# Possible Involvement of Implicit Learning in Task Repetition

Koichi YAMAOKA

Fluency, accuracy, and complexity are “major research variables in applied linguistic research” (Housen & Kuiken, 2009). From the educational standpoint, they are also the three main goals to be achieved by learners (Skehan, 1996). However, fluency, accuracy, and complexity are hypothesized to be in a trade-off relationship, where prioritizing one can have negative effects on the others (Skehan, 2009). The trade-off relationship has been reported between complexity and accuracy (Foster & Skehan, 1996; Mehnert, 1998; Skehan & Foster, 1997) and between fluency and accuracy (Yuan & Ellis, 2003). In contrast, Robinson (2001) argued, based on multiple resource theory, that there is no attentional competition. He argued that fluency, accuracy, and complexity in tasks can be explained by task complexity, by drawing on the concept of cognitive dimensions: namely the resource-directing and resource-depleting dimensions. Wang and Skehan (2014) argued, in their counterargument to this hypothesis, that the assumption of Trade-off Hypothesis “does not mean that the effects of Trade-off are unavoidable” (p.156) and that “a major contribution of task research is to explore how task characteristics and task conditions can mitigate its effects” (p.156).

Task repetition is one of the possible ways to mitigate trade-off relationships. Simultaneous positive effects of task repetition have been reported on fluency and complexity (Ahmadian, 2011; Ahmadian & Tavakoli 2011; Bygate, 2001), and sometimes also on accuracy (Saeedi & Kazerooni, 2014; Thai & Boers, 2016; Wang, 2014).

Some explanations for the effects have also been provided in the literature. For example, Wang (2014) conducted video description tasks with participation of 77 undergraduate students with TOEFL scores of 540 to 630 in order to investigate the effects of intervention conditions by tapping into different stages of speech production in terms of strategic and online planning, pre-watched condition, and immediate task

repetition. They found large simultaneous improvements was observed in fluency, accuracy, and complexity in the repetition condition. Wang (2014) attributed the improvement in accuracy to the allocation of released attentional resources to monitoring. Fukuta (2016) conducted tasks of narrating six-frame cartoons twice with an interval of 1 week with participation of 28 university students at the CEFR (= Common European Framework of Reference for Languages) B2 level. They confirmed the positive effects on accuracy and attributed the improvements to the shift in attention orientation from conceptualization to formulation. However, no improvements were observed in fluency and complexity. Skehan et al. (2012) argued that task repetitions can be a form of planning, which enhances the level of preparedness for the task. Skehan (2014) slightly mentioned the possible involvement of priming. However, he provided an explanation for effects of task repetition from the perspective of task preparation by stating "[n]ot only may the act of speaking establish a better trace for subsequent performance (in that it is more enduring), it also, vitally, is a better preparation for subsequent performance" (p. 218). Sheppard and Ellis (2018) referred to the transfer appropriate processing hypothesis as a theoretical ground for the effects of task repetition. Transfer appropriate processing is “a theory that memory performance is better when the cognitive processes engaged during retrieval match the cognitive process that were engaged when the material was encoded” (American Psychological Association, n.d.).

Proceduralization is another explanation (De Jong & Perfetti, 2011; Suzuki, 2020). For example, De Jong and Perfetti (2011) conducted a task-repetition study with participation of 47 university students at the intermediate level. The participants were allocated to two task-repetition condition groups (one with a delayed test and the other without a delayed test) and one no-task-repetition condition group. The repetition groups engaged in tasks with the 4/3/2 technique, where they talked about the same topic in 4 minutes, 3 minutes, and 2 minutes. The participants engaged in three such sessions with one-week intervals between the pre- and post-tests, and one group was followed with a four-week delay test. Participants were informed about fluency at the beginning of each session. They were also provided with an opportunity to self-evaluate and reflect on their performance after each task. The participants received feedback after each session. Their fluency improved as seen in the post test, and transferred to their performance with new topics. The effects were retained after four weeks. They explained the results in terms of proceduralization, based on changes in

*mean length of pause, phonation-time ratio, and mean length of run.*

Among several factors that may be involved in task repetition, an under-investigated one is implicit learning. Implicit learning can be a factor because task repetition inevitably provides an opportunity to encounter the same or similar patterns of forms repeatedly with meaning. Repetition can contribute toward implicit learning. As Ellis (2005) stated, "each language processing usage results in the elements of the construction being primed and made more available in memory as a result" (p. 321). Lambert et al. (2017) investigated 6-time immediate task repetitions among 32 university students at different English proficiency levels during a 90-minute class. They confirmed the positive effects on fluency. They interpreted decreased pausing inside clauses as an indication of the possible facilitation of encoding mechanisms through priming effects. "In the context of language use, priming refers to the phenomenon in which prior exposure to language somehow influences subsequent language processing" (McDonough et al., 2009, p. 1). Priming is associated with implicit memory instead of implicit learning (Buchner & Wippich, 1998; McDonough et al., 2009), where implicit memory is "information acquired during a single episode" (Buchner & Wippich, 1998, p.7). However, Bock and Griffin (2000) mentioned that priming has all the characteristics of implicit learning. Chang et al. (2006) claimed that "structural priming is a form of error-based implicit learning" (p. 245). If this is so, the results reported in Lambert et al. (2017) may suggest the involvement of implicit learning during task repetition.

## Instruction, Learning, and Knowledge

First, instruction, learning, and knowledge should be distinguished. Table 1 provides a rough overview of instruction, learning, and knowledge. Schmidt (1994) recommended distinguishing between explicit instruction and *explicit learning* by referring to the former as "telling subjects the rules in experimental studies or teaching them about a language in classroom settings" (p. 20). In their meta-analysis study, Norris and Ortega (2000) considered instructional treatment as explicit "if rule explanation comprised any part of the instruction" (p.437) or "if learners were directly asked to attend to particular forms and to try to arrive at metalinguistic generalizations on their own" (p. 437), whereas instructional treatment was considered as implicit "when neither rule presentation nor directions to attend to particular forms were part of a treatment" (p.437).

Schmidt (1994) also recommended distinguishing between implicit and explicit learning and knowledge by stating that "the first set refers to the processes of learning, the second to the end-products of learning (or sometimes to knowledge that is innate and not learned at all)" (p. 20). *Implicit learning* is the process of learning something without intending to do so, whereas *explicit learning* is the process of learning something with conscious intention (DeKeyser, 2003). Figure 1 presents a schematic diagram from instruction to performance. Instruction results in learning, which leads to knowledge. The resultant knowledge is used to produce performance.

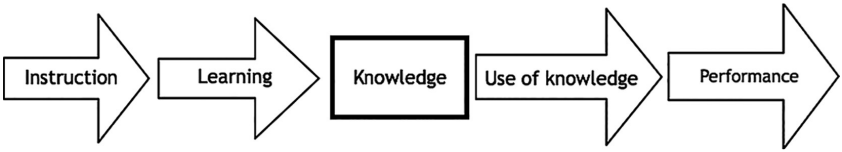
**Table 1**

*Overview of Instruction, Learning, and Knowledge*

| | Instruction | Learning | Knowledge |
|---|---|---|---|
| Explicit | Explicit Instruction | Explicit Learning | Explicit Knowledge |
| Implicit | Implicit Instruction | Implicit Learning | Implicit Knowledge |

**Figure 1**

*Schematic Diagram from Instruction to Performance*




*Note.* Instruction results in learning, which leads to knowledge. The resultant knowledge is used to produce performance.

### Implicit Learning and Implicit Knowledge

Implicit learning primarily results in *implicit knowledge,* whereas explicit learning results in *explicit knowledge* (Rebuschat, 2013). *Implicit learning* is learning without awareness (DeKeyser, 2003; Schmidt, 1994). The most common defining feature of implicit knowledge in the literature is the lack of awareness (Han & Ellis, 1998; Roehr-Brackin, 2015). Implicit knowledge is automatic (Ellis, 2008; Han & Ellis, 1998; Roehr-Brackin, 2015; Shin & Christianson, 2012) and unanalyzed (Han & Ellis, 1998;

Roehr-Brackin, 2015), and requires minimal attentional resources (Seger, 1994). Another key issue in implicit learning is abstractness. Whether implicit learning involves surface structures or abstract rules is a matter of great controversy (Seger, 1994). Still, Reber (1989) stated that "implicit knowledge results from the induction of an abstract representation of the structure that the stimulus environment displays" (p. 219). Long endurance is also reported (Allen & Reber, 1980; Bock & Griffin, 2000).

The transferability of implicit knowledge has also been reported in the studies on artificial grammar. With respect to the transfer of implicitly learned artificial grammar to a different set of letters following the same rules, Reber (1969) argued that some abstraction was involved, whereas the surface structure still mattered. Manza and Reber (1997) proposed a model that combined chunking and abstraction, as a plausible explanation for the transfer of implicitly learned artificial grammar.

Knowledge and its use should be clearly distinguished. Although implicit and explicit knowledge are two different things, their use can be simultaneous. Learners may develop and draw on both implicit and explicit knowledge (Ellis, 2009a). It is possible that implicit knowledge works automatically behind the scenes even when explicit knowledge is in use, because the former does not require awareness. Thus, the use of explicit knowledge does not exclude the use of implicit knowledge.

## Interface

There are three positions explaining the relationship between both types of knowledge (Ellis, 2005). The non-interface position argues that implicit knowledge and explicit knowledge are unrelated to each other. For example, Krashen (1981) has argued that the *acquired system* (or implicit knowledge) is initially used to produce utterances and *conscious learning* (or explicit knowledge) is only used for the sake of monitoring in order to change the output. The strong-interface position states that explicit knowledge can be proceduralized to be similar to implicit knowledge. DeKeyser (2003), for example, stated "[e]ven though implicitly acquired knowledge tends to remain implicit, and explicitly acquired knowledge tends to remain explicit, explicitly learned knowledge can become implicit in the sense that learners can lose awareness of its structure over time" (p. 315). However, DeKeyser (2018) stated that proceduralization does not mean that declarative (or explicit) knowledge changes its nature into proceduralized (or implicit) knowledge. The weak-interface position maintains interactions between both types of knowledge. It maintains that explicit

knowledge facilitates the acquisition of implicit knowledge. For example, Ellis (2011) has argued that explicit knowledge helps with noticing and leads to the acquisition of implicit knowledge through subsequent implicit learning as "the primary mechanism of explicit language learning is the initial registration of pattern recognizers for constructions that are then tuned and integrated into the system by implicit learning during subsequent input processing" (p. 308).

Another important perspective is that implicit and explicit learning can take place simultaneously (Bell, 2017; Seger, 1994; Shin & Christianson, 2012). As Hulstijn (2002) put it, "since implicit learning takes place as an unstoppable information processing mechanism, it will automatically accompany explicit learning activities" (p. 208). The same thing can be said about the use of knowledge. While implicit knowledge and explicit knowledge are dissociated (Ellis, 2009a), learners can develop both implicit knowledge and explicit knowledge, and they can draw on both types of knowledge (Ellis, 2009a). In sum, implicit knowledge is expected to work automatically without awareness even when explicit knowledge is in use. This makes a suggestion that implicit learning and the resultant implicit knowledge can be in place during task repetitions, and can contribute toward making improvements in task performance.

## Task Repetition

The term *task* refers to "an activity in which meaning is primary, there is some sort of relationship to the real world, task completion has some priority, and the assessment of task performance is in terms of task outcome" (Skehan, 1996, p. 38). Ellis (2009b) also provided four criteria to define a task: (a) primary focus on meaning, (b) existence of a "gap," (c) reliance on learners' own resources, and (d) an outcome to be achieved.

Effects of various factors on task performance have been vigorously investigated on fluency, accuracy, or complexity (For example, Ahmadian, et al., 2015; Bui, 2014; Bui & Huang, 2018; D'Ely et al., 2019; Foster & Skehan, 1996; Lambert, et al., 2017; Lynch & Maclean, 2000; Mehnert, 1998; Saeedi & Kazerooni, 2014; Skehan, et al., 2012; Skehan & Foster, 1999, Wang, 2014; Yuan & Ellis, 2003). Effects of interim activities have been also investigated (Sheppard & Ellis, 2018).

Of these factors, task repetition has been reported to be effective for simultaneous enhancement of fluency, accuracy, and complexity (Ahamadian, 2011; Ahmadian & Tavakoli, 2011; Bygate, 2001; D' Ely et al., 2019; Gashan & Almohaisen, 2014;

Saeedi & Kazerooni, 2014; Thai & Boers, 2016; Wang, 2014). Figure 2 shows some of the studies that include task repetition. The table extracted effects of task repetition, as some of the studies investigated task repetition in combinations with other factors. Some studies have reported simultaneous improvements in fluency and complexity (Ahamadian, 2011; Ahmadian & Tavakoli, 2011; Bygate, 2001), fluency and accuracy (D'Ely,2019; Gashan & Almohaisen, 2014), and even in all the three constructs (Saeedi & Kazerooni, 2014; Thai & Boers, 2016; Wang, 2014).

Task repetition can be perceived as two dimensional in terms of content and procedure. Kim and Tracy-Ventura (2013) proposed the categorization of task repetition into *exact* and *procedural repetition.* The former involves the same content and procedure whereas the latter involves "the same procedure but a different content" (Kim & Tracy-Ventura, 2013, p. 831). Ahmadian (2011) conducted the same narrative task involving a silent film 11 times with two-week intervals between each task. This was an exact repetition.

**Table 2**

*Effects of task repetition in the literature*

| Study | Task | F | A | C | No. | Interval | Type |
|---|---|---|---|---|---|---|---|
| Bygate (2001) | Narrative task (a film cartoon)<br>Interview (life in Britain) | ○ | × | ○ | 2[a] | 10 weeks | E/P[a] |
| Ahmadian & Tavakoli (2011) | Recounting a 15-minute silent film | ○ | × | ○ | 2 | 1 week | E |
| Ahamadian (2011) | Narrative (retelling a 10-minute silent film)<br>Interview (personal experiences, once) | ○ | × | ○ | 11 | 2 weeks | E |
| De Jong & Perfetti (2011) | The 4/3/2 task; speak about a given topic<br>- Exact repetition (as Repetition)<br>- Procedural repetition (as No repetition) | ○<br>× | -<br>- | -<br>- | 3x3[b] | 3sessions /2 weeks | E<br>P |
| Kim & Tracy-Ventura (2013) | Communicative information-exchange tasks<br>- Exact repetition<br>- Procedural repetition | × | ×○[d] | × | 3 | 3 times /one week[c] | E<br>P |
| | | × | ×○[d] | ×[e] | | | |
| Saeedi & Kazerooni (2014) | Retelling stories of sequential pictures<br>- Loosely structured<br>- Tightly structured | ○<br>○ | ×<br>○ | ○<br>○ | 2 | 1 week | E |
| Wang (2014) | Video description tasks | ○ | ○ | ○ | 2 | Immediate | E |
| Gashan & Almohaisen, (2014) | Spotting the differences between two pictures | ○ | ○ | - | 2 | 2 weeks | E |
| Fukuta (2016) | Describing six-frame cartoons | × | ○ | × | 2 | 1 week | E |
| Thai & Boers (2016) | Talk about a given topic.<br>- 4/3/2<br>- constant time | ○<br>○ | ×<br>○ | ×<br>○ | 3x2[f] | Immediate | E |
| Lambert et al. (2017) | Instruction, narration, and opinion | ○ | - | - | 6 | Immediate | E |
| D'Ely et al. (2019) | Narrative task (Retelling a cartoon film) | ○ | ○ | × | 2 | 4 weeks | E |

*Notes*. F = fluency; A = accuracy; C = complexity; No. = the number of task implementations; E = exact repetition; P = procedural repetition; ○ = improved; × = not improved; – = not applicable.

[a] Treatment 1 + Treatment 2 (= 2 x 3 times, overlapping one task) + Data (repeated and new)

[b] three sessions of 4/3/2 training

[c] the whole procedure (= pre-test, three main tasks, post-test 1, and post-test 2) over four weeks

[d] left = global accuracy, right = use of simple past

[e] slight tendency of increase in syntactic complexity with the procedural repetition group

[f] two sessions of 4/3/2 training/constant-time training

Kim and Tracy-Ventura (2013) investigated exact and procedural repetitions of information-exchange tasks among 36 high school students in Korea. The participants engaged in information-gap tasks, where they exchanged information on a given topic such as school events. Pre-test, three main tasks, and post-tests 1 and 2 were conducted over a period of four weeks. The accuracy of the use of the simple past form improved in both groups. Neither fluency nor complexity changed in either group, although a slight tendency in the syntactic complexity was observed in the procedural repetition group. Whether procedural repetition yields improvements in fluency, accuracy, and complexity is of great interest because such improvements can serve as an indication of the abstraction involved in implicit learning during task repetition.

Implicit learning is expected to take place with the frequency effects of the same patterns of constructions (Ellis, 2002). Task repetition is expected to fulfill such conditions. For example, De Jong and Tillman (2018) conducted picture description tasks of six-frame cartoons. One group engaged in the task following the 4/3/2 method, whereas the other group performed under constant time limitations. They analyzed repeated task performance in terms of unigrams, trigrams, and part-of-speech trigrams. They confirmed the reuse of the same patterns longer than single words. The findings show that the same patterns were frequently used in task repetition. This suggests the possibility of the involvement of implicit learning during task repetition.

## Discussion and Conclusion

Ellis (2011) argued that noticing as an initial register of patterns followed by successive priming of patterns can lead to implicit learning. Although priming is associated with the implicit memory of an episode instead of the implicit learning of abstract rules, Shin and Christianson (2012) argued "that structural priming itself has a cognitive function in L2 learning as a form of implicit learning" (p. 957). Implicit learning occurs with frequent exposure to the same patterns with meaning. Task repetition provides such conditions. The resultant implicit knowledge is expected to lead to automatic and long-lasting effects on task performance. Implicit and explicit knowledge can be simultaneously obtained and available simultaneously during performance. Therefore, the existence and use of explicit knowledge does not necessarily exclude the use of implicit knowledge. In other words, implicit and explicit knowledge are two pieces to be combined in order to realize maximum effects in language learning and acquisition. There is no reason to exclude implicit learning from

possible factors for the effects of task repetition. Rather, the involvement of implicit learning is strongly suggested, considering the emphasis on meaning rather than on forms in tasks and the repeated exposure to the same patterns of constructions during task repetition. As the processing of implicit knowledge requires minimum attention, implicit knowledge is expected to reduce the cognitive burden, which, in turn, can result in higher fluency, accuracy, and complexity. Thus, the simultaneous improvement of fluency, accuracy, and complexity supports the evidence of implicit learning. Transfer to a new task such as in procedural repetition may be an indication of implicit learning involving abstraction.

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# Possible Involvement of Implicit Learning in Task Repetition

Koichi YAMAOKA

**Abstract**

This article does not present the findings of an empirical study, but rather those of a literature review and provides some thoughts on implicit learning in task repetition. This article first briefly reviews the literature for some explanations on the effects of task repetition, and then introduces implicit learning as a possible explanation for the effects of task repetition on task performance. After clearly distinguishing instruction, learning, and knowledge, more details are provided on the issue of implicit learning and implicit knowledge. Implicit learning does not require awareness and results in automatic implicit knowledge. Such implicit knowledge is expected to reduce cognitive burden, resulting in improvement of task performance. At the same time, task repetition provides frequent exposure to the same patterns of constructions, which is a good condition for implicit learning. Thus, implicit learning is likely to occur in task repetition. Additionally, some studies argue that implicit learning involves the abstraction of rules, unlike implicit memory of episodes. Transfer of the effects can be an evidence for the involvement of implicit knowledge with abstraction. It contends that implicit learning is the missing piece in explaining the effects of task repetition and that there is a fair reason for hypothesizing the involvement of implicit learning in task repetition.