# Task Complexity and the Complexity of Written Language Production: A Review of Literature

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**Abstract**

Robinson's Cognition Hypothesis (Robinson 2001a, 2003a, 2003b, 2005, 2007a, 2007b) predicts that more cognitively complex tasks along resource-directing dimension will lead to greater complexity of language production while cognitively complex tasks along resource-dispersing dimension will result in less complex language production. Various studies have investigated the effects of manipulating variables on these dimensions (i.e. resource-directing and resource-dispersing) either in oral or written language production. This paper compares and contrasts the results of several studies that were conducted by manipulating these variables in written language production. It also suggests guidelines for future research studies in this area. It concludes that further studies are necessary to investigate how language teachers can integrate and manipulate task-based instruction in their classrooms.

**Keywords:** resource-directing, resource dispersing, complexity of language production

## 1. Definitions of a Task

There are variations in the definition of a task in the literature. Several definitions have been proposed by SLA researchers for instance, Long (1985) defines a task as:

"a piece of work undertaken for oneself or for others, freely or for some reward. A few examples of tasks include painting a fence, dressing a child, filling out a form, buying a pair of shoes, making an airline reservation, borrowing a library book, taking a driving test, typing a letter, weighing a patient, sorting letters, talking a hotel reservation, writing a cheque, finding a street destination and helping someone across the road. In other words, by 'task' is meant the hundred and one things people do in everyday life, at work, at play, and in between. "Tasks" are the things people will tell you they do if you ask them and they are not applied linguists" (p.89).

In the context of language learning and teaching specifically, Skehan (1998) puts forward five key characteristics of a task:

• Meaning is primary

• Learners are not given other people's meaning to regurgitate

• 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 (p.95)

According to Nunan (2004), tasks differ from other kinds of activities in that they have a non-linguistic outcome. He made a comparison between a real-world or target task and a pedagogic task. Nunan (2004) defines a task as:

"a piece of classroom work that involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is focused on mobilizing their grammatical knowledge in order to express meaning and in which the attention is to convey meaning rather than to manipulate form" (p.4).

Furthermore, Jeon and Hahn (2005, p.125) describe tasks as goal-oriented, input-driven, procedure-guided, outcome-evaluated, classroom-setting, meaning-focused, related to the real world, involves learners in assuming a variety of roles and requires time for feedback". On the other hand, Van de Branden (2006) defines tasks as educational activities, which are designed and organized in order to stimulate and support learners into reaching their language learning goals.

Likewise, Ellis (2003) proposes that:

• a task is a workplan that requires learners to process language pragmatically in order to achieve an outcome that can be evaluated in terms of whether the correct of appropriate prepositional content has been conveyed.

• a task requires them to give primary attention to meaning and to make use of their own

linguistic resources, although the design of the task may predispose them to choose particular forms.

• a task is intended to result in language use that bears a resemblance, direct or indirect, to the way language is used in the real world.

• like other language activities, a task can engage productive or receptive, and oral or written skills and also various cognitive processes (p.16).

These definitions somewhat vary but they agreed that tasks promote learners' attention to meaning rather than form. In summary, a task includes recognition of the cognitive features of language learning and highlights the importance of the language production that results from performing the task.

## 2. Task Complexity

In general, there are two dominant constructs of tasks complexity; Robinson's Cognition Hypothesis, and Skehan's Trade Off Hypothesis, which is based on Limited Attentional Capacity Model (Levelt 1989, 1993).

### 2.1 Robinson's Model of Task Complexity

Robinson (2001a) proposes that task complexity is the result of the "attentional, memory, reasoning, and other information processing demands imposed by the structure of the task to the language learner" (Robinson, 2001b, p.28). This view claims that learners can rely on multiple attentional resources during task performance and complex tasks do not cause trade-off effects. The Cognition Hypothesis predicts that; "(a) task complexity leads to less fluency, greater accuracy and complexity of production, and greater amount of interaction; (b) task complexity leads to greater amounts of noticing and incorporation input in learners' production, and (c) that individual differences in relevant clusters of cognitive abilities increasingly differentiate performance as tasks increase in complexity" (Robinson, 2003a, p.68). The Cognition Hypothesis claims that more complex tasks will push development, and greater complexity and accuracy of production (Robinson, 2003a). Hence, the Cognition Hypothesis highlighted the importance of manipulating the demands of cognitive task complexity. Based on this foundation, Robinson and Gilabert (2007) provided taxonomy of task implementation features in this Triadic Componential Framework for task design, as outlined in Table 1.

Table 1. The Triadic Componental Framework for Task Classification by Robinson and Gilabert ( 2007, p.164)

| 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 participations | 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 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 order | h/l willingness to communicate |
| +/- prior knowledge | +/- shared cultural knowledge | h/l self-efficacy |

The Triadic Componental Framework (TCF) distinguishes the cognitive demands on tasks (task complexity), task conditions and perceived task difficulty. The dimensions are represented by the +/- symbols which may represent relatively greater (+) or relatively less (-) amount. Task complexity refers to the intrinsic cognitive demands of the task, and can be manipulated during task design along the two dimensions; resource-directing and resource-dispersing (Robinson, 2003a).

The task implementation features are divided along the resource-directing dimension and resource-dispersing dimension. Resource-directing dimension affects allocation of cognitive resources to specific aspects of second language (L2) code. Robinson (2011, p.15) claims that "by increasing complexity along these dimensions, initially implicit knowledge of the first language (L1) concept-structuring function of language becomes gradually explicit and available for change during L2 production". Increasing task complexity along this dimension can direct learners' attention to construct concepts and functions required by task using specific linguistic forms and at the end can lead to greater accuracy and grammatical complexity of the production. On the other hand, in resource-dispersing dimension, an increase in complexity reduces attentional and memory resources with negative consequences for production, since it creates problems for learners attempting to access their current repertoire of L2 knowledge (Robinson, 2003a). Increasing complexity along

resource-dispersing variables is important if one desires to estimate the complexity conditions under which real-world tasks are performed. Task design along these variables will promote a learner's ability to perform the task as well as reproducing the process that learners may experience in the real world. However, this will only positively influence the fluency but not the accuracy and complexity of language production.

The next dimension proposed is task conditions. Task conditions describe the interaction features based on the participation that a task might require. For example, it includes information flow in classroom participation (i.e. one-way, open solution) and grouping of participants (i.e. gender, familiarity). The third dimension, task difficulty refers to learner perceptions of the task's level of difficulty, including learners' abilities (i.e. working memory, aptitude) and affective responses (i.e. motivation, self-efficiency). These factors are also important and need to be considered when designing task.

Based on the Triadic Componential Framework, teachers and researchers may consider cognitive and affective variables of learners upon designing suitable tasks. Choices of designing the tasks can be made based on the variables so that task complexity "can be manipulated to progressively increase the cognitive demands of pedagogic tasks, so they approach the full complexity of the target task" (Robinson, 2001b, p.292). This triadic framework proposes thirty-six different classifications of features and considers variety of aspects that play a role in second language acquisition and how different tasks may be carried out to different learners. To date, Robinson's taxonomy for task design is the only task design framework that considers internal and external factors of learners in such a detailed manner.

*2.2 Skehan's View of Task Complexity*

Skehan (1996) proposes that task classification can be based upon cognitive complexity. This can be explained through what he refers to as code complexity, cognitive complexity and communicative stress, outlined in Table 2.

Table 2. Skehan's Task Complexity Analysis (Skehan & Foster, 2001, p.194)

<u>Code complexity</u>

    Linguistic complexity and variety

    Vocabulary load and variety

<u>Cognitive complexity</u>

    Cognitive familiarity

-     Familiarity of topic

-     Familiarity of discourse genre

-     Familiarity of task

    Cognitive processing

-     Information organization

- Amount of 'computation'

- Clarity of information given

- Sufficiency of information given

Communicative stress

Time pressure

Scale

- Number of participants

- Length of text used

Modality

Stakes

Opportunities for control

Table 2 shows that code complexity deals with linguistic and vocabulary difficulty of language input, while cognitive complexity is concerned with the content and the processing demands of tasks. Finally, communicative stress refers to performance condition.

Skehan and Foster (2001) view L2 learning from the Limited Attentional Capacity Model (Levelt, 1989) where there is a trade-off between attentional resources and the ongoing processes during task performance. According to this view, L2 tasks should not be too demanding in terms of cognitive complexity. This is because when learners perform a cognitively complex task; their attention will focus on one of the three areas of linguistic, which are complexity, accuracy or fluency. For example, if learners focus on the complexity, this will reduce the accuracy of the task performance. In language learning, when learners explore more complex structures or new vocabulary, they tend to produce more errors. This is as what Skehan and Foster (2001) claimed that the speech performance is linguistically less complex but has higher accuracy because L2 learners rely on simpler language forms.

In addition, the Limited Attentional capacity Model predicts that tasks which are cognitively simpler are more likely to let L2 learners to focus on both linguistic complexity and accuracy because it is less demanding of their attentional capacity. On the other hand, cognitively complex task will force learners to focus more of their attentional resources to meaning and less to form. This is known as the Trade-Off Hypothesis. In conclusion, decreasing complexity of tasks will draw learners' attention to the form of targeted language, as fewer resources will be needed to process meaning.

Robinson and Skehan share the same opinion in terms of the cognitive demand of the tasks. However, the contradiction lies on the cognitive processing and the effects of the manipulation of the tasks. The Cognition Hypothesis predicts that more complex tasks will produce more complexity of the language production whereas the Trade-Off Hypothesis expects the complexity of the production decreases as the tasks become more complex.

## 3. Research on Task Complexity in Writing

Various studies have manipulated task complexity variables in the Triadic Componential Framework. These studies have manipulated the variables along resource-directing (i.e.+/- here-and-now, +/- few elements, +/- spatial reasoning, +/- causal reasoning, +/- intentional reasoning, +/- perspective-taking) or resource-dispersing (i.e.+/- planning time, +/- single task, +/- task structure, +/- few steps, +/- independency of steps, +/- prior knowledge) dimensions. Though the reviewed studies had examined the fluency, accuracy and complexity of the tasks, only the findings on complexity of the language production is presented in this literature.

Two studies have manipulated task complexity variables ([+/- few element] and [+/- reasoning demand]) and examined the influence of the variables on L2 written production. The first study, Kuiken and Vedder (2007) investigated the effects of cognitively complex task on accuracy, syntactic complexity and lexical variety involving 75 Dutch university students of French and 84 Dutch university students of Italian. The students were asked to write letters to persuade their friends to choose a holiday destination. In a complex task condition students had to choose between 'Bed and Breakfast' places in Italy while for the simple task condition students had to choose resort places in a country outside of Europe. The complexity was measured using syntactic and lexical complexity, using T-unit[1] as the unit of analysis. Results indicated that the Italian language learners produced greater complexity (in terms of lexical variation of word frequency) in complex tasks. However, there was no evidence that the interaction of task complexity and proficiency level exists in this study.

In another study, Kuiken, Mos and Vedder (2005) asked 62 Dutch university students of Italian to write persuasive letters of choosing a holiday destination. Using T-unit as the unit of analysis, the study calculated complexity based on syntactic complexity and lexical variation. The findings found no significant influence of the difference in task complexity on the syntactic complexity or lexical variation in the linguistic performance. Notwithstanding, the study also was unable to clarify the interaction of task complexity and proficiency level. This may be due to allocation of attention during task performance varies for different level of learners. Another reason is perhaps because Kuiken and Vedder (2007) and Kuiken et al. (2005) did not include the individual difference factors of learners during task completion that may hinder the effects of task complexity.

In addition, SLA researchers have addressed the potential of reasoning demand in task complexity research. Liliati, Arshad, Eng and Nooreen (2012) focus on the effects of task complexity (i.e. +/- reasoning demand) and task conditions (i.e. individual and dyadic) on the grammar accuracy and syntactic complexity of written production. The participants were seventy-six (*n*=76) secondary school students, who learned English language as part of their syllabus. The study employs dictogloss task which was considered as low reasoning demand (-TRD) and opinion-gap task as the high reasoning demand (+TRD). Using the proportion of clauses per T-unit, the results showed that the high reasoning demand tasks produced more

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[1] Hunt (1965) proposed T-unit as "the shortest grammatically allowable sentences into which (writing can be split) or minimally terminable units" (p.20).

syntactically complex production than the low reasoning demand tasks. Learners produced greater syntactic complexity in dyadic task compared to individual tasks. The result was in accordance with Cognition Hypothesis where cognitively complex tasks will result in more complex language production (Robinson, 2007a). The study of Liliati et al. (2012) has provided relevant support to Kuiken and Vedder (2007) even though the context of the research is different: ESL (Liliati et al., 2012) and English as a Foreign Language (EFL) (Kuiken & Vedder, 2007). Although this study recognizes the impacts of cognitive demand of tasks on language production, what is needed here is a close examination of latent factors that may also have contributed to the findings such as learners' affective factors and abilities.

Two studies that have compared the effects of task types on language production are Pourdana, Karimi and Behbahani (2011) and Rezazadeh, Tavakoli and Rasekh (2011). Pourdana et al. (2011) conducted a study to examine the impacts of three types of tasks: topic writing (TWT), picture description (PDT) and text reconstruction (TRT) on language complexity. The complexity was calculated by computing the ratio of clauses per T-unit. The study suggested that learners elicited more complex language when they deal with topic writing tasks compared to picture description and text reconstruction tasks. On the other hand, Rezazadeh et al. (2011) compared the effects of task types (argumentative and instructional tasks) on complexity of the language production. The results found that argumentative tasks group produced more complex language (ratio of clauses to T-units $p = 0.001$; percentage of dependent clauses: $p = 0.000$) as compared to instructional writing tasks group.

Previous studies have also investigated the effects of planning condition. A number of studies have found that planning condition may not affect the complexity of written production (e.g., Mehnert, 1998; Mohammadzadeh, Dabaghi & Tavakoli, 2013; Nariman-Jahan & Rahimpour, 2011; Piri, Barati & Ketabi, 2012; Rahimpour & Safarie, 2011). Rahimpour and Safarie (2011) conducted a study to explore the effects of pre-task planning (PTP) and on-line planning (OLP) on thirty seven ($n$=37) EFL learners. Using descriptive writing tasks, the sophomore students were instructed to write an essay on ceremonies or festivals in their country. In PTP group, students were given 10 minutes to plan their performance and 17 minutes to commit the task. They were required to produce at least 200 words to reduce opportunities of on-line planning. In contrary, the participants in OLP group were given papers on which topic and instructions were written and they were asked to start writing immediately. The complexity was computed by using syntactic complexity measure (dependent clause per T-unit). The results showed that no significant difference of complexity of pre-task planning and on-line planning group. They justified that it is because the pre-task planning group used the time to focus on propositional content and identifying the main points while the on-line planning group spent their time finding suitable lexical terms and presumably to encode temporal and modal meanings.

Piri et al. (2012) conducted a study on comparing the effects of pre-task planning (PTP) and on-line planning (OLP) by using series of pictures in narrative tasks. Forty-five ($n$=45) EFL learners were instructed to complete narrative tasks based on the pictures provided. Using syntactic complexity (clauses per T-unit) and syntactic variety measures, they discovered that both pre-task and on-line planning do not influence the complexity of the written production.

In the same vein, Mohammadzadeh et al. (2013) conducted a study on thirty EFL learners (*n*=30) of lower-intermediate level. Task complexity was manipulated along resource-directing (+/- here-and-now) and resource-dispersing (+/- planning time) conditions. The participants were instructed to write four narrative essays (Task A: planning time, here-and-now, Task B: planning time, there-and-then, Task C: unplanned, here-and-now, Task D: unplanned, there-and-then). The unplanned and there-and-then task condition increase the complexity of the task. In here-and-now condition, participants were required to write in present tense while in there-and-then condition they need to write in past tense. In order to measure language complexity, the study used the S-nodes per T-unit formulae. One notable point in the findings is, there was no statistically different performance of the complexity of the language production performed by the groups (*p*=0.715), which means that no significant difference was found on the combined effects of manipulating +/-planning time and +/-here-and-now dimensions. These results are the same as Mehnert (1998) where he found no effect of planning on complexity. When learners were given 10 minutes of planning time, they were not able to display more complex language because of their limited capacity for attentional resources (Skehan and Foster, 1997). The result of Mehnert's supports the trade off hypotheses.

In another study in planning condition, Nariman-Jahan and Rahimpour (2011) compared the effects of planning time in dyadic tasks. The participants (*n*=144) who were the EFL learners were divided into high and low proficiency learners. The results show that the low proficiency learners elicited less complex language under planned condition. This is in line with Wigglesworth's (1997) finding that planning time did not benefit the learners who have lower language proficiency level.

The studies mentioned above have manipulated the planning time condition and have found no significant effects on language production regardless of the planning time condition. These results provide support to Robinson (2003a), that manipulating task complexity along resource-dispersing dimension will simply disperse attentional resources and affect complexity negatively because it creates problems for learners to access their current repertoire of L2 knowledge.

Nikou and Eskandarsefat (2012) manipulated reasoning demand using an information gap and a decision making tasks. Sixty EFL learners (*n*=60) were required to conduct simple decision- making and simple information-gap tasks in one session and after two weeks they were required to do complex decision-making and complex information-gap tasks. The simple and complex decision-making tasks were adopted from Gilabert (2007) while the simple and complex information-gap tasks were chosen from 'Intro and Interchange 3' books respectively. However, no further information was presented on how the degree of task complexity was differentiated. The results of paired samples t-test,showed that in decision-making tasks, task complexity had no significant effect on syntactic complexity. For information-gap tasks, data analysis revealed that there was statistically significant effect of task complexity on the complexity of language production. Although there was a significant difference, the results need to be evaluated carefully because of the way the simple and complex tasks were operationalized.

On the other hand, Rahimpour and Hosseini (2010) carried out a study to investigate the impact of task complexity (+/- here-and-now and +/- contextual support) on learners' written narratives. The participants (*n*=52) who were EFL learners, were asked to write two narratives based on two different picture stories. The simple task (here-and-now) was adopted from the Teaching the Spoken Language by Brown & Yule (1983) while the complex task (there-and-then) was a picture story adopted from Yule (1997). First, they performed the here-and-now task (present tense and context-supported) and followed by the there-and-then task (past tense and context-unsupported). The complexity was measured by calculating the ratio of S nodes per –unit (the number of sentence, indicated by tensed verbs divided by the total number of T-units). The results demonstrated that the different complexity of tasks had no effect on the complexity of the language.

In summary, previous studies have examined the effects of task complexity by manipulating various variables based on the Triadic Componential Framework. These studies have explored the impacts of certain variables on learners' language performance. In order to evaluate language performance, various measures of complexity were employed. Table 3 summarizes the studies that have explored the effects of task complexity in written language production.

Table 3. Summary of studies of task complexity in written mode

| Author | Task Complexity Variables | Task | Measures | Results |
|---|---|---|---|---|
| Kuiken and Vedder (2007) | +/- reasoning demand | Argumentative tasks<br><br>Complex task: 'Bed and breakfast' topic<br><br>Simple task: Write a letter to choose a holiday destination | - Syntactic complexity (clauses per T-unit and dependent clauses per clauses)<br><br>-Lexical complexity (types token ratio) | Learners produced more lexically varied language in a complex task. |
| Kuiken, Mos and Vedder (2005) | +/- number of elements | Persuasive essay tasks in L2 (Italian) and L1 (Dutch) | - Syntactic complexity (clauses per T-unit and dependent clauses per clauses)<br>-Lexical variation (the number of word types divided by the total number of word token) | No effects of task complexity on syntactic complexity or lexical variation. |
| Liliati, Arshad, Eng and Nooreen (2012) | + reasoning demand: an opinion gap task<br><br>-reasoning demand: a dictogloss task | Individual and dyadic task condition | Syntactic complexity (clauses per T-unit) | There was a significant effect of reasoning demand in both individual and dyadic task condition on syntactic complexity.<br><br>Participants in the +reasoning demand condition produced more syntactically complex language as compared to the –reasoning demand condition. |
| Mohammadzadeh, Dabaghi and Tavakoli (2013) | +/- planning time<br><br>+/- here-and-now | Narrative task<br><br>Using picture stories from comic strips | S nodes per T-unit | No effect of planning condition on the complexity of the language for both present tense and past tense essays. |
| Nariman-Jahan and Rahimpour (2011) | +/- planning time | How to get to your home from college and how to switch off a gas cooker that had been left out (adapted from Foster & Skehan (1996)) | Syntactic complexity (clauses per T-unit) | Low proficiency learners under planned condition produced less complex language compared to high proficiency learners. |
| Nikou and Eskandarsefat (2012) | +/- reasoning demand | - simple and complex: an information gap task<br>- simple and complex : a decision making task | Syntactic complexity (clauses per T-unit) | A decision making task did not affect the complexity of the output.<br><br>An information gap task had a significant effect on the complexity of language production. |
| Piri, Barati and Ketabi (2012) | Pre-task planning<br><br>On-line task planning | Narrative tasks based on 6 series of pictures | - Syntactic complexity (clauses per T-unit)<br>- Syntactic variety | Both pre-task planning and on-line planning did not affect complexity. |
| Pourdana, Karimi and Behbahani (2011) | Explored the effects of different task types | Topic Writing Task (TWT), a Picture Description Task | Syntactic complexity (clauses per T-unit) | Learners in a TWT task produced more complex language compared to other type of tasks. |

| | | (PDT),<br>and a Text<br>Reconstruction Task<br>(TRT) | | |
|---|---|---|---|---|
| Rahimpour and Hosseini (2010) | +/- here-and-now<br><br>+/- contextual support | - Narrative task using picture stories<br>- Simple task adapted from Brown and Yule (1983)<br>- Complex task adapted from Yule (1997) | S nodes per T-unit | Increased task complexity did not give impact to the complexity of the output. |
| Rahimpour and Safarie (2011) | +/- planning time | Descriptive essay on "Describe one of the nationwide ceremonies or festivals in your country" | Syntactic complexity (dependent clause per T-unit) | There was no difference of language production in terms of complexity exhibited by both groups. |
| Rezazadeh, Tavakoli and Rasekh (2011) | Explored the effects of different task types | Argumentative and instructional writing tasks | Syntactic complexity (clauses per T-unit and dependent clauses per clauses) | Learners in argumentative task condition outperformed the learners in instructional writing task in terms of complexity of the language production. |

## 4. Conclusion

Research on task-based instruction have explored the effects of task complexity on learners' language performance. The studies reviewed have examined the effect of task complexity on written language production either by focusing on complexity of the task, type of tasks or condition of the tasks. These studies have shown that task types, task condition or task complexity would affect learners' language performance regardless of the context or the participants of the studies. With regard to the setting, most reviewed studies were conducted either in the context of ESL or EFL. Various complexity measures were applied in these studies such as syntactic complexity, lexical complexity and lexical variation. Recognizing the interplay between task complexity and second language acquisition seems to be crucial not only to L2 learners, but also to teachers and materials developers in educational settings. Examining the recent literature on task complexity and second language acquisition highlights how understanding the relationship between these variables can make L2 learners and teachers aware of the role of task-based instruction in language classrooms. Additionally, this review provides further insights for language teachers in understanding how task-based instruction can be integrated into language teaching and learning. Further studies are necessary to determine the principles that are required to manipulate the complexity of tasks in language teaching and learning. The review would provide further insights for language learning researchers to find out the areas that were not examined fully in the literature. However, there are some limitations. The first one concerns the mode of the tasks discussed in this review. The review has discussed only the effects of task complexity on written language production. Hence, a review of the effects of other mode such as listening, reading and speaking would be fruitful. Second, this paper reviews the effects of task complexity on the complexity of language production. Other propensies of language production that should be reviewed are accuracy and fluency or maybe a wider variety of complexity measures. It

would be interesting to see whether there is a trade-off between other language production measures. Finally, in the literature reviewed, each dimension of task complexity was mostly examined in isolation either on resource-directing or resource-dispersing dimensions. Therefore, the authors of this review suggest that there is a need to examine the possibility of manipulating both dimensions simultaneously. Likewise, the other two elements in Robinson's Triadic Componential Framework; task condition and task difficulty may require further exploration. In spite of these limitations, this review is hoped to make a sound contribution to the field of task-based.

## References

Brown, G., & Yule, G. (1983). *Teaching the spoken language: an approach based on the analysis of conversational English*. Cambridge: Cambridge University Press.

Ellis, R. (2003). *Task-based language learning and teaching*. Oxford: Oxford University Press.

Foster, P., & Skehan, P. (1996). The influence of planning and task type on second language performance. *Studies in Second Language Acquisition*, *18*(3), 299-323. http://dx.doi.org/10.1017/S0272263100015047

Gilabert, R. (2007). Effects of manipulating task complexity on self-repairs during L2 oral production. *IRAL-International Review of Applied Linguistics in Language Teaching*, *45*(3), 215-240. http://dx.doi.org/10.1515/iral.2007.010

Hunt, K. (1965). Grammatical structures written at three grade levels. Champaign, IL: *National Council of Teachers of English*.

Jeon, I. J., & Hahn, J. W. (2005). Exploring EFL teachers' perceptions of task-based language teaching: A case study of Korean secondary school classroom    practice, *Asian EFL Journal*, *8*(1), 123-143.

Kuiken, F., & Vedder, I. (2007). Cognitive task complexity and linguistic performance in French L2 writing. In M. P. Garcia-Mayo (Ed.), *Investigating tasks in formal language settings* (pp. 117-135). Clevedon, England: Multilingual Matters. http://dx.doi.org/10.1075/eurosla.5.10kui

Kuiken, F., Mos, M., & Vedder, I. (2005). Cognitive task complexity and second language writing performance. In S. Foster-Cohen, M.P. Garc á-Mayo, & J. Cenoz (Eds.), *EUROSLA yearbook* (pp. 195-222). Amsterdam: John Benjamins.

Levelt, W. (1989). *Speaking: From intention to articulation*. Cambridge, MA: MIT.

Liliati, I., Arshad, A. A., Eng, W. B., & Nooreen, N. (2012). Effects of task reasoning demand and task condition on learner written output in ESL classrooms. *International Journal of Education*, *4*(4), 157-175.

Long, M. H. (1985). A role for instruction in second language acquisition: Task-based language teaching. In K. Hyltenstam, & M. Pienemann (Eds.), *Modelling and assessing second language acquisition* (pp. 77-99). Clevedon, UK: Multilingual Matters.

Mehnert, U. (1998). The effects of different lengths of time for planning on second language performance. *Studies in Second Language Acquisition*, *20,* 83-108. http://dx.doi.org/10.1017/S0272263198001041

Mohammadzadeh, M. A., Dabaghi, A., & Tavakoli, M. (2013). The effects of simultaneous use of pre-planning along +/- here-and-now dimension on fluency, complexity and accuracy of Iranian EFL learners' written performance. *International Journal of Research Studies in Language Learning*, *2*(3), 49-65. http://dx.doi.org/10.5861/ijrsll.2012.168

Nariman-Jahan, R., & Rahimpour, M. (2011). The effects of planning and proficiency on language production of writing task performance. *Educational Research*, *2*(9), 1528-1537.

Nikou, F., & Eskandarsefat, Z. (2012). The simultaneous effects of task complexity and task types on EFL learners` written performance. *Australian Journal of Basic and Applied Sciences*, *6*(7), 137-143.

Nunan, D. (2004). *Task-based language teaching*. Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511667336

Piri, F., Barati, H., & Ketabi, S. (2012). The effects of pre-task, on-line, and both pre-task and on-line planning on fluency, complexity, and accuracy – The case of Iranian EFL learners' written production. *English Language Teaching*, *5*(6), 158-168. http://dx.doi.org/10.5539/elt.v5n6p158

Pourdana, N., Karimi Behbahani, M., & Safdari, M. (2011). The impact of task types on aspects of Iranian EFL learners' writing performance: Accuracy, fluency, and complexity. *IPEDR*, *20*, 261-265.

Rahimpour, M., & Hosseini, P. (2010). The impact of task complexity on L2 learners' written narratives. *English Language Teaching*, *3*(3), 198-206. http://dx.doi.org/10.5539/elt.v3n3p198

Rahimpour, M., & Safarie, M. (2011). The effects of on-line and pre-task planning on descriptive writing of Iranian EFL learners. *International Journal of English Linguistics*, *1*(2), 274-281. http://dx.doi.org/10.5539/ijel.v1n2p274

Rezazadeh, M., Tavakoli, M., & Rasekh, A. E. (2011). The role of task type in foreign language written production: Focusin g on fluency, complexity, and accuracy. *International Education Studies*, *4*(2), 169-176. http://dx.doi.org/10.5539/ies.v4n2p169

Robinson, P. (2001a). Task complexity, cognitive resources, and syllabus design: A triadic framework for examining task influences on SLA. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 287-318). Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9781139524780.012

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

Robinson, P. (2003a). Attention and memory during SLA. In: C. Doughty and M. Long, eds. *Handbook of second language acquisition* (pp. 631-678). Oxford: Blackwell. http://dx.doi.org/10.1002/9780470756492.ch19

Robinson, P. (2003b). The cognition hypothesis, task design, and adult task-based language learning. *Second Language Studies*, *21*(2), 45-105.

Robinson, P. (2005). Cognitive complexity and task sequencing: Studies in a Componential Framework for second language task design. *International Review of Applied Linguistics, 43*(1), 1–33. http://dx.doi.org/10.1515/iral.2005.43.1.1

Robinson, P. (2007a). 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*, *45*(3), 193-213. http://dx.doi.org/10.1515/iral.2007.009

Robinson, P. (2007b). Criteria for grading and sequencing pedagogic tasks. In M.P. Garcá Mayo (Ed.), *Investigating tasks in formal language learning* (pp. 7-27). Clevedon: Multilingual Matters.

Robinson, P. (2011). Task-based language learning: A review of issues. *Language Learning*, *6*, 1-36. http://dx.doi.org/10.1111/j.1467-9922.2011.00641.x

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*, 161-76. http://dx.doi.org/10.1515/iral.2007.007

Skehan, P. (1996). A framework for the implementation of task-based instruction. *Applied Linguistics*, 17(1), 38-62. http://dx.doi.org/10.1093/applin/17.1.38

Skehan, P. (1998). *A Cognitive Approach to Language Learning*. Oxford: Oxford University Press.

Skehan, P., & Foster, P. (1997). Task type and task processing conditions as influences on foreign language performance. *Language Teaching Research*, *1*(3), 185-211. http://dx.doi.org/10.1177/136216889700100302

Skehan, P., & Foster, P. (2001). Cognition and tasks. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 183-205). Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9781139524780.009

Van den & Branden, K. (2006). *Task-based language teaching: From theory to practice*. Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511667282

Wigglesworth, G. (1997). An investigation of planning time and proficiency level on oral test discourse. *Language Testing*, *14*, 167-197. http://dx.doi.org/10.1177/026553229701400105

Yule, G. (1997). *Referential communication tasks*. Hillsdale, NJ: Erlbaum.