LANGUAGE LEARNING THROUGH TASK-BASED SYNCHRONOUS COMPUTER-MEDIATED COMMUNICATION

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ABSTRACT

A limited number of studies have been conducted on the influence of task features on language production in computer-mediated communication (CMC) environments despite the role of tasks on the language production of L2 students who are mostly non-native speakers (NNSs). Among the prominent hypotheses on the relationship between tasks and language production are the Cognition Hypothesis and the Trade-Off Hypothesis. The current study examined the effect of task structure on student language production in terms of syntactic complexity and fluency in CMC

environments. A one-shot design study involved 46 NNS undergraduates in Malaysia and Japan. The respondents were divided into two groups: (1) respondents who performed the task with task structure (+TS) and (2) respondents who performed the task without task structure (-TS). The data were then analysed using a t-test. The present study supported the hypothesis positing that the utilisation of +TS contributes to an increase in syntactic complexity among NNSs, as well as the hypothesis proposing that the use of +TS results in improved fluency. The results also suggest examining additional variables related to task difficulty when designing tasks for CMC environments to assess their effects on fluency and syntactic complexity.

Keywords: CMC; fluency; syntactic complexity; TBLT; task structure

Introduction

Computer-mediated communication (CMC) has garnered considerable attention and recognition for its efficacy in facilitating language acquisition. This is particularly evident due to the COVID-19 pandemic, when individuals, including teachers and students, increasingly rely on various CMC platforms to maintain social connections and engage in leisure activities (Meier et al., 2021). As a result, prior studies on technologies in language education have been conducted on CMC due to its medium for students to benefit from the interaction.

There is a prevailing belief that tasks impact the process of eliciting particular language elements. According to Yongping (2022), tasks, more than just activities, are the foundation of classroom activities and tools for providing learners with challenging yet understandable language input. They provide opportunities for learners to interact and negotiate meaning, which is essential for effectively learning a new language. The importance of well-designed tasks in language learning and teaching provides a rationale for examining the connection between second language learning and task-based language learning and teaching (TBLT). TBLT is grounded in the notion that engaging students in authentic language use within the classroom can be achieved through task performance. Despite differences in the conceptualisation of TBLT among researchers, most agree that tasks promote the three dimensions of language acquisition: complexity, accuracy, and fluency (CAF). Even though research on technology and tasks has been actively conducted, particularly on the significance of task design and conditions in online settings on specific language features, there has been a demand for more empirical research. Hence, it is useful to discover the influence of tasks on the interlanguage system by investigating the effects of task structure on the dimensions of language acquisition of non-native speakers (NNSs).

Literature Review

Task-based Language Teaching (TBLT) and Computer-Mediated Communication (CMC)

Using CMC for second language learning could benefit NNSs, particularly when the design, use, and evaluation of CMC activities are guided by sound pedagogic rationales (Korvesi & Michel, 2022). This is because CMC supports the Interaction Hypothesis. The Interaction Hypothesis forms a foundational argument for conversational interaction in language teaching and learning, in which students have access to comprehensible input, outcomes, and corrections presented in conversations (Namaziandost & Nasri, 2019).

The use of CMC in educational settings provides NNSs with enhanced opportunities for interaction that extend beyond the confines of the traditional classroom. This encompasses the necessary possibilities for meaningful negotiation crucial for meaningful learning (Choo et al., 2014). For example, Yin and Satar (2020) investigated the impact of assessing the frequency and patterns of Negotiation for Meaning (NfM) in CMC interactions on enhancing foreign language learning. The study revealed that individuals with lower language proficiency levels experienced positive outcomes from engaging with educational agents. However, Yin and Satar also found that individuals with greater proficiency showed discontent. Behney and Gass (2021) also reveal that interaction may not immediately affect language development. These conflicting findings reflect the intricate and dynamic influence of technology on language development.

In a second language (L2) classroom with CMC, NNSs may engage in either synchronous (e.g., text chats, video conferencing) or asynchronous (e.g., email, discussion forums) modes of learning. The distinction between these modes can be categorised by the response time, presence, and resource types. Since the COVID-19 pandemic, synchronous learning has become even more embedded in L2 learning and teaching. Nevertheless, prior studies have identified multifaceted challenges during the switch to synchronous online language learning because of the pandemic. Zhang and Wu (2022) revealed four key difficulties Chinese university English as a Foreign Language (EFL) students face during synchronous online language learning: a lack of the traditional learning environment, the need for increased learner autonomy, changes in interaction patterns, and adaptation to remote assessment methods. These challenges create obstacles in understanding tasks, the most significant variable that determines the effectiveness of CMC activities (Smith & González-Lloret, 2021). Considering the positive outcomes of student interaction on CMC in the study by Belda-Medina (2021), the challenges could be due to digital material quality, pedagogical technology integration, and peer-to-peer interaction, not due to the nature of CMC.

A task is the key to constructing TBLT (Ellis, 2003). TBLT provides multiple inputs, production, and feedback (Lin et al., 2014) It includes experiential and goal-oriented learning that emphasises student engagement with real-world communicative tasks to produce comprehensible language output (Ortega, 2015). According to Leow (2015), language output is not merely a product but a learning process. While completing a task, multiple language acquisition processes occur (i.e., noticing the gap, hypothesis testing, and automatisation), which could be manifested

in the output. The process is also influenced by task repetition, planning time, and task complexity (Korvesi & Michel, 2022). Despite the role of tasks in CMC, a limited number of studies have been conducted on the influence of task structure on language production in CMC.

Task Complexity

Task complexity is a concept that is challenging to define. According to the structuralist point of view, task complexity is determined by the structure of a task as well as the requirements placed on a task, a product, or a creation to resemble human-task interaction (Liu & Li, 2012). Bayuk and Patrick (2021) include three dimensions of complexity to define complexity: component complexity, coordinative complexity, and dynamic complexity, and is structured in a way that requires high cognitive demands on the task performer.

Complexity, Accuracy, and Fluency (CAF)

Since the 1980s, complexity, accuracy, and fluency (CAF) have been identified as reliable measurements in language learning. The triad has predominantly become the dependent variable in most Second Language Acquisition (SLA) studies related to language production and language proficiency since the 1990s (Pallotti, 2020). Prior studies on task complexity provide significant and insignificant evidence of CAF in language production.

It has been discovered that manipulating variables in task complexity reduces syntactic complexity and increases lexical complexity (Frear & Bitchener, 2015). However, Cho (2018) found that task complexity only results in increased phrasal-level syntactic complexity, decreased accuracy, and unaffected fluency. In addition, studies on resource-dispersing variables, such as those by Khatib and Farahanynia (2020) and Shajeri and Izadpanah (2016), highlighted the nuanced interplay between task complexity, cognitive demands, and language output, with cognitive task complexity proportionate with the nature of task types. Even though Takahashi (2015) demonstrated that certain tasks posed a greater challenge to participants in terms of complexity and accuracy, influencing the overall quality of their performance, its relatively small sample size limited the ability to generalise the findings to a larger population.

Fluency, on the other hand, in studies on the +single task variable, as revealed by Shajeri and Izadpanah (2016), who discovered that complex task groups who were given scrambled order tasks performed significantly better, was significantly higher in groups that were given scrambled order tasks. In addition, fluency is also evident in Khatib and Farahanynia's (2020) study when a combination of strategic planning and task repetition results in a higher speech rate in a task with higher complexity. In addition, Staples et al. (2016) reveal a significant relationship between academic level and the use of phrasal complexity features in writing. However, the use of clausal

complexity features in student writing, particularly finite dependent clauses, decreases as the academic level increases.

Task Complexity and Cognition Hypothesis

Robinson (2001) states that the complexity of a task is determined by the structure of the task, including attentional, memory, reasoning, and information. Task complexity, which is introduced in the Cognition Hypothesis (CH), uses CAF to measure the representation and restructuring of interlanguage development (accuracy and complexity) as well as control and automatisation of L2 knowledge (fluency). The hypothesis is generally used to make predictions about the cognitive operations and attentional resources affecting L2 development, though Robinson's CH takes an alternative view that students possess multiple attentional resources. CH distinguishes between resource-directing dimensions of task complexity, in which the cognitive demands of tasks direct attention to aspects of the second language that can be used to perform them, and resource-dispersing dimensions of task complexity, which increase attentional and other cognitive demands without directing attentional or memory resources to any aspects of language that can be used to accomplish the task (Robinson, 2010).

   CAF are three common measures in language and linguistic literature. According to Abdi Tabari and Miller (2021), as CAF elements belong to different attentional resources, complexity, and accuracy can be attended to concurrently with possible declines in fluency. Robinson (2010) later augmented CH with the Triadic Componential Framework (TCF), renamed the Stabilise, Simplify, Automatise, Reconstruct and Complexify (SSARC) Model. Several variables have been tested in TCF to identify their effects on students' complexity, accuracy, and fluency in language performance. They are task complexity, task condition, and task difficulty.

   Task complexity refers to the level of difficulty associated with the completion of a given task. Multiple factors are involved. The resource-direction variables determine the mental effort required. When a task necessitates the management of multiple elements, its complexity increases due to the requirement of simultaneously monitoring numerous variables. Moreover, certain tasks necessitate comprehending or anticipating others' intentions, rendering them more straightforward or complex. Likewise, tasks that entail the process of reasoning about cause-and-effect relationships exhibit a range of complexities. In contrast, the resource-dispersing variables encompass elements such as the structural characteristics of the task, the amount of time allocated for planning, and the individual's existing knowledge. Tasks with a well-defined structure tend to exhibit reduced complexity, as the individual executing the task clearly understands the sequential steps needed. The presence of a sufficient amount of time for planning can lead to a reduction in complexity, whereas a scarcity of time can exacerbate the difficulty of tasks. Additionally, prior knowledge can facilitate the completion of tasks by allowing individuals to leverage their existing knowledge as a foundation for further learning and problem-solving.

The concept of task condition pertains to the specific context in which a task is executed and its impact on the dynamics of interactions. It incorporates two fundamental components. When making interactional demands, assessing whether the task at hand has an open-ended solution, involves a limited number of respondents, or necessitates negotiation is important. Open-ended tasks frequently require participants to engage in more extensive discussions, augmenting complexity. A limited number of participants possess the ability to simplify interactions, whereas the inclusion of negotiation requirements can contribute to the heightened intricacy. The respondent variables making interactional demands; however, pertain to the attributes and traits of the individuals engaged in the interaction. The performance of tasks can be influenced by factors such as the similarity of participants' proficiency levels, their gender composition, and their shared cultural background. For instance, when individuals possess comparable proficiency levels, interactions could be streamlined, and complexity could be diminished.

On the other hand, task difficulty associated with a task is influenced by many factors contributing to its perceived challenge. There exist two principal categories to be taken into consideration. Firstly, the concept of ability variables and task-relevant resource allocation will be discussed. Differential factors encompass various cognitive abilities, including working memory capacity, task-switching skills, and reasoning abilities. Individuals with a high working memory capacity possess an enhanced ability to manage intricate tasks effectively. Conversely, individuals who exhibit proficiency in task-switching demonstrate a streamlined capacity to seamlessly transition between various components of a given task. Secondly, the impact of affective variables and task-relevant states on individuals' performance. Trait differential refers to the examination and analysis of emotional and motivational aspects. The willingness for communication, motivation, and self-efficacy have significant roles. The willingness to communicate can alleviate the challenges associated with interactive situations, while a high level of motivation can enhance engagement and mitigate the perception of tasks as overwhelming. The perception of task difficulty can be influenced by an individual's level of self-efficacy, which is a measure of confidence.

In brief, task complexity, task condition, and task difficulty are intricate constructs subject to diverse factors' influence. These factors encompass the inherent nature of the task, the attributes of the individuals involved, and the unique interplay of individual abilities and emotions. Gaining an understanding of these factors can facilitate individuals and organisations in effectively managing and enhancing the execution of tasks and interactions. Robinson (2001) proposes that complex tasks along the resource-directing dimension push greater development of complexity and accuracy, while fluency has less impact on language production. On the other hand, language accuracy and complexity are expected to decrease when the task is made complex along the resource-dispersing dimension. In accordance with that, a great deal of focus has been devoted to examining the effects of task complexity on the language production of L2 students. However, findings vary.

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Task Complexity and Trade-off Hypothesis

The Trade-off Hypothesis by Skehan (2009) predicts a trade-off effect on attentional resources and ongoing processes during task performance (CAF) that results in the prioritisation of one (or two) areas due to the limitation of capacity. Thus, allocating attentional resources may negatively affect the performance of CAF, which requires attention and working memory (Skehan, 2009). According to Skehan, studies have been offering generalisations that support the Trade-Off Hypothesis, such as (1) tasks based on concrete or familiar information advantage accuracy and fluency; (2 tasks containing clear structure advantage accuracy and fluency; (3) interactive tasks advantage accuracy and complexity; (4) tasks requiring information manipulation lead to higher complexity; and (5) post-task conditions such as public performance or transcription of one's own performance raise accuracy.

Task Complexity and CMC

Differences in the medium of language output yield divergent outcomes, implying that outcomes of comparable studies under different task conditions may also differ. Most previous studies on task complexity have been conducted in real-time communication. As the findings of the studies could only be relevant to a similar mode of communication, studies on the influence of task structure on CAF in different modes of communication are on the rise, including those conducted in a CMC environment. Even so, CMC and real-time communications share many of the characteristics of spoken dialogues.

To conclude, the effects of task complexity on student language production have produced mixed results. However, a few variables are studied considerably less specifically in relation to the performance of tasks in CMC. As a result, the present study aimed to investigate the variable that has received less attention from researchers, specifically task structure, which is a resource-distributing variable, to examine its full potential in L2 learning and teaching in an online context.

The main motivation of this study was to investigate the effects of task structure on the language performance of NNS with regard to syntactic complexity and fluency in synchronous CMC environments. Accordingly, the current study examines two research questions as follows:

1. How does the task structure affect the language performance of NNSs in terms of syntactic complexity in synchronous CMC?
2. How does the task structure affect the language performance of NNSs in terms of fluency in synchronous CMC?

This leads to the formation of the following hypotheses:

H_{0a}: There is no relationship between task structure and the performance of syntactic complexity of NNSs in synchronous CMC.

H_{1a}: There is a relationship between task structure and the performance of syntactic complexity of NNSs in synchronous CMC.

H_{0b}: There is no relationship between task structure and the fluency of NNSs in synchronous CMC.

H_{1b}: There is a relationship between task structure and the fluency of NNSs in synchronous CMC.

Methodology

This study used a mixed-method approach to ensure a thorough and well-rounded investigation.

The respondents were 46 non-native speakers (18 males, 28 females) of Japanese and Malaysian nationality, aged 22 to 25. All respondents were undergraduates who had completed at least one year of formal English language study at the postsecondary level and had completed formal English language learning in elementary and secondary schools. The respondents' ability to understand, produce, and participate in English communication was used to determine their proficiency level. The respondents were determined to be at an intermediate level of English proficiency based on their ability to comprehend phrases and sentences written and spoken in English, as well as read and produce complex sentences and verbally exchange information on topics that were already familiar to them. They were grouped as having a proficiency level between B1 and high B2 levels according to the Common European Framework of Reference for Languages (CEFR).

The current study employed a one-shot experimental design with two task implementation factors designed for the respondents, namely: (1) tasks without task structure (-TS) and (2) tasks with task structure (+TS).

The respondents of the current study were divided into two groups: (1) respondents who were provided with +TS and (2) respondents who were provided with -TS. Each group experienced four sessions via Zoom, that is, icebreaker session, discussion session, presentation session, and semi-structured interview. The instructions were sent to the +TS and -TS groups via email 15 minutes before the start of the first session. All information for the sessions was shared through Google Drive. This allowed respondents to interact synchronously with one another to produce slides.

The respondents from both countries met up virtually in the first session, the ice-breaking session. During the session, they took turns introducing themselves to one another. They exchanged information on topics such as movies, actors or singers, cartoon characters, and hobbies. They also shared information about what they had in common. The respondents left this session feeling comfortable with one another, which was the intended outcome. The second session, the discussion session, took place immediately after the ice-breaking session. During the discussion, respondents were required to discuss in groups the benefits and drawbacks of online learning in the context of the COVID-19 pandemic. The respondents in the +TS group were given

instructions that guided the discussion points while completing the task. On the other hand, the respondents in the -TS group were given basic instructions to complete the task without guidance to conduct the group discussion. They were expected to freely interact with one another to reach the goal of the task.

Then, the respondents produced presentation slides that lasted between seven and 10 minutes. A presentation rubric was also provided to the students so they would be aware of the expected performance criteria and standards. The analysis of the current study included the interaction and the language output produced by the respondents during the sessions. The final session, the semi-structured interview, was administered for a period of between 15 and 20 minutes for each group. The meeting was held online through Google Meet. Its primary objective was to collect additional data on phenomena that cannot be directly observed, such as the students' self-reported perceptions or attitudes (Mackey & Gass, 2005). The interview questions were also provided to the respondents 30 minutes before the interview started to allow them time to prepare better. During the interview, probing questions were posed when necessary to support the main data.

Results

According to Ellis (2003), the number of words per an analysis of speech unit (AS-unit) is the metric that is used to evaluate syntactic complexity, while the number of words per minute is the metric that is utilised to evaluate fluency. This product-based measure has been employed in many related studies. It was selected in the current study for two reasons. First, it has ecological validity that can be used in curriculum-based assessment, and second, it allows the results of the study to be compared with the findings of previous studies (Abdi Tabari & Miller, 2021).

The results for the impact of +TS, from the t-test, on the respondents' syntactic complexity and fluency of language production are summarised in Table 1. With the availability of task structure (+TS), the respondents managed to produce a minimum of two (2) AS-units (Respondent E and Respondent F) and a maximum of five (5) AS-units (Respondent B and Respondent C). The mean for syntactic complexity of the +TS group was 3.6. In terms of fluency, Respondent D achieved the highest number of words per minute (34 words per minute), while Respondent E and Respondent F scored 0 words per minute.

Table 1
Levels of Syntactic Complexity and Fluency (+TS Group)

Task Structure	Respondent	Syntactic Complexity	Fluency
+TS	A	4	22
+TS	B	5	18
+TS	C	5	28
+TS	D	4	34

+TS	E	2	0
+TS	F	2	0

The results for the impact of -TS, from the t-test, on the respondents' syntactic complexity and fluency of language production are summarised in Table 2. Without th(2) e task structure (-TS), the respondents managed to produce a minimum of two AS-unit (Respondent I) and a maximum of four AS-unit (Respondent G, Respondent J, Respondent K, and Respondent L). The mean for syntactic complexity of the -TS group was 3.5. In terms of fluency, Respondent K achieved the highest number of words per minute (31 words per minute), while Respondent I scored two (2) words per minute.

Table 2

Levels of Syntactic Complexity and Fluency (-TS Group)

Task Structure	Respondent	Syntactic Complexity	Fluency
-TS	G	4	19
-TS	H	3	10
-TS	I	2	2
-TS	J	4	29
-TS	K	4	31
-TS	L	4	20

Following analysis of the data presented in Table 1 and Table 2, several observations were made regarding task structure's impact on syntactic complexity and fluency. The mean score for syntactic complexity was 3.6 for the respondents in the +TS group, while the respondents in the -TS group had a mean score of 3.5. Furthermore, it was observed that Respondent B and Respondent C belonging to the +TS group, showed the maximum AS-unit score of 5, while the highest AS-unit score recorded among respondents from the -TS group was 4. The results suggest that the respondents from the +TS group showed a greater number and mean of AS-unit, despite the marginal difference between the two groups. This suggests that task structure has a favourable impact on syntactic complexity. With respect to fluency, Respondent D from the +TS group attained the highest number of words per minute (34 words per minute), while Respondent K from the -TS group achieved the highest number of words per minute (31 words per minute). This implies the positive influence of task structure on fluency.

Table 3 summarises the findings on the influence of task complexity on syntactic complexity and fluency discovered in the current study. The data were analysed using a t-test in Statistical Package for the Social Sciences (SPSS) version 27. The goal was to determine whether or not there was a significant difference between the +TS and -TS groups. In the analysis, a *p*-value of 0.05 was chosen as the threshold.

Table 3

The p-value for Syntactic Complexity and Fluency

Hypothesis	*p*-value	Significance level
$H1_a$	0.46	0.05
$H1_b$	0.75	0.05

According to Table 3, the *p*-value for syntactic complexity (H_a) was 0.46. On the other hand, the *p*-value for fluency (H_b) was 0.75. This indicates that task structure had a higher influence on fluency than on the syntactic complexity of NNSs.

Another collection method of the current study was a semi-structured interview. Based on the interview, the respondents from the +TS group perceived task structure as allowing careful consideration of the aspects that should be incorporated.

At first, it looks like an easy topic (task), but when we start reading the questions on what to include in the presentation, we took some time to think of our points. (Respondent A, +TS)

According to Respondent A (+TS), task structure allows access to cognitive processing. Access to cognitive processing allows NNSs to have a better ability to analyse and generate intricate syntactic structures. For example, there was a positive impact of task structure on syntactic complexity. The following depictions are excerpts derived from the respondents. Respondent B and Respondent D belonged to the +TS group.

I think it affects in terms of travelling with my family, or the people near me in terms of economy and financial, I think.' (Respondent B, +TS)
'My brother first, second, third, and fourth were all far from home, so during the COVID-19 pandemic, they had difficulties travelling. *(*Respondent D, +TS)

The extracted keywords from Respondent B's and Respondent D's written responses demonstrated their attention to the specific aspects of the topic outlined in the task guide (+TS). These keywords included terms related to travel, economics, finance, and ordinal numbers such as first, second, third, and fourth. This indicated that though the respondents were attentive to the given task, they could produce synthetically complex sentences. Despite NNSs having to concentrate on the task's content and structure, they still paid attention to the language mechanics. To illustrate, there was an observable increase in the syntactic complexity of the language produced by NNSs in the +TS group. This finding implies that a greater cognitive load from task structure positively influences syntactic complexity.

In contrast, the samples obtained from Respondent H and Respondent J demonstrated that language production with greater syntactic complexity was observed in less cognitively complex tasks involving resource-dispersing variables (-TS). This enabled NNSs to allocate more attention to the writing systems and/or processes than the translating process. Accordingly, the result of the interview

demonstrated that tasks with lower cognitive complexity along the resource-dispersing variable (-TS) led to more syntactically complex language production.

> The bad point is that when we learn and have online learning classes, sometimes we have difficulties understanding, and it's really hard for us to meet the lecturer. (Respondent H, -TS)
> So, do you agree to move on to online classes even after the COVID-19 pandemic or just during the pandemic? (Respondent J, -TS)

Hypothesis 1b stated that task structure encouraged NNSs to achieve greater fluency but was not sufficiently supported in terms of fluency. According to the interview, Respondent D, who was in the group with task structure (+TS), scored the highest level of fluency because task structure provided pre-made chunks and useful prompts for interactions.

Discussion

Guided by the Cognition Hypothesis, the Trade-off Hypothesis, task structure, and CAF, this study investigated the influence of task structure on fluency and syntactic complexity in a CMC environment. NNSs of English attempted the developed tasks set in the environment. The task complexity varied depending on the task structure. The variable was represented by +TS and -TS symbols, with +TS denoting a task with structure and -TS without structure.

Two hypotheses were tested. Hypothesis 1a posited a correlation between the task structure and the syntactic complexity of NNSs in synchronous CMC which was studied through the number of words per an analysis of speech unit (AS-unit). Meanwhile, Hypothesis 1b dictated a correlation between task structure and the fluency of NNSs in synchronous CMC, which was studied through the number of words per minute.

A synchronous CMC environment generally allows for interaction between NNSs of different nationalities. Due to the respondents' similar proficiency levels, the data during the icebreaker, discussion, and presentation sessions could be collected. During the interactions, there is evidence of meaningful negotiation through the respondents' use of the two types of conversational modifications (i.e., communication strategies and speech modifications) outlined by Wagner (1996). Therefore, the current study concludes that interactions can occur with or without task structures in a synchronous CMC environment. However, the current study concludes that NNSs receiving task structures can produce more words per AS unit and minute, suggesting a positive relationship between task structure and syntactic complexity and fluency. This conclusion is in accordance with interactionist research findings, which have recognised the influence of tasks in advancing the development of syntactic complexity (Mancilla et al., 2017) and fluency (Cheon, 2003) among NNSs.

The current study provides sufficient evidence to support the relationship between task structure and the performance of syntactic complexity of NNSs in

synchronous CMC. Tasks with structure (+TS) encourage NNSs to produce words with greater syntactic complexity. The findings of the current study, obtained from the online interaction and interview, provide evidence in favour of one theoretical claim of the Cognition Hypothesis, which is that the increased cognitive demands of tasks contribute to increased complexity along certain dimensions, thereby pushing students to greater accuracy and complexity of L2 production to meet the greater functional and conceptual communicative demands they place on the student (Robinson & Gilabert, 2007).

In addition, the current study provides sufficient evidence to support the relationship between task structure and the fluency of NNSs in synchronous CMC. This indicates that tasks with task structure (+TS) prompt NNSs to produce more words to represent their language fluency. This is aligned with the Cognition Hypothesis that the increasing resource-directing variables positively influence fluency (Robinson, 2001). Therefore, the claim that the increased load of task structure results in less fluency among NNSs is rejected. The present findings concur with Jackson and Suethanapornkul (2013), who concluded the negative effect of increasing task demands on fluency, and also with Tavakoli and Foster (2011), who found that simple tasks reduced the cognitive processing load, hence allowing for more attention to be dedicated to fluency.

While Skehan's Trade-off Hypothesis posits that individuals, including NNSs, possess a finite capacity for attention (Choong, 2011), the current study's heightened cognitive demand for pedagogical tasks benefits NNSs. This is because the heightened cognitive demand of pedagogical tasks requires access to familiar solutions to tasks (known as cognitive familiarity) and the division of solutions to new problems (known as cognitive processing), which can potentially improve syntactic complexity and fluency. Combining cognitive familiarity and cognitive processing allows NNSs to leverage their existing knowledge by expanding their sentence structure repertoire and applying it appropriately in different contexts as structured in the task. The findings of the current study are also against the claim made by Johnson (2017) that a reduction in resource-dispersing sources of task complexity can alleviate the components of working memory, enabling allocating more attention to the language outputs. The findings also reject the conclusion by Kellogg (1996) and Kellogg et al. (2013) that task structure promoted attention to the formulation and monitoring systems of the writing but comparatively reduced attention to the language production process. In short, as NNSs focus on the task structure to direct CMC interaction, they are attentive to adhering to the task as well as producing more words and words of complex language forms.

Even so, there were outliers in the data of the current study. Respondent E and Respondent F produced the lowest number of words per AS-unit (2) and per minute (0) despite being given tasks with task structure. This could be before output anxiety. Previous studies have examined the impact of task structure on CAF by utilising the input, processing, and output anxiety scale (IPOAS) that was used to evaluate the extent of respondents' anxiety to produce L2 input (Robinson, 2007) successfully. The omission of the use of IPOAS in the current study raises concerns

about the level of anxiety of the respondents, even though anxiety has been shown to have a detrimental effect on general and specific task performance measures, as well as on the four core language skills (Trebits, 2016). Therefore, the exclusion of IPOAS warrants further consideration in future research.

The unavailability of the use of IPOAS put the level of anxiety of respondents of the current study in the dark, even though anxiety harms both general and specific task performance measures and concerns the four core language skills (Trebits, 2016). The unavailability of IPOAS has left the respondents in a state of uncertainty regarding their anxiety levels.

Conclusion

The fundamental objective of TBLT is centred on the utilisation of language to accomplish practical and authentic tasks. Various academic studies have indicated that task performance in synchronous CMC presents a viable opportunity for a significant interaction. Nevertheless, the identification of appropriate learning tasks for NNSs can prove to be a difficult undertaking. Therefore, it is imperative to prioritise the awareness of NNSs towards their language production.

The utilisation of task structure is a noteworthy mechanism for reducing cognitive complexity in acquiring a language. Compared to face-to-face communication, the reduced presence of paralinguistic cues in CMC allows for observing significant language interactions. The current study examined the claim in the Cognition Hypothesis that task complexity increases syntactic complexity and lowers fluency. It is discovered that increased task complexity via increased task demand (task structure) negatively impacts language output in terms of syntactic complexity and fluency in the context of the current study.

The current research has discovered that tasks, specifically task structure, negatively impact syntactic complexity and fluency. Future research endeavours may explore additional task complexity variables that could impact the fluency of NNSs' language performance, such as their willingness to communicate (WTC). Also, Staples et al. (2016) posit that the academic task genre, specifically argumentative versus comparative writing, may impact the metrics of syntactic complexity utilised in L2 writing. The statement can be associated with intricate elements inherent in scholarly compositions. Henceforth, it is recommended that future research opt for a specific task genre.

Acknowledgement

References

Abdi Tabari, M., & Miller, M. (2021). Unraveling the effects of task sequencing on the syntactic complexity, accuracy, lexical complexity, and fluency of L2 written production. *Canadian Journal of Applied Linguistics*, *24*(2), 1-29. https://doi.org/10.37213/cjal.2021.31306

Bayuk, J. B., & Patrick, V. M. (2021). Is the uphill road the one more taken? How task complexity prompts action on non-pressing tasks. *Journal of Business Research, 128*, 436-449.https://doi.org/10.1016/j.jbusres.2021.02.012

Behney, J., & Gass, S. (2021). *Interaction*. Cambridge University Press.

Belda-Medina, J. (2021). Enhancing multimodal interaction and communicative competence through task-based language teaching (TBLT) in synchronous computer-mediated communication (SCMC). *Education Sciences, 11*(11), 1-17. https://doi.org/10.3390/educsci11110723

Cheon, H. (2003). The viability of computer-mediated communication in the Korean secondary EFL classroom. *Asian EFL Journal, 5*(1), 1-61.

Cho, M. (2018). Task complexity, modality, and working memory in L2 task performance. *System*, *72*, 85-98. https://doi.org/10.1016/j.system.2017.10.010

Choo, L. P., Kaur, G., Fook, C. Y., & Yong, T. C. (2014). Patterns of interaction among ESL students during online collaboration. *Procedia - Social and Behavioral Sciences, 123*, 307-314. https://doi.org/10.1016/j.sbspro.2014.01.1428

Choong, K. W. P. (2014). *Effects of task complexity on written production in L2 English* [Doctoral dissertation, Columbia University]. Semantic Scholar. https://www.tc.columbia.edu/i/a/document/33986_BROWN_BAG_LECTURES _Phil_Choong.pdf

Ellis, R. (2003). Designing a task-based syllabus. *RELC Journal, 34*(1), 64-81. https://doi.org/10.1177/003368820303400105

Frear, M. W., & Bitchener, J. (2015). The effects of cognitive task complexity on writing complexity. *Journal of Second Language Writing, 30*, 45-57. http://dx.doi.org/10.1016/j.jslw.2015.08.009

Jackson, D. O., & Suethanapornkul, S. (2013). The cognition hypothesis: A synthesis and meta-analysis of research on second language task complexity. *Language Learning, 63*(2), 330-367. https://doi.org/10.1111/lang.12008

Johnson, M. D. (2017). Cognitive task complexity and L2 written syntactic complexity, lexical complexity, and fluency: A research synthesis and meta-analysis. *Journal of Second Language Writing, 37*, 13-38. https://doi.org/10.1016/j.jslw.2017.06.001

Kellogg, R. T. (1996). A model of working memory in writing. In C. M. Levy & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences and applications* (pp. 57-71). Erlbaum.

Kellogg, R. T., Whiteford, A. P., Turner, C. E., Cahill, M., & Mertens, A. (2013). Working memory in written composition: A progress report. *Journal of Writing Research, 5*(2), 159-190. https://doi.org/10.17239/jowr-2013.05.02.1

Khatib, M., & Farahanynia, M. (2020). Planning conditions (strategic planning, task repetition, and joint planning), cognitive task complexity, and task type: Effects on L2 oral performance. *System, 93*, 1-12. https://doi.org/10.1016/j.system.2020.102297

Korvesi, E., & Michel, M. (2022). Chatting with your peers across modalities: Effects of performing increasingly complex written computer-mediated tasks on oral L2 development. *Languages, 7*(4), 1-22. https://doi.org/10.3390/languages704027

Leow, R. P. (2015). *Explicit learning in the L2 classroom: A student-centered approach*. Routledge.

Lin, T. J., Wang, S. Y., Grant, S., Chien, C. L., & Lan, Y. J. (2014). Task-based teaching approaches of Chinese as a foreign language in second life through teachers' perspectives. *Procedia Technology*, *13*, 16-22. http://dx.doi.org/10.1016/j.protcy.2014.02.004

Liu, P., & Li, Z. (2012). Task complexity: A review and conceptualization framework. *International Journal of Industrial Ergonomics, 42*(6), 553-568.

Mackey, A., & Gass, S. M. (2005). *Second language research: Methodology and design*. Routledge.

Mancilla, R. L., Polat, N., & Akcay, A. O. (2017). An investigation of native and nonnative English speakers' levels of written syntactic complexity in asynchronous online discussions. *Applied Linguistics, 38*(1), 112-134. https://doi.org/10.1093/applin/amv012

Meier, J. V., Noel, J. A., & Kaspar, K. (2021). Alone together: Computer-mediated communication in leisure time during and after the COVID-19 pandemic. *Frontiers in Psychology, 12*, 1-13. https://doi.org/10.3389/fpsyg.2021.666655

Namaziandost, E., & Nasri, M. (2019). A meticulous look at Long's (1981) interaction hypothesis: Does it have any effect on speaking skills. *Journal of Applied Linguistics and Language Research, 6*(2), 218-230.

Ortega, L. (2015). Researching CLIL and TBLT interfaces. *System, 54*, 103-109. https://doi.org/10.1016/J.SYSTEM.2015.09.002

Pallotti, G. (2020). Measuring complexity, accuracy, and fluency (CAF). In P. Winke & T. Brunfaut (Eds.), *The Routledge handbook of second language acquisition and language testing* (pp. 201-210). Routledge.

Robinson, P. (2001). Task complexity, task difficulty, and task production: Exploring interactions in a componential framework. *Applied Linguistics, 22*(1), 27-57. https://doi.org/10.1093/applin/22.1.27

Robinson, P. (2007). Task complexity, theory of mind, and intentional reasoning: Effects on L2 speech production, interaction, uptake and perceptions of task difficulty. *International Review of Applied Linguistics in Language Teaching*, *45*, 237-257. http://dx.doi.org/10.1515/iral.2007.009

Robinson, P. (2010). Situating and distributing cognition across task demands: The SSARC model of pedagogic task sequencing. In M. Pütz & L. Sicola (Eds.), *Cognitive processing in second language acquisition: Inside the student's mind* (pp. 243-268). John Benjamins.

Robinson, P., & Gilabert, R. (2007). Task complexity, the cognition hypothesis and second language learning and performance. *International Review of Applied Linguistics in Language Teaching, 45*(3), 161-176. http://dx.doi.org/10.1515/IRAL.2007.007

Shajeri, E., & Izadpanah, S. (2016). The impact of task complexity along single task dimension on Iranian EFL students' writing production. *Theory and Practice in Language Studies, 6*(5), 935-945. http://dx.doi.org/10.17507/tpls.0605.04

Skehan, P. (2009). Modelling second language performance: Integrating complexity, accuracy, fluency, and lexis. *Applied Linguistics, 30*(4), 510-532. https://doi.org/10.1093/applin/amp047

Smith, B., & González-Lloret, M. (2021). Technology-mediated task-based language teaching: A research agenda. *Language Teaching, 54*(4), 518-534. https://doi.org/10.1017/S0261444820000233

Staples, S., Egbert, J., Biber, D., & Gray, B. (2016). Academic writing development at the university level: Phrasal and clausal complexity across level of study, discipline, and genre. *Written Communication, 33*(2), 149-–183. https://doi.org/10.1177/0741088316631527

Takahashi, S. (2015). The effects of student profiles on pragmalinguistic awareness and learning. *System, 48*, 48–61. https://doi.org/10.1016/j.system.2014.09.004

Tavakoli, P., & Foster, P. (2011). Task design and second language performance: The effect of narrative type on student output. *Language Learning, 61*, 37-72. https://doi.org/10.1111/j.1467-9922.2011.00642.x

Trebits, A. (2016). Sources of individual differences in L2 narrative production: The contribution of input, processing, and output anxiety. *Applied Linguistics, 37*(2), 155-174. https://doi.org/10.1093/applin/amu006

Wagner, J. (1996). Foreign language acquisition through interaction: A critical review of research on conversational adjustments. *Journal of Pragmatics, 26*(2), 215-235. https://doi.org/10.1016/0378-2166(96)00013-6

Yin, Q., & Satar, M. (2020). English as a foreign language learner interactions with chatbots: Negotiation for meaning. *International Online Journal of Education and Teaching, 7*(2), 390-410.

Yongping, D. E. N. G. (2022). Exploration and practice on task-based language teaching theory in college English teaching. *Sino-US English Teaching, 19*(3), 88-93. https://doi:10.17265/1539-8072/2022.03.002

Zhang, K., & Wu, H. (2022). Synchronous online learning during COVID-19: Chinese university EFL students' perspectives. *SAGE Open, 12*(2), 1-10. https://doi.org/10.1177/21582440221094821