

**Differential Accessibility of Implicit and Explicit Grammatical Knowledge to
EFL Learners' Language Proficiency**

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Abstract

Considering the future of the application of a dual explicit-implicit learning system to the L2 theory and research, Ellis (2006) argues that further investigation of the distinction is useful for modeling, understanding, and measuring second language proficiency. This study explored the differential accessibility of EFL learners' explicit and implicit grammatical knowledge to their language proficiency. The participants were 160 EFL graduate and undergraduate students at Shahrekord University (Iran). A test battery including a timed grammaticality judgment test

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(GJT), an untimed GJT, and a TOEFL was used to gather the data. A set of correlation coefficients was computed to explore the contributions of implicit and explicit grammatical knowledge to the TOEFL and its sub-components. The results showed that there was no statistically significant correlation between the EFL learners' implicit grammatical knowledge and their TOEFL (sub-components) scores, but there was a strong relationship between the EFL learners' explicit grammatical knowledge and their general proficiency. A medium relationship also existed between the explicit knowledge and the TOEFL sub-components. Then, a Standard Multiple Regression demonstrated that explicit knowledge better predicted the EFL learners' general L2 proficiency. The results suggest that learning explicit grammatical knowledge is necessary in EFL contexts and needs much more consideration when the primary focus is on the cognitive academic language proficiency or skills.

Keywords: Implicit/explicit grammatical knowledge; General language proficiency; Differential accessibility

Introduction

The development and assessment of L2 learners' grammatical knowledge have always been one of the major concerns of second or foreign language teaching though it has also been associated with its own ebbs and flows once being the center of all pedagogical activities and once the target of criticisms. Even recent models of communicative competence or language ability could not wholly jettison the concept and have incorporated 'grammatical competence' (Canale, 1983; Canale & Swain, 1980) as one of the essential components of their models or subsumed it under 'organizational competence' as one of the two building-blocks of any learner's language competence (Bachman, 1990; Bachman & Palmer, 2010).

Grammatical knowledge has recently been probed and discussed in terms of two types of knowledge, implicit and explicit. The distinction of implicit and explicit grammatical knowledge and their differential roles and contributions to the second language development have been an interesting source of attention and a fruitful area of inquiry for some second language acquisition (SLA) researchers (e.g. Elder & Ellis, 2009; Ellis, 2004, 2005, 2006; Green & Hecht, 1992; Philp, 2009). For Instance, Ellis (2006) found that difficulty of grammatical structures varied according to whether one is considering implicit or explicit knowledge of grammar.

He observed that those structures that are easy in terms of implicit knowledge may be difficult in terms of explicit knowledge and vice versa. He then concluded that measures of both implicit and explicit grammatical knowledge might have differential contributions to the development and assessment of general L2 proficiency.

It is also argued that, in EFL (English as a Foreign Language) settings, different L2 learners with idiosyncratic characteristics, different goals of learning, and varying levels of L2 motivation become engaged in different types of learning pathways and pedagogical activities. For instance, in some settings, the L2 education they receive is mostly based upon traditional, descriptive, deductive grammatical instructions and less on providing the learners with opportunities to use the language in social interactions in and out of the classroom. Still, in other settings, the instruction the learners receive has recently adopted more elements of the 'focus-on-form' (FonF) approach. That is, the learners are primarily engaged in task-based, meaning-focused pedagogical activities and are provided with form-focused instruction and explicit grammatical information either when the instructors notice a gap in the learners' L2 (grammatical) knowledge or when the learners report difficulties with one or more grammatical structures comprehending or producing the second language. The outcome of such pedagogical variations within educational contexts could be that different learners develop different types and levels of L2 grammatical knowledge that contribute differently to their general language proficiency.

The importance of the implicit-explicit distinction for language learning, knowledge and instruction has been reiterated in the recent collection of papers edited by Ellis et al. (2009). Further investigation of different aspects of the distinction will provide the basis for re-examining the nature of the relationship between implicit and explicit knowledge and general proficiency and will be illuminating for both SLA and the teaching and testing practice. This study was an attempt to discern whether Iranian EFL students' implicit and explicit grammatical knowledge accounts differentially for the development of the learners' language proficiency and their performance on different sub-components of a measure of general language proficiency.

Literature Review

The distinction between implicit and explicit learning and knowledge has originated in cognitive psychology. In the first place, there has for long been much controversy in cognitive psychology over whether human cognition should be envisioned in the form of a unitary knowledge source capable of achieving different learning outcomes (Shanks, 2003) or as multiple, differentiated learning systems (Reber, 1976; Anderson, 1983; Anderson & Lebiere, 1998; Hazeltine & Ivry, 2003). In the second place, the controversy took a different form and direction within the camp of the proponents of distinct learning systems as how to theorize about the interplay between the functionally and neurally separate learning systems. Among different models of multiple learning systems in cognitive psychology, Anderson's (1983, 1985) as well as Anderson and Lebiere's ACT-R model has over the years been highly influential in shaping and directing L2 theory and research. Specifically, the ACT-R model's argument for a dual knowledge system consisting of declarative knowledge (i.e., knowing *that* something is the case) and procedural knowledge (i.e., knowing *how* to do something) that are stored differently has been the impetus to the SLA studies dealing with implicit-explicit knowledge sources. The ACT-R model of human architecture posits a dual long-term memory system (declarative vs. procedural), besides the short-term working memory, that is at work processing, storing, and retrieving information. In this model, practice or repeated activation plays a central role in automatization and predeudalization of declarative knowledge.

As noted above, inspired by the ACT-R model, cognitive psychologists (e.g., Wallach & Lebiere, 2003; Hazeltine & Ivry, 2003) argue for a hybrid learning system consisting of distinct implicit and explicit learning mechanisms. According to Ellis et al. (2009), the advocates of the existence of a dual learning system make a distinction between implicit and explicit learning in two principal ways. First, they believe that implicit learning continues without any demands on central attentional resources. N. Ellis (2008) argues that "generalizations arise from conspiracies of memorized utterances collaborating in productive schematic linguistic constructions" (p. 7). Thus, the resulted knowledge is subsymbolic, which reflects statistical sensitivity to the structure of the learned material. But, explicit learning involves memorization of a series of successive facts and makes heavy demands on working memory. So it takes place consciously while resulting in symbolic knowledge; that is, it is represented in an explicit form. Second, in

implicit learning, learners are unaware of the learning taken place, though this learning is evident in their behavioral responses. The learners thus, cannot verbalize what they have learned. But in explicit learning, learners are aware of what they have learned; so, they can verbalize what they have learned (Ellis et al.).

Ellis et al. (2009) add that this evident controversy in cognitive psychology is reflected in SLA as well. One clear example is found in the critiques against Krashen's (1981) distinction between 'acquisition' (which is defined as the subconscious internalization of grammatical rules which occurs due to the comprehending input which is beyond the learners' existing level of knowledge) and 'learning' (that is the conscious formulation of the explicit grammatical rules). At first, it was criticized hard because the distinction was not falsifiable. For example, McLaughlin (1978) asserts that Krashen could not give adequate definitions of what he meant by 'subconscious' and 'conscious' and he could not set a way for independently determining whether a specific process involves learning or acquisition. Schmidt (1990, 1994, 2001) argues that consciousness is a useful construct if one can carefully deconstruct it into several meanings. He conceptualizes consciousness in terms of the binary cognitive constituents and the related learning systems of intentionality (incidental vs. intentional learning), attention (attended vs. unattended learning), awareness (implicit vs. explicit learning), and control (automatic vs. controlled processing). Schmidt (1994, 2001) has re-affirmed the value of 'consciousness' for understanding the nature of second language learning. His reinstatement of the concept has greatly influenced SLA theories and research. He maintains that Krashen may be initially right in making a distinction between implicit and explicit processes. However, this distinction is simplistic since Krashen failed to deconstruct consciousness into intentionality, attention, awareness, and control (Schmidt, 1994).

Much earlier than Ellis et al. (2009), N. Ellis (1994) edited another collection of papers in which the importance of the implicit/explicit distinction for both L1 and L2 learning was affirmed. He used research in both cognitive psychology and language learning to explain the issues facing researchers to spell out, for example, which aspects of L2 can be learned implicitly, which mechanisms of explicit learning are available to the learner, how necessary the explicit knowledge is for the acquisition of an L2, how best the instruction can aid L2 acquisition, and so on. Thus, instead of dismissing the distinction between implicit and explicit learning/knowledge, SLA researchers have focused on identifying the processes

involved in the two types of learning, on their interaction, and on how they can be externally manipulated through instruction. Thus, while the doubts still remain, especially in cognitive psychology, on the legitimacy of a dual learning system, Ellis assumes that a distinction can be made between the implicit and explicit learning of an L2 and between implicit and explicit L2 knowledge (N. Ellis, 1994). Both Schmidt (1994) and Ellis et al. (2009) maintain that implicit/explicit learning and implicit/explicit knowledge are related but distinct concepts which need to be separated. In this sense, implicit/explicit learning refers to the processes involved in learning, and implicit/explicit knowledge refers to the products of learning. For example, there is the possibility that learners reflect on knowledge that they have acquired implicitly without metalinguistic awareness and subsequently develop an explicit representation of it. There is also another possibility that explicit learning of one linguistic feature may result in the incidental implicit learning of some other features. In the case of SLA, researchers have examined the kinds of knowledge resulted from the conditions in favor of one or other type of learning, that is, either exploring the actual involved processes or the products of learning.

Definitions of Explicit and Implicit Knowledge

In Ellis's (2004) view, it is better to see these two types of knowledge as dichotomous. He argues that where representation is concerned, these two types of knowledge are separate. Thus, in performing different tasks, it is likely that learners draw differentially on different (implicit or explicit) knowledge sources. Ellis then enumerates the key characteristics of explicit L2 knowledge with referring to implicit knowledge.

Explicit knowledge is conscious. Contrary to implicit L2 knowledge which is completely tacit, explicit knowledge is conscious, that is, learners know what they know, they are consciously aware of some L2 aspects or features. Thus, conscious awareness must be distinguished from intuitive awareness. According to Karmiloff-Smith (1979), a kind of distinction must be made between metalinguistic data and epilinguistic data. Intuitive awareness (or in Karmiloff-Smith's terms, epilinguistic behavior) is available in the learners' intuition ability to recognize instantly that one sentence is ungrammatical. Conscious awareness (or metalinguistic behavior) is present when learners can recognize why a sentence is ungrammatical.

Explicit knowledge is declarative. It is composed of some facts about L2 which are concerned with both rule-based knowledge and knowledge of fragments. Explicit knowledge of an L2 is therefore encyclopedic in nature (Ellis, 2006). These language facts are only loosely connected; it means that they do not constitute a system in the similar way that the implicit knowledge of proficient L2 users does. To a great degree, the L2 declarative facts may be stored separately which can be easily accessed on distinct information units (Ellis, 2004).

L2 learners' declarative rules are often imprecise and inaccurate. As Ellis (2006) argues, implicit knowledge, after being established in a learners' interlanguage, is highly systematic in contrast to the explicit knowledge which is imprecise, inaccurate, and inconsistent. Explicit knowledge may be less structured than implicit knowledge as well and thus held with less certainty.

The development of a learners' explicit knowledge can take place on two planes. It means that explicit knowledge can grow in breadth when the learner accumulates more declarative facts about the language. It can also advance in depth when the learner refines the existing explicit knowledge to make it more precise and accurate and to apply it more consistently across different contexts and languages (Ellis, 2004). Some SLA researchers (e.g., Butler, 2002; Green & Hecht, 1992; Sorace, 1985) have pointed to a relationship between the quality of learners' explicit knowledge and their overall proficiency, but one cannot interpret this relationship as demonstrating that explicit knowledge promotes the implicit knowledge development (Bialystok, 1994).

Explicit knowledge is generally accessible through controlled processing. This characteristic is in contrast with the automatic processing which characterizes the use of implicit knowledge. One of the mostly agreed views on uses of explicit knowledge is editing or monitoring production, a process which is just in those types of language use which allow sufficient time to learners to access the relevant declarative facts. It is the reason why explicit knowledge may not be readily present in spontaneous language use where the learners have little opportunity for on-line planning. Thus, L2 learners' grammatical accuracy will be significantly less in oral and written tasks when they are not given time to plan on-line. This is while learners in the careful planning conditions can obviously monitor their productions and use their explicit knowledge (Ellis, 2006).

As Ellis (2004) discusses, some learners can possibly proceduralize their explicit knowledge and access it for a rapid on-line processing in the same way as they access their implicit knowledge. According to DeKeyser (2003), the proceduralized explicit knowledge can be considered equivalent to implicit knowledge functionally. Hulstijn (2002) adopts a different position arguing that although practice may somehow make the execution of algorithmic rules faster, there must still be a distinction between the accessibility of implicit knowledge and the automatized explicit knowledge. In a similar vein, N. Ellis (1994) argues that sufficient practice or repeated activation can facilitate the automatization of the language sequences that are triggered and then constructed by the use or application of the declarative rules, and that the declarative rules will never become automatic themselves.

Any language task that a learner finds difficult may naturally result in an attempt to exploit explicit knowledge. According to Lantolf (2000), in sociocultural theory, explicit knowledge may be considered as a tool learners' use to reach self-control in linguistically demanding situations. According to this theory, explicit knowledge might appear in private speech which learners use to solve a problem. It means that if one asks learners to make or justify grammaticality judgments in a think-aloud or dynamic or problem-solving task, they try to access their declarative information if they lack sufficient confidence to make such a judgment intuitively (Ellis, 1991; Goss, Ying-Hua, & Lantolf, 1994).

Explicit knowledge is potentially verbalizable and stable because it is declarative in nature. Ellis (2004) further believes that an important point that should be regarded is that verbalizing a rule or feature does not entail the use of metalanguage. According to James and Garrett (1992, as cited in Ellis, 2004, p. 239), one can talk about language in a standard received language using much extensive metalanguage or in a non-technical way using just commonly-used words. Although metalanguage is not a necessary component of explicit knowledge, it seems to be very closely related. So, there is the possibility that if one can learn more metalanguage, his or her explicit knowledge will grow further, because an access to linguistic labels may sharpen one's understanding of linguistic constructs.

Linguistic knowledge is learnable at any age (Ellis, 2004). Ellis (2006) holds that whereas explicit knowledge is learnable at any age, implicit knowledge is not.

Similarly, Bialystok (1994, as cited in Ellis, 2004, p. 240) claims that explicit knowledge can be learned at any age but there are some age-related limitations or universal constraints on the ability of adult learners to completely learn an L2 implicitly because there have been only a few learners who have achieved native-speaker proficiency. Ellis (2004) adds that the constraints on learners' ability to learn implicit facts about a language are of a different order. They may be related to individual differences in their analytical skills which they need to memorize, deduce, and induce those facts. However, it would be possible that one can teach many learners a great amount of declarative information about a language.

Relationship between Implicit and Explicit Knowledge

Ellis (2005) argues that acquisition of an L2 includes the development of implicit knowledge, but there is not an agreement on how this is achieved and on the role of explicit knowledge. Traditionally, the relationship between the two types of knowledge has been discussed in terms of various 'interface' positions in Applied Linguistics. First, the non-interface position, researchers like Krashen (1981) and Hulstijn (2002) believe that implicit and explicit L2 knowledge involve different acquisitional mechanisms which are stored in different parts of the brain, (Paradis, 1994, as cited in Ellis, 2005, p. 144). They are accessed for performance by different processes automatic versus controlled processes (Ellis, 1993). This position has a pure form which rejects both the possibility that explicit knowledge directly transforms into implicit knowledge and also the possibility that implicit knowledge becomes explicit. This position has also a weaker form which asserts that the possibility of transformation of implicit knowledge into explicit can be recognized through conscious reflection on and through the analysis of the output generated by implicit knowledge (Bialystok, 1994, as cited in Ellis, 2005, p. 144).

Second, the strong-interface-position researchers (e.g., Sharwood Smith, 1981; DeKeyser, 1998) claim that explicit knowledge can be derived from implicit knowledge and also explicit knowledge can be converted into implicit knowledge through practice. According to this position then learners can first learn a rule as a declarative fact and then it will convert into an implicit representation through practicing the use of this rule, but it does not include loss of the original explicit representation.

Furthermore, the weak-interface position can be explained in three versions and all of them assert that there is the possibility of explicit knowledge becoming implicit but they impose some limitations on the time and the way this can take place (Ellis, 2005; Ellis et al., 2009). Ellis maintains that in the first version explicit knowledge can convert into implicit knowledge through practice, but it can take place only if the learner is developmentally ready to acquire the linguistic form. This version draws on notions of learnability (Pienemann, 1989) in accordance with the developmental sequences in the process of L2 acquisition. The second version argues that explicit knowledge indirectly contributes to the implicit knowledge acquisition through promoting some possible processes that are assumed to play a part in language development, for instance, making relevant features salient and helping learners 'notice the gap' between the input and their developing linguistic competence. The last version claims that learners can use their explicit knowledge in producing output that can in turn serve as 'auto-input' to their implicit learning mechanisms (Ellis, 2005; Ellis et al., 2009).

In a study on metalinguistic knowledge and language use in acquisition poor environments, Sorace (1985) investigated the development of metalinguistic knowledge and the relationship between knowledge and use of language on two groups of Italian students. She concluded that despite the lack of spontaneous practice of language, formal mastery of linguistic structures lead to the subjects' systematic application in a limited range of functions.

Green and Hecht (1992) also conducted a study on implicit and explicit grammar. They explored L2 learners and native speakers' performance on both general language proficiency tests and grammaticality judgment tests. The results of the study suggested that the ability of L2 learners for correcting the errors seemed to be considerably higher than their ability to verbalize the violated rules. Also, the learners who had learned the rules in the classroom performed relying on implicit knowledge and then they used their conscious rules. The researchers found that explicit rules of L2 learners constituted only a subset of their available implicit knowledge. Thus, they concluded that both learning explicit knowledge and using language communicatively may help individuals to develop the implicit rule system.

Additionally, Hu (2002) conducted a study of some Chinese learners of English to examine to what extent the explicit knowledge of the learners was available to use in the spontaneous writing. He found that when the learners used their correct metalinguistic knowledge, they were more accurate in the prototypical use of the six structures, and when they were aware of the need to attend to specific forms, they made fuller use of the metalinguistic knowledge. The results showed that the learners used the metalinguistic knowledge in the writing tasks.

As to the utility of the implicit/explicit distinction for explaining L2 grammatical knowledge and modeling general L2 proficiency, Ellis (2006) examined the extent to which the L2 proficiency can be properly understood in terms of the distinction of implicit and explicit grammatical knowledge. His findings first indicated that there exists a relationship between grammar scores and general proficiency scores. However, as far as the distinction is concerned, the implicit and explicit measures of the same structure were not both equally correlated with proficiency. That is, the implicit measures of one set of structures and the explicit knowledge of another set were found to relate to the IELTS measures. He thus concluded that the learning difficulty of the grammatical structures included in his study varied depending on whether one considers implicit or explicit knowledge of the structures.

A few other researchers (e.g., Han & Ellis, 1998; Elder & Ellis, 2009; Philp, 2009) have similarly shown interest in probing the relationship between the measures of implicit and explicit grammatical knowledge and different measures of general language proficiency currently used in different settings. Han and Ellis found that learners' scores on implicit and explicit grammatical knowledge correlated highly with their scores on the SLEP (i.e., Secondary Level English Proficiency Test) and the TOEFL (i.e., Test of English as a Foreign Language). Elder and Ellis's correlational analyses also demonstrated that the measure of explicit grammatical knowledge was only related to the L2 proficiency measures of both computer-based and internet-based TOEFL, whereas both implicit and explicit knowledge measures were found to be related to the IELTS, which is generally assumed to be more communicative. Although these studies seem to offer clear grounds to assume that grammar is an important component of any model of L2 proficiency and that the implicit/explicit distinction is equally important for understanding the nature of proficiency and the ability to measure it, it still needs further investigation why different measures of proficiency engage different types

of grammatical knowledge or involve differential amounts of these types of knowledge (Elder & Ellis). Further research is thus needed to explore this issue in different ESL/EFL contexts using different measures of implicit and explicit knowledge as well as different measures of L2 general proficiency also including a variety of learner factors such as starting age of instruction, length of instruction, length of years in an English-speaking country, type of instruction, and L2 use. This line of research helps see different findings in perspective and assess the importance and usefulness of the implicit/explicit distinction for modeling L2 learners' language proficiency, as argued by Ellis (2006) and Elder and Ellis.

The Study

As noted earlier, the present study focused on the differential accessibility of implicit and explicit L2 grammatical knowledge of EFL learners to their general language performance and the sub-components of their general L2 proficiency. The study addressed the following research questions.

1. Is there any significant relationship between the implicit and explicit grammatical knowledge of EFL learners and their general L2 proficiency?
2. Is there any significant relationship between the implicit and explicit grammatical knowledge of EFL learners and their sub-components of the general L2 proficiency?
3. Which type of grammatical knowledge, implicit or explicit, can significantly predict the general L2 proficiency of the EFL learners?

Participants

The participants in this study were 160 graduate and undergraduate students (76 male and 84 female), who were studying English as a foreign language (EFL) at Shahrekord University, Iran (aged 18 to 30). A total of 50 EFL learners were selected for test development and evaluation, 10 EFL learners participated in a pilot study, and the sample that was selected for the main part of the study (data collection) was made up of 100 EFL students from different semesters of study. All these students were native speakers of Persian, and none of them had any experience of being in an English-speaking country. They had already studied English as part of their curriculum in their secondary school and high school in Iran

before they entered university. The rationale behind sampling students from different educational levels (B.A. and M.A.) was to ensure that they had different L2 proficiency levels and the sample sufficiently represented the population of EFL students in that area of the country. The demographic information of the participants was also elicited through adding a part to the beginning of the tests. This part included their age, semester, gender, and a code or number that was supposed to be consistently used on all papers.

Instrumentation and Data Collection

The battery of tests that was used to elicit the data for the study is as follows: (i) Timed Grammaticality Judgment Test (Timed GJT), (ii) a Parallel Untimed Grammaticality Judgment Test (Untimed GJT), and (iii) the ETS TOEFL. It is worth noting that the tests were administered in a fixed sequential order to all the participants.

(i) The Timed GJT was administered to measure the implicit grammatical knowledge of the participants with twenty test items. The test was developed to assess the students' implicit knowledge of twenty English grammatical structures embedded in some contextualized minidiologues. It was designed originally following Ellis's (2004, 2006, 2009) guidelines receiving expert judgments and going through development and validation processes that will be explained below. The final draft was administered through the computer screen using timed power-point slides. The participants were required to select the correct sentence from among the two parallel grammatical and ungrammatical sentences within the time limit of 10 seconds for each slide. This time limit was set for each sentence based on a pilot test administration, by timing some students' performance on the sentences, calculating an average response time for each sentence, which was 10 seconds for each slide. The reliability of the test was estimated through the Cronbach's Alpha, which was found to be 0.69.

(ii) The Untimed GJT used the same L2 structures as the content or stimuli but had different prompt and response attributes with no time limit. This test was also administered to measure the explicit grammatical knowledge of the participants. The test was delivered in the written form. The participants were required to identify and correct the error in an ungrammatical sentence, and then explain the grammatical rule that was violated in each item. As to the scoring procedure for

each item, a half point (0.05) was assigned to the identification and the correction part and another half point for the explanation section of the test takers' responses. The reliability of the test was estimated through the Cronbach's Alpha, which was rather high, i.e., 0.80. Also to ensure the inter-rater consistency of the rule explanation part, the 'adjusted' inter-rater reliability estimate (using the Spearman-Brown Prophecy formula) for the two raters was satisfactory (i.e., 0.93) considering their depth of grammatical knowledge as advanced L2 users and the standardization meetings that had been held between them before the ratings.

The construct validity of these two tests was estimated through a Principal Components Analysis (PCA). After checking the initial Eigenvalues, the Screeplot, and the Parallel Analysis (using Monte Carlo PCA), it seemed optimal to retain a two-factor solution. This two-component solution explained a total of 45% of the variance, with Component 1 contributing 22% and Component 2 contributing 23%. To aid in the interpretation of these two components, Oblimin rotation was performed. The rotated solution revealed the presence of a simple structure (Pallant, 2007), with both components showing a number of strong loadings. The interpretation of the two components showed 20 items loading on Component 1 and 20 items loading on Component 2. The results of this analysis supported the use of the implicit knowledge test items and the explicit knowledge test items as independent instruments to tap into separate constructs.

(iii) An ETS TOEFL was also administered to measure the general L2 proficiency of the EFL learners. The test was composed of 140 items in three sections: (i) listening comprehension section with 50 test items; (ii) structure section with 40 items; and (iii) reading comprehension section with 50 items. The reliability estimate for the TOEFL was 0.88 using Cronbach's Alpha.

At first, the students were required to complete the Timed GJT, which was intended to measure the students' implicit grammatical knowledge. Then, the Untimed GJT was delivered to the students to measure their explicit grammatical knowledge of English. At last, the students' overall L2 proficiency was measured by administering the TOEFL test.

Results

The first research question addressed the relationship between the implicit and explicit grammatical knowledge of EFL learners and their general L2 proficiency. To begin with, the descriptive statistics of the three tests shown in Table 1 demonstrate that the distribution values of the test scores (i.e., skewness and kurtosis) are within the normal range of ± 1.5 proposed by Kinnear and Gray (1999).

Table 1
Descriptive statistics of the test scores

| Test | Mean | SD | Skewness | Kurtosis | Minimum | Maximum |
|--------------------|-------|-------|----------|----------|---------|---------|
| Implicit Knowledge | 11.19 | 3.27 | -.55 | -.37 | 5 | 20 |
| Explicit Knowledge | 13.6 | 5.05 | -.35 | -.41 | 4 | 20 |
| TOEFL | 39.72 | 16.98 | .64 | -.059 | 8 | 84 |

The relationship between the participants' implicit and explicit grammatical knowledge (as measured by the Timed and Untimed Grammaticality Judgment Tests) and their general L2 proficiency (measured by the TOEFL) was investigated through computing the Pearson product-moment coefficients using the SPSS 17. The correlation results are shown in Table 2.

Table 2
Correlations between implicit/explicit knowledge and general L2 proficiency

| Tests | Correlation | Sig. (2-tailed) | N |
|---|-------------|-----------------|-----|
| Implicit Knowledge & General L2 Proficiency | 0.11 | 0.274 | 100 |
| Explicit Knowledge & General L2 Proficiency | 0.519** | .000** | 100 |

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 indicates that there is no relationship between the scores of the EFL learners' implicit knowledge test and their general L2 proficiency scores, $r = 0.11$, $n = 100$, $p > 0.05$, but there is a strong relationship between the scores of the EFL learners' explicit knowledge test scores and their general L2 proficiency scores, $r = 0.519$, $n = 100$, $p < 0.0005$. The results imply that the grammatical explicit knowledge helps to explain nearly 35 per cent of the variance in students' scores on the TOEFL.

Table 3

Correlations between implicit and explicit grammatical knowledge and the sub-components of TOEFL

| TOEFL Sub-components | Implicit Test | Sig. | Explicit Test | Sig. | N |
|-------------------------|---------------|-------|---------------|-------|-----|
| Listening Comprehension | 0.152 | 0.131 | 0.373** | .000 | 100 |
| Structure | -0.018 | 0.857 | 0.369** | .000 | 100 |
| Reading Comprehension | 0.033 | 0.744 | 0.244* | 0.015 | 100 |

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 3 shows the results of the Pearson product-moment coefficients for the relationship between EFL students' implicit and explicit grammatical knowledge and the sub-components of their general L2 proficiency. This table shows that there is no relationship between the EFL learners' scores on the implicit grammatical knowledge test and their scores on the sub-components of the general L2 proficiency: listening comprehension ($r = 0.152$, $n = 100$, $p > 0.05$), structure ($r = -0.018$, $n = 100$, $p > 0.05$), and reading comprehension ($r = -0.018$, $n = 100$, $p > 0.05$). The results of the relationship between explicit knowledge test and the sub-components of the TOEFL in this table show that there is a medium relationship between the explicit grammatical knowledge test and the listening comprehension section of the TOEFL ($r = 0.373$, $n = 100$, $p < 0.0005$); between the explicit grammatical knowledge test and the structure section of the TOEFL ($r = 0.369$, $n = 100$, $p < 0.0005$); and between the explicit knowledge test and the reading comprehension section of the TOEFL ($r = 0.244$, $n = 100$, $p < 0.05$).

Considering the third research question, a Standard Multiple Regression was run to assess the ability of two independent variables (implicit and explicit grammatical knowledge) to predict the general L2 proficiency scores of EFL students, as the dependent variable (Table 4). The required preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity (Pallant, 2007).

Table 4
The results of model summary of standard multiple regression analysis

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------|----------|-------------------|----------------------------|
| 1 | 0.538 | 0.289 | 0.275 | 14.46 |

- a. Predictors: (Constant), Explicit Knowledge, Implicit Knowledge
b. Dependent Variable: General L2 Proficiency

Table 5
The ANOVA results of standard multiple regression analysis

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|----|-------------|-------|------|
| 1 Regression | 8267.493 | 2 | 4133.74 | 19.75 | .000 |
| Residual | 20300.667 | 97 | 209.28 | | |
| Total | 28568.160 | 99 | | | |

According to Table 5, 29 per cent of the variance in participants' general L2 proficiency is explained by the model as a whole including both explicit and implicit L2 grammatical knowledge. So, it is a respectable model which can predict the results. Further, the ANOVA results in Table 5 demonstrate that the model reached the statistical significance (Sig. = .000, $p < 0.0005$) and can explain a significant part of the variance in the dependent variable.

Table 6
The results of standard multiple regression analysis

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | | | |
|--------------------|-----------------------------|------------|---------------------------|-------|------|-------------------------|------|-----------|-------|
| | B | Std. Error | Beta | | | Partial | Part | Tolerance | VIF |
| 1 (Constant) | 9.931 | 7.165 | | 1.386 | .169 | | | | |
| Implicit Knowledge | .733 | .445 | .141 | 1.649 | .102 | .165 | .141 | .997 | 1.003 |
| Explicit Knowledge | 1.771 | .288 | .527 | 6.152 | .000 | .530 | .527 | .997 | 1.003 |

Dependent Variable: General L2 Proficiency

Table 6 depicts which independent variable (i.e., explicit and implicit grammatical knowledge) contributed more significantly to the dependent variable (general L2 proficiency). An inspection of the beta column related to the explicit and implicit knowledge indicates that the beta value (0.527) of explicit L2 grammatical knowledge was significantly higher than that of the implicit grammatical knowledge. Therefore, it is argued that the participants' explicit L2 grammatical knowledge has made a significantly higher contribution to the dependent variable in the model, that is, their general language proficiency. Further investigation of the table implies that if the participants' explicit L2 grammatical knowledge test scores increase by one standard deviation (i.e., 5), their general L2 Proficiency scores would be likely to increase by 0.527 SD units (i.e., 2.635), but the EFL learners' implicit grammatical knowledge could not predict their general L2 proficiency.

Discussion

As mentioned above, this study probed the relationship between EFL learners' implicit and explicit grammatical knowledge and their general L2 performance. The results revealed that there was no relationship between the implicit grammatical knowledge of EFL learners and their general L2 proficiency. In other words, in the EFL context under study, the EFL students' implicit grammatical knowledge does not play a significant part in their performance on the TOEFL as the measure of general L2 proficiency. This finding ran counter to the rather strong

relationship that Elder and Ellis (2009) found between a measure of implicit knowledge and the test takers' performance on the IELTS as one of the three measures of general L2 proficiency they used in their study. Yet, this finding here was in a way similar to Elder and Ellis's finding, as far as the TOEFL (both computer-based and internet-based) scores are concerned; that is, even in their study, EFL students' implicit L2 grammatical knowledge was not very strongly correlated with their scores on the TOEFL. Furthermore, the correlation analysis of the relationship between the implicit grammatical knowledge of EFL learners and the sub-components of their general L2 proficiency indicated no meaningful relationship. In Elder and Ellis' study, implicit knowledge correlated with all four language skills, and even more strongly with the oral IELTS.

However, the learners' performance on the measure of explicit L2 grammatical knowledge was significantly correlated with their performance on the TOEFL. This finding thus supports the earlier findings of Ellis (2006) as well as Elder and Ellis (2009) that there was a fairly strong relationship between the explicit grammatical knowledge of L2 learners and their general language proficiency. Moreover, this study showed a nearly respectable relationship between explicit grammatical knowledge of EFL learners and the TOEFL sub-components. That is, those L2 learners who had performed better on the explicit grammatical knowledge test had also performed well on the listening comprehension, structure, and reading comprehension sub-tests. These findings were to some extent similar to the findings of a study by Macrory and Stone (2000). They investigated some students from British secondary schools and found a significant relationship between their explicit knowledge about the French perfect tense and their ability to use the tense in an informal interview and in their free written production. They concluded that the learners who had a nearly good explicit knowledge of this perfect tense also performed well in the productive skills under study. Partially similar to this finding, Ellis and Elder and Ellis found that the learners' explicit knowledge was strongly related to written IELTS.

It stands to reason that the type of proficiency test (TOEFL as opposed to IELTS) plays a pivotal role in explaining such contradictory findings obtained when examining the involvement of the implicit or explicit grammatical knowledge in the L2 learners' performance on general proficiency instruments. In other words, it can be argued that TOEFL is a monologic test allowing more for monitoring and thus the implication of explicit grammatical knowledge, whereas IELTS is more

interactional or communicative and is presumed to bring much more to bear on the learners' implicit knowledge. Therefore, TOEFL, despite its renewed design and form, is still generally envisioned to tap primarily into the cognitive academic language proficiency and in turn encourage the use of explicit knowledge (Elder & Ellis, 2009).

The last finding of this study was that, in comparison to the L2 learners' implicit grammatical knowledge, the participants' explicit grammatical knowledge was a better predictor of their general proficiency in an EFL context. It suggests that the EFL learners' scores on the measures of explicit grammatical knowledge can be proportionately used to predict their scores on the general L2 proficiency. Considering the accessibility of the explicit knowledge to the learners' general proficiency, the results corroborated with the conclusion made by Ellis (2006) and Elder and Ellis (2009) that knowledge of grammar serves as a powerful predictor of general proficiency. The results, however, did not confirm the researchers' finding that L2 learners' implicit knowledge is also implicated in language proficiency since the learners' implicit grammatical knowledge did not significantly contribute to their performance on the TOEFL. Elder and Ellis further argue that implicit and explicit knowledge of different rather than the same structures functions as predictors of overall proficiency. Still, when it comes to the components of the IELTS, it is either the explicit feature or the implicit feature that emerged differentially as significant predictors of receptive vs. productive skills or input vs. output processing, respectively. Despite these apparently irreconcilable findings, it is suggested that the use of other measures of implicit knowledge such as 'elicited oral imitation test' and observation of real-time oral output by future research might help portray the accessibility of implicit knowledge to language proficiency more clearly.

A final point in order, as noted earlier, different competing 'interface positions' have been adopted in the field of SLA on the role of explicit and implicit knowledge in L2 acquisition and have been explored by different researchers (Ellis, 2004, 2005; Hu, 2002; DeKeyser, 1997; Bialystok, 1982). It seems that the results of the present study imply that the knowledge more accessible to EFL learners in their L2 use and processing, especially in their general language proficiency and input processing, is fundamentally explicit in terms of its origin or architecture. Even though this issue needs further investigation, the findings are apparently in line with the weak interface position versions that argue for the possibility of

knowledge transfer from one system to the other while putting some restrictions on when and how it can take place (Ellis, 2005).

As to the pedagogical implications of the study, the findings recognize the importance of explicit knowledge in language learning especially in EFL settings. This recognition in turn motivates a renewed interest in explicit instruction embedded within a FonF pedagogical milieu, where meaning and form receive collateral momentum. Learners' errors while communicating to perform tasks or play roles should occasionally trigger the teachers' explicit reformulations and explanations of correct grammatical structures and helping the learners notice the gap in their grammatical knowledge (Ellis, 1990, 1991; N. Ellis, 2001, 2002). In other words, if the students' scores on explicit grammatical knowledge increase, their scores on (the oral and written skill components of) the TOEFL as well as the written IELTS will increase as well. It may be argued that, the most important insight that can be gained from this study is that, a balanced approach needs to be adopted by L2 teachers in English classrooms between the time devoted to the development of L2 learners' explicit grammatical knowledge through teaching explicit rules and the time specialized to the real communicative use of L2, which can help the development of both the EFL learners' implicit knowledge and their general L2 proficiency.

Conclusion

This study is added to the growing body of L2 research on the relationship between the L2 learners' implicit and explicit grammatical knowledge and their general language proficiency. The results indicated that the EFL learners' scores on the measure of explicit grammatical knowledge correlated significantly with their scores on the TOEFL, whereas their scores on the measure of implicit grammatical knowledge were not significantly related to their TOEFL scores. Furthermore, no relationship was found between the L2 learners' implicit grammatical knowledge and their performance on the TOEFL components, but a significant relationship was found between the explicit grammatical knowledge of the learners and their performance on all the language proficiency components. In short, it was found that the learners' explicit grammatical knowledge could better predict their performance on the TOEFL and its components. The findings indicated that there are clear reasons for believing that grammar is an important component of any model of L2 proficiency and that the implicit/explicit distinction may also be

important for understanding the nature of proficiency and the ability to measure it (Ellis, 2006).

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Appendices

Appendix A: Implicit Grammatical Knowledge Test

University: Major: Semester: Age:
Gender:

Instruction: Choose the correct choice (either *a* or *b*) within the fixed time limit set for each slide (i.e., 10 seconds).

Example:

A. What do you usually do on Fridays?

B.

a) I often going to the cinema.

b) I often go to the cinema.

1) A. How's the whether there?

B.....

a) It's nice.

b) It's a nice whether.

2)

a) They seldom don't go to the movies.

b) They seldom go to the movies.

3)

a) Why is Tom not worried?

b) Why is Tom no worried?

- 4)
- a) Tom is a careful driver.
 - b) Tom is a carefully driver.
- 5)
- a) I asked her whether could she read before she started school.
 - b) I asked her whether she could read before she started school
- 6) A. What is this? B.
- a) It is the book I wanted you to read.
 - b) It is the book I wanted you to read it.
- 7) A. Are you sitting down? B.
- a) Yes, I sit.
 - b) Yes, I am.
- 8) A. How is her swimming? B.
- a) She can certainly swim a lot fastest than I can.
 - b) She can certainly swim much faster than I can.
- 9) A. They're really good friends.
- B.
- a) Yes, they have been in the same class for the past three years.
 - b) Yes, they were in the same class for the past three years.
- 10)
- a) The window was repaired by the landlord.

b) The window repaired by the landlord.

11)

a) She said that she didn't mind to wait well until we got back.

b) She said that she didn't mind waiting well until we got back.

12)

a) This is the city where George Washington lived.

b) This is the city where George Washington was living.

13) A.?

B. No, you have to guess it yourself.

a) Can you explain me this word?

b) Can you explain this word for me?

14) A.? B. At 9 o'clock.

a) What time is the news on the television?

b) What time are the news on the television?

15) A.?

B. Yes, it tastes delicious.

a) Is the fish enough cooked?

b) Has the fish been cooked enough?

16) A. Where is Jim? I don't see him these days? B.

.....

a) He has gone to Japan.

b) He has gone to the Japan.

17) A. ? B. Art and architecture.

a) What are you interested with?

b) What are you interested in?

18) A. He seems not to be feeling well. B.

a) Yes, he has been working such hard that he has made himself ill.

b) Yes, he has been working so hard that he has made himself ill.

19)

a) It was near end of prehistoric times that the first wheeled vehicles appeared.

b) It was at the end of prehistoric times that the first wheeled vehicles appeared.

20) A. The book is really interesting. B.

a) It is really worth reading.

b) It is really worth read.

Appendix B: Explicit Grammatical Knowledge Test

University: Major: Semester: Age:

Gender:

Instruction: For each number below: 1) Underline the grammatically incorrect word(s) in the minidiologue, 2) Write its correct form, and 3) State the grammatical rule that has been broken.

Example: A. What do you usually do on Fridays?

B. I often goes to the cinema.

Correct form: go

Rule: *The verb must agree with the subject. 'I' is the first person singular subject, but 'goes' agree with a 3rd person singular subject.*

1) A. How's the whether there?

B. It's a nice whether.

Correct form:

Rule:

2) A. They seldom don't go to the movies.

Correct form:

Rule:

3) A. Why is Tom no worried?

B. He lost his keys yesterday.

Correct form:

Rule:

4) A. Tom is a carefully driver.

Correct form:

Rule:

5) A. I asked her whether could she read before she started school.

Correct form:

Rule:

6) A. What is this?

B. It is the book I wanted you to read it.

Correct form:

Rule:

7) A. Are you sitting down?

B. Yes, I sit.

Correct form:

Rule:

8) A. How is her swimming?

B. She can certainly swim a lot fastest than I can.

Correct form:

Rule:

9) A. They're really good friends.

B. Yes, they were in the same class for the past three years.

Correct form:

Rule:

10) A. The window repaired by the landlord.

Correct form:

Rule:

11) A. She said that she didn't mind to wait well until we got back.

Correct form:

Rule:

12) A. This is the city where George Washington lived.

Correct form:

Rule:

13) A. Can you explain me this word?

B. No, you have to guess it yourself.

Correct form:

Rule:

14) A. What time are the news on the television?

B. At 9 o'clock.

Correct form:

Rule:

15) A. Is the fish enough cooked?

B. Yes, it tastes delicious.

Correct form:

Rule:

16) A. Where is Jim? I don't see him these days?

B. He has gone to the Japan.

Correct form:

Rule:

17) A. What are you interested with?

B. Art and architecture.

Correct form:

Rule:

18) A. He seems not to be feeling well.

B. Yes, he has been working such hard that he has made himself ill.

Correct form:

Rule:

19) A. It was near end of prehistoric times that the first wheeled vehicles appeared.

Correct form:

Rule:

20) A. the book is really interesting.

B. It is really worth read.

Correct form:

Rule:

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