual Writing and Peer Interaction

According to the Cognition Hypothesis (Robinson (2001a, 2001b, 2003, 2005, 2007), designing a task in a cognitively more complex manner can manipulate learners to develop access to their existing L2 knowledge base. In addition, cognitively more complex tasks also

promote greater syntacticisation and grammaticisation of the current interlanguage system. It is mentioned that since the cognitive system of learners and their interaction have a bidirectional relationship, that the cognitive system of learners can be triggered by the pedagogy task in which in turn stimulate their interaction, through the process of peer interaction, learners are able to develop their interlanguage system to produce higher accuracy and complexity of certain dimensions.

To understand if task complexity plays a role in affecting the quality of the interactional features of peer interaction, and if certain peer interactional features affect their accuracy and complexity in individual L2 writing, looking at linguistics measures manifested in their individual L2 writing provides a clearer picture of the relationship between peer interaction and their cognitive system. This is because writing in L2 after discussion requires L2 learners to process their schemata in the conscious mental state. For this reason, whether or not the internalization process takes place effectively after discussions with peers will be manifested from their individual L2 writing.

It is recommended for future research to trace under what kind of task complexity and task condition with different number of peer groupings would produce what types of interactional features that will stimulate the increase of certain dimension of accuracy and complexity. Moreover, future research might want to consider the design of task from the aspects of task complexity with different variables, as proposed in the Triadic Componential Framework. These variables may include *resource-directing* or *resource-dispersing* variables in order to examine the effects of a task on peer interactions. Future study can also examine the relationship between the two modalities affected by the combination of task complexity and task condition if they are parsimonious as suggested by the Cognition

Hypothesis in designing and sequencing the task, or there can be extravagant of the task design to enhance L2 production, acquisition and development.

Since noticing is also mentioned in the Cognition Hypothesis, future studies may look into to what extent the manipulation of variables stated in the Triadic Componential Framework could raise awareness of L2 learners in L2 acquisition. For example, how the explicit knowledge, like the interactional features such as language-related episodes that discuss the language use during the peer discussion enhance the cognitive system or interlanguage system that can eventually turn to implicit knowledge. If awareness or having L2 learners to notice the language usage during the peer interaction with the use of language-related episodes can serve as learners' explicit knowledge, will figuring it out quickly become their implicit knowledge in which they can apply in a real-time conversation?

It seems that the L2 learners used the LREs to discuss language or linguistics knowledge when completing their task, does it mean that the noticing of the language enhance the absorption of knowledge into the interlanguage system? Even if there is no clear result of the uptake of recast in their peer interaction, does that mean that no internalization occurs within their mental states? More future studies are required to carry out to look into the effects of task features on the peer interaction and L2 writing, from the cognitive-interaction perspectives, in a bidirectional manner.

In conclusion, as anticipated by the Cognition Hypothesis and Trade-off Effects, task complexity plays an important role in stimulating L2 learners' cognitive system for the gradated process of proceduralisation. Designing task with the natural progression principles from simple to complex facilitates L2 learners' automaticity for grammaticalisation and syntacticisation to a certain extent. Task condition also plays an important in setting a conducive learning environment for L2 learners to interact with each other. Investigating the

merged effects of task complexity and task condition on the L2 individual writing and peer interaction does not only benefit for language educators and syllabus designers, but it also provides insights into the language pedagogy and language classroom practicality.

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