New Academia: An International Journal of English Language, Literature and Literary Theory

(E-ISSN 2347-2073) (U.G.C. Journal. No. 44829) Vol. VII Issue I, Jan. 2018

IMPLICIT AND EXPLICIT MODEL OF SECOND LANGUAGE ACQUISITION: A STUDY

Dr. Sachin Vaman Londhe
Assistant Professor
K. N. Bhise Arts, Commerce and Vinayakrao Patil Science College,
Bhosare (Kurduwadi)
londhesan1729@gmail.com

Abstract

The present article seeks to study the Implicit and Explicit model of SLA devised and implemented by number of scholars in the field of Second Language Acquisition. The distinction concerning Implicit/Explicit Learning and Knowledge is initiated in Cognitive Psychology and it is studied accordingly. According to Anderson (1980:7) Implicit Language Learning takes place without intention and awareness, and Explicit Language Learning takes place with intension and awareness. There are seven dimensions which are used to distinguish Implicit and Explicit Knowledge. The differences between Implicit and Explicit Learning, Implicit and Explicit Knowledge are all related to what has been called the 'interface issue'.

Key Words: SLA, Cognitive Psychology, Implicit, Explicit learning and Knowledge etc.

The distinction concerning Implicit/Explicit Learning and Knowledge is initiated in Cognitive Psychology and it is studied accordingly. The goal of cognitive psychology is to understand the nature of human intelligence and how it works in us (Anderson: 1980: 4). In the Western Civilization, interest in human cognition can be traced back to the ancient Greeks. Plato and Aristotle, in their discussions of the nature and origin of knowledge, pondered on the nature of 'memory' and 'thought'. These early discussions on the nature of knowledge were philosophical in nature and finally turned into a centuries-long debate. There were two positions regarding the origin of the knowledge. The empiricists, the antagonists of Cognitive Psychologists, believed that the source of all knowledge is experience, and the nativists, or rationalists, argued that children come into the world with a great deal of knowledge. The debate reached to its height during the seventeenth, eighteenth and nineteenth centuries. British philosophers like Locke, Hume and Mill favoured the empiricist view and continental philosophers like Descartes and Kant favoured the nativist view.

Though these arguments were core at their philosophical level, they frequently slipped into psychological speculations about human cognition (Anderson: 1980: 6).

According to Anderson (1980:7) Cognitive Psychology, like many other sciences, did not make progress because of egocentric, mystical and confused attitude of the people about themselves and their own nature. Till the 19th century, it was unbelievable that the workings of the human mind could be analyzed scientifically. As a result, Cognitive Psychology as a science is only 100 years old and therefore lags far behind from other sciences in sophistication.

Anderson states that there are three main influences which contribute to the development of modern Cognitive Psychology (Anderson: 1980: 8-10). They are as follows:

1. Information Processing Approach- This approach is grown out of human-factors work (human skills and performance) and information theory.
2. Developments in computer science-The developments in computer science made indirect influence on modern development of Cognitive Psychology. A number of concepts have been taken from computer science and used in psychological theories.
3. Linguistics – During the 1950s, Chomsky began to develop a mode of analyzing the structure of language.

Cognitive psychologists show the difference between Implicit and Explicit Learning in two major ways:

1. In the process of Implicit Learning there is no demand of central attention. As N. Ellis (2008: 125) puts it, 'generalizations arise from conspiracies of memorized utterances collaborating in productive schematic linguistic productions'. It takes place unconsciously and the resulting knowledge is subsymbolic (it is not represented in explicit form), reflecting statistical sensitivity to the structure of the learned material (Ellis. R, 2009: 3). On the contrary in the process of explicit learning there is a heavy demand on working memory and it requires remembering facts. It takes place consciously and the resulting knowledge is symbolic in nature (Ellis. R, 2009: 3).
2. In the process of Implicit Learning learners are unaware about the learning when it takes place. However, it is seen in the behavioural responses of the learner. Thus learners cannot articulate what they have learned. On the other hand, in explicit learning learners are aware of the learning when it takes place and they can voice the learned content/ material (Ellis. R, 2009: 3).

There is a controversy in cognitive psychology regarding the independent existence of Implicit and Explicit learning systems. This controversy is seen in a collection of papers addressing the role of consciousness in learning (Jimenez, 2003). Shanks (2003) states that

there was no convincing evidence that shows Implicit Learning is functionally or neurally separate from Explicit Learning and that it was misguided to look for such dissociation. He proposed an alternative view that there is a single knowledge source that underlies performance and the apparent differences in performance are due to 'subtle differences between the retrieval processes recruited by the tests' (p. 36).

Nick Ellis's in his edited book *Implicit and Explicit Learning of Languages* (1994) advocates the importance of the Implicit/Explicit distinction for Language Learning (both first and second). In the introduction, Ellis gives in the simplest way the distinction between Implicit and Explicit Learning:

> Some things we just come able to do, like walking, recognizing happiness in others, knowing that *'th'* is more common than *'tg'* in written English, or making simple utterances in our native language. We have little insight into the nature of the processing involved; we learn to do them implicitly like swallows learn to fly. Other of our abilities depend on knowing how to do them, like multiplication, playing chess, speaking pig Latin, or using a computer programming language. We learn these abilities explicitly like aircraft designers learn aerodynamics. (Ellis. N, 1994: 1)

When the researchers in SLA realise that the distinction can be made between Implicit and Explicit Learning of an L2 and between Implicit and Explicit L2 Knowledge, they have focussed on identifying the processes involved in the two types of learning, how they interact, and how they can be externally manipulated through instruction (2009: 6).

Rod Ellis assumes that Implicit/Explicit Learning and Implicit/Explicit Knowledge are related but as they are distinct concepts so they need to be separated. Implicit/Explicit Learning is related to the processes involved in learning and Implicit/Explicit Knowledge is related with the products of learning. He says that it is possible that learners will think on the knowledge that they have acquired implicitly (i.e. without metalinguistic awareness) and then develop an Explicit representation of it. He further says that it is also possible that Explicit Learning focussed at one linguistic feature may result in the incidental implicit learning of some other linguistic feature. In the case of SLA, implicit and explicit learning have been examined by the product of learning i.e. L2 knowledge gained by the learners. For this reason, the present study focuses on 'knowledge' rather than 'learning'.

Moreover, the distinction between Implicit and Explicit L2 Knowledge has been included in information-processing model. This model views knowledge as related to, but independent of, language use. It is acquired when learners engage in active processing of the L2 input they are exposed to. They reflect on the knowledge in gradual and dynamic way and build their interlanguages. The important processes involve here are those concerning to

attention to form (i.e. noticing and noticing-the-gap), rehearsal in short term memory, integration into long-term memory and monitoring (Ellis 2008).

Schmidt also states that learning has to be differentiated from instruction. According to him, implicit instruction may not result in implicit learning and explicit instruction may not lead to explicit learning. Teachers might hope that implicit instruction leads to implicit learning and explicit instruction leads to explicit learning, but learners have their individual minds and they may follow their own inclinations, irrespective of the nature of the instruction they receive (Allwright, 1984).

In the following section three distinctions are discussed: (1) Implicit and Explicit Learning, (2) Implicit and Explicit Knowledge and (3) Implicit and Explicit instruction. This helps to understand the nature of the relationship between Implicit and Explicit Knowledge.

2.1 Implicit and Explicit L2 Learning

As stated earlier Implicit Language Learning takes place without intention and awareness. But there is a disagreement regarding whether any learning is possible without some degree of awareness. This leads to the important question about the meaning of 'awareness'. To reach to the exact meaning of awareness, Schmidt (1994, 2001) distinguishes it into two types: (1) awareness as noticing, and (2) metalinguistic awareness. Awareness as noticing involves perception and conscious attention to 'surface elements' and metalinguistic awareness consists of analysis and awareness of the underlying abstract rule that governs particular linguistic phenomena. According to Schmidt, there is at least some degree of awareness in noticing. Thus, complete implicit learning is impossible. Further he says that Implicit Language Learning might be 'learning without any metalinguistic awareness'. Williams (2005) also states that learning without awareness at the level of noticing can take place. N. Ellis (2005: 306) also claims that 'the vast majority of our cognitive processing is unconscious'. Thus, there is no general agreement regarding the definition of Implicit Learning; however many theorists agree that Implicit Learning excludes metalinguistic awareness.

N. Ellis (1994: 1) states that Explicit Language Learning is a conscious process and it is intentional. It is conscious learning 'where the individual makes and tests hypotheses in a search for structure'. According to Hulstijn (2002: 206) Explicit Learning is a conscious, deliberative process of concept formation and concept linking.

As discussed earlier, the study of implicit and explicit learning in SLA is based on cognitive psychology. The study of Reber (1993; Reber et al., 1991) is significant in this respect. The important conclusions of the studies are: (1) there is clear proof of Implicit Learning; (2) the test scores of the Implicit and Explicit Learning groups regarding simple

rules are similar, however in terms of complex rules Implicit Learning confirmed more efficient; and (3) it is proved that there is much greater individual variation in the test scores of the explicit group than those of the implicit group. Thus, it becomes clear that analytical skills are significant in Explicit Learning whereas in Implicit Learning they are not.

As stated earlier, there is a disagreement among cognitive psychologists regarding the claim that Implicit and Explicit Learning are distinct from each other. There is also a controversy regarding the nature of knowledge that comes out of Implicit Learning. Some argue that it consists of knowledge of fragments or exemplars, and others argue that it is rule-based (Ellis, R. 2009: 8).

In SLA, like in cognitive psychology, the major issue is whether Implicit Learning, i.e. learning without consciousness, of an L2 can take place. This issue is discussed in a number of studies. DeKeyser (2003: 317) has summarized the results of such studies and states that there is very little evidence of learning without awareness. However, N. Ellis (2005) argues differently and says that frequency effects in L2 acquisition can only be explained if it is assumed that learning without awareness is possible (Ellis, R. 2009: 9).

According to Rod Ellis, the studies which compare Implicit and Explicit Learning have problems. The two types of learning have not been operationalized and measured in similar ways. The studies of Doughty (1991), Shook (1994), and Gass (2003) have proved that some kind of implicit learning which is intended by the researcher takes place. However, they do not demonstrate whether the learners actually engaged in Implicit Learning. It is very easy to prove the Explicit Learning by asking learners to verbalize what they have learned. A number of studies examined the relative effectiveness of Implicit and Explicit Learning. The general finding of the studies of Nick Ellis (1993), Rosa and O'Neill (1999), and Gass (2003) is that Explicit Learning is more effective than implicit learning. Even a single study does not prove that Implicit Learning worked better than explicit learning. However, the studies of Doughty (1991) and Shook (1994) found no difference between Implicit and Explicit Learning. There is also some evidence to suggest that Explicit Learning is more effective with some linguistic features than others. In his study, Robinson (1996) states that explicit learners gave better performance than the implicit learners when they were asked to respond to the simple structure (subject-verb inversion), However, they did not, when they were exposed to the complex structure (pseudo-clefts). Gass et al. (2003), in their study, find that focused condition of the explicit learners' demonstrated more effective than their unfocused condition in the case of lexis than it did in the case of morphology or syntax.

Rosa and O'Neill (1999) found that learners who proved high awareness during learning performed better than those of with low awareness. Both N. Ellis (1993) and Robinson (1996) examined the learners' ability to verbalize the rules they were learning, but

they come up with different results. N. Ellis found that the explicit learners in his study were able to verbalize the rule, whereas Robinson found that very few learners could verbalize the rules, although in the case with simple rules the explicit learners performed better than the rest. Therefore, it becomes clear that there is some evidence of Implicit L2 Learning and much clearer evidence of Explicit Learning. However, according to Rod Ellis (2009: 10) there are two reasons to reserve judgement. First, the studies referred above were all of short duration that is why they create a prejudice against Implicit Learning. Second, the test (e.g. grammaticality judgement tests) devised to measure the effects of the training was likely to favour Explicit Learning.

2.2 Implicit and Explicit L2 Knowledge

Before talking about Implicit and Explicit L2 Knowledge, it is essential to know the meaning of the phrase 'linguistic knowledge'. There are two positions regarding linguistic knowledge. The first position, based on the works of Chomsky, claims that linguistic knowledge consists of knowledge of the features of a specific language, which are derived from impoverished input (positive evidence) with the help of Universal Grammar (UG). This view of language is innatist and mentalist in orientation. It emphasizes the contribution of a complex and biologically specified language element in the mind of the learner. The second position, which is based on connectionist theories of language learning, is advanced by cognitive psychologists such as Rumelhart and McClelland. They (1986), view linguistic knowledge as comprised of an elaborate network of nodes and internode connections of varying strengths that dictate the ease with which specific sequences or 'rules' can be accessed (Ellis, R. 2009: 10). These positions are generally presented as opposite to one another (e.g. Gregg, 2003), but in one important respect, they are in agreement. Both the innatist and connectionist view linguistic competence as consisting primarily of Implicit L2 Knowledge and see the goal of linguistic theory as explaining how this Implicit Knowledge is acquired. However, they differ in the importance they attach to Explicit Knowledge. (Ellis, R. 2009: 11).

Rod Ellis has attempted to identify the criteria that can be used to distinguish Implicit and Explicit L2 knowledge. There are seven dimensions which are used to distinguish Implicit and Explicit Knowledge. They are divided into two broad categories. One of them is 'representation dimensions' and other is 'processing dimensions'. The representation dimensions involve (a) Awareness, (b) Type of knowledge, and (c) Systematicity and certainty of L2 knowledge. The processing dimensions include (a) Accessibility of knowledge, (b) Use of L2 knowledge, (c) Self report and (d) Learnability.

2.2.1 Representation dimensions:

1. **Awareness:** There are two kinds of awareness, the unconscious awareness and the conscious one. Karmiloff-Smith gave the distinction between them for the first time in 1979. According to him, unconscious awareness is connected with epilinguistic behaviour. It means, one is able to recognise whether a sentence is grammatical or ungrammatical immediately, but s/he may not know why a given sentence is grammatical or ungrammatical and at the same time s/he may not know the grammatical rule that has been broken. Unconscious awareness is active in Implicit Knowledge and conscious awareness is active in Explicit Knowledge. Conscious awareness is associated with metalinguistic behaviour. One can explain why a given sentence is incorrect and provide the grammatical rule that has been violated (Ellis 2006:433).
2. **Type of knowledge:** It is the second dimension which represents the difference between Implicit and Explicit Knowledge. Explicit Knowledge is like declarative knowledge and Implicit is like procedural knowledge. Declarative knowledge is encyclopadaedic in nature as far as grammatical features are concerned. Explicit Knowledge consists of a number of facts and rules concerning a given language. Procedural knowledge is easily accessible and one can easily write or correct a sentence. It is activated very quickly without even thinking about the grammatical structure (Ellis 2006:433).
3. **Systematicity and certainty of L2 Knowledge:** According to Tarone (1982) (quoted in Ellis2006:433), once Implicit Knowledge is established in a learner's interlanguage, it becomes very systematic. Sorace (quoted in Ellis 2006: 433) says Explicit Knowledge tends to be imprecise, inaccurate and inconsistent. Ellis writes that Implicit Knowledge may be more structured than Explicit Knowledge and thus held with greater certainty. Zobl (1995) suggested that this difference will be clearly seen in the results of test used to measure L2 Knowledge.

2.2.2 Processing dimensions:

1. **Accessibility of Knowledge:** It concerns with the time needed to access Implicit and Explicit Knowledge when it is necessary. In the year 2002, Preston suggested that all L2 learners use two different types of grammar knowledge. One is deeply embedded and other resides more on the surface. According to Ellis (2006), first one is Implicit Knowledge and second one is Explicit Knowledge. Therefore, it means that deeply embedded (Implicit) Knowledge can be processed automatically and more on the surface (Explicit) Knowledge can be processed in much more controlled way.

However, all researchers do not agree with the way Implicit and Explicit Knowledge is accessed. Hulstijn (2002) suggests that even though it may be possible to speed up the processing of Explicit Knowledge through practice there remains a fundamental difference between automated Explicit Knowledge and Implicit Knowledge. In contrast, DeKeyser (2003) argues that there is no functional difference between automated Explicit Knowledge and Implicit Knowledge (quoted in Ellis 2006: 433).

2. **Use of L2 Knowledge:** The situation in which learners are asked to perform task affects the learners' use of knowledge. It is proved that if an intermediate learner gives a lot of time to think about what to say, how to structure his/her sentence/utterance, his/her speech becomes more accurate. The reason for this result is that if a learner is given a lot of time s/he gets access to Explicit Knowledge. And when the same learner is not given enough time and pressured to complete the task rapidly, his/her speech becomes less accurate and s/he uses Implicit Knowledge.
3. **Self Report:** It refers to the capacity of a learner to justify the words and grammatical constructions s/he has used. In his study, Butler (2002) states that all Japanese adults learning English gave an explanation for the choice of articles in a close task. They were able to tell whether the given sentence is correct or incorrect and simultaneously they can explain the grammatical rules, but often in non-technical language. However it is to be remembered that Implicit Knowledge cannot be verbalised and to verbalise any rule one has to form an explicit rule. This leads to the conclusion that self report is formed by using Explicit Knowledge (Ellis 2006: 434).
4. **Learnabilty:** The point of learnabilty is very significant. It is believed that one can learn L2 explicitly at any age. On the other hand, Implicit Learning can only take place when the subject is young (Ellis 2006: 434). Munzo (2007) claimed that older learners learn explicitly better than young ones. However, Bialystok (1994) claims that 'Explicit Knowledge can be learned at any age', but that there are age-related limitations on L2 learners' ability to learn. Krashen (1982) also argues that most learners are capable of learning only formally and functionally simple rules as Explicit Knowledge.

2.2.3 Distinctness of L2 Implicit and Explicit Knowledge

This issue is also important to know to what extent a learner's L2 Implicit and L2 Explicit systems are distinct. Krashen (1981) states that the two types of knowledge as entirely separate. Paradis (1994: 397, 2004) also claims that the two types of knowledge reside in neuranatomically distinct systems. Explicit memory is stored diffusely over large areas of the tertiary cortex and involves the limbic system; implicit memory is 'linked to the

cortical processors through which it is acquired' and does not involve the limbic system. The two memory systems are also susceptible to selective impairment. Paradis cites evidence to suggest that bilinguals who have learnt the L2 formally may lose the ability to use their L1 in the case of aphasia while maintaining the ability to speak haltingly in the L2 (Ellis 2009: 14)

Based on his dual-mechanism model, Ullman (2001) proposes the dual mechanism model of brain and the two types of knowledge can be found in two independent mechanisms. According to him, brain is so organised that it supports a mental model which consist of two largely separate systems: the lexicon and the grammar each with distinct neural bases.

He explains this model with reference to the processing of morphological forms such as regular and irregular past-tense verb. He proposes that procedural memory permits the computation of regular morphological features (e.g. V-ed) by connecting the phonological forms of the base and an affix (e.g. walk -ed ? walked). In contrast, declarative memory handles irregular forms. Ullman (2001: 39) suggests that 'for a given morphosyntactic configuration, both systems attempt to compute an appropriatel complex form', but 'if a form is found in memory (sang), the rule-based computation is inhibited'.

Dienes and Perner (1999) view the distinction between Implicit and Explicit Knowledge as continuous rather than dichotomous. Bartke et al. (2005) finds that differences in brain responses are dependent on whether the stimulus was a complete irregular or a subregular form and suggests that the dual-mechanism account proposed by Ullman needs to be modified to incorporate a third processing component to explain how the brain processes subregular forms.

Ellis (2004) also opines that where representation (but not language use) is concerned, one would do better to view the two types of knowledge as dichotomous.

2.2.4 Utilization of both Implicit and Explicit Knowledge in L2 performance

The problem in determining whether Implicit and Explicit Knowledge stores are separate or linked rests in part, at least, on the problem of determining precisely how learners draw on their linguistic knowledge when performing different language tasks. As Bialystok (1982) pointed out, language use typically involves learners drawing on both systems to construct messages. Furthermore, it is possible that learners have developed both Implicit and Explicit Knowledge of the same linguistic feature. For example, a learner may have internalized 'jumped' as a single item in explicit memory, but may also have developed the procedure for affixing -ed to the base form of the verb in implicit memory as suggested by Ullman. Thus, the neurological distinctiveness of the two systems will be difficult to detect

from simply examining a learner's linguistic behavior. This is a problem for the measurement of the two types of knowledge. The point at issue now is that irrespective of whether the two systems are psychologically and neurologically distinct, they are never entirely distinct in performance.

Following are the main points that have emerged from this discussion of Implicit and Explicit L2 Knowledge: (Ellis, R. 2009: 16)

(1) Explicit Knowledge appears phylogenetically and ontogenetically later than Implicit Knowledge and it involves different access mechanisms.

(2) Explicit Knowledge is neurologically distinct from implicit knowledge.

(3) The question of whether the two types of knowledge are to be seen as dichotomous or continuous is a matter of controversy; but neurological evidence and current connectionist models of linguistic knowledge point to a dichotomy.

(4) The question of the separateness of the representation of the two types of knowledge is independent from the question of whether the processes of Implicit and Explicit Learning are similar or different. This remains a controversial issue. It is likely, however, that learning processes and knowledge types are correlated to some degree at least.

(5) While there is controversy regarding the interface of Explicit and Implicit Knowledge at the level of learning, there is wide acceptance that they interact at the level of performance.

2.4 The Interface Issue

The differences between Implicit and Explicit Learning, Implicit and Explicit Knowledge and Implicit and Explicit Instruction are all related to what has been called the 'interface issue'. The interface issue deals with a number of questions: to what extent and in what ways are Implicit and Explicit Learning related? Does Explicit Knowledge convert into or helps the acquisition of Implicit Knowledge? Does Explicit Instruction result in the acquisition of Implicit as well as Explicit Knowledge? These are the significant questions of both theoretical importance for SLA and practical importance for language pedagogy. Three very different responses to the interface question have been offered: (1) the non-interface position, (2) the strong interface position and (3) the weak interface position (Ellis 2009: 20, 21).

2.4.1The non-interface position

According to this position the Explicit Knowledge cannot be converted into Implicit Knowledge, and vice versa. The position supports the view that Implicit and Explicit Knowledge reside in different parts of the brain and they are accessed in different ways. Implicit Knowledge is accessed automatically but Explicit Knowledge is in a controlled way.

However, according to the weak non-interface position the possibility of Implicit Knowledge transforming into Explicit is recognized through the process of conscious reflection on and analysis of output generated by means of Implicit Knowledge (Ellis, R. 2005: 144).

2.4.2The Strong interface Position

The strong interface position is opposite to the non-interface position. This position views that, with the help of Implicit Knowledge, Explicit Knowledge can be acquired and Explicit Knowledge can be converted into Implicit Knowledge. It means that when learners learn grammatical rules, they get the declarative (Explicit) knowledge of these rules and, when they practice these rules, that knowledge can be converted into procedural (Implicit) Knowledge. In this process learners do not forget the Explicit Knowledge of language but they can explicitly verbalize the rules. According to Ellis (2005) the learners do this process unconsciously.

2.4.3 Weak Interface Position

There are three different versions of the Weak Interface Position. However, they have a single common view: Explicit Knowledge can be converted into Implicit Knowledge, but each one of them puts a different limitation on the common view (Ellis, R. 2005: 144).

The first version of the Weak Interface Position states that Explicit Knowledge can turn into Implicit Knowledge through practice only when the learner is developmentally ready to acquire the linguistic form.

The second position views that Explicit Knowledge contributes in an indirect way in the acquisition of Implicit Knowledge. A learner, having Explicit Knowledge of the grammatical features, clearly notices the target feature when encountered in the communicative input and, in this way, learns the grammatical feature faster. DeKeyser (2003) says that noticing the gap is easier to the learners having Explicit Knowledge.

According to the third position, when learners get some Explicit Knowledge they can produce output. Ellis (2005) says that the output of the learners takes the role of an auto-input to the learners themselves.

To conclude, it can be said that Implicit Learning of L2 does not demand central attention of the learner. The process of Implicit Learning takes place unconsciously i.e. the learners are not aware about the learning when it takes place. The knowledge which is achieved in Implicit Learning is subsymbolic in nature, i.e. it is seen in the behaviour of the learners but it cannot be verbalised. In contrast, in Explicit Learning of L2 there is a serious demand of central attention of the learner. The learners have to remember facts. The process of Explicit Learning takes place consciously, i.e. they are aware about the learning when it

takes place. The knowledge which is acquired in Explicit Learning is symbolic in nature, i.e. they can verbalise it.

As stated earlier, Implicit and Explicit Knowledge of the second language (L2) are two central concepts in the field of second language acquisition (SLA). Implicit knowledge of the L2 is the intuitive and procedural knowledge. This kind of knowledge is normally accessed automatically in fluent performance. And it cannot be verbalized. On the contrary, Explicit Knowledge of L2 is often conscious and declarative. It is accessed during controlled processing and it is verbalized.

Works Cited:

Alderson, J., Clapham, C., & Steel, D. (1997). Metalinguistic knowledge, language aptitude and language proficiency. *Language Teaching Research*, *1*, 93–121.

Anderson, J. R. (1980). *Cognitive psychology and its implications.* San Francisco: Freeman.

Anderson, J. and Lebiere, C. (1998) *The Atomic Components of Thought*. Mahwah, NJ: Erlbaum.

Alison Mackey, Susan MGass. (2005). *Second Language Research: Methodology and Design.* Lawrence Erlbaum Associates New Jersey and London.

Bialystok, E. (1979). Explicit and Implicit Judgments of L2 Grammaticality. *Language Learning*, *29*, 81–103.

Bialystok, E. (1994). Representation and ways of knowing: Three issues in second language acquisition. In N. Ellis (Ed*.), Implicit and Explicit Learning of Languages* (pp. 549–569). San Diego, CA: Academic Press.

Bowles, Melissa A. (2011). Measuring implicit and explicit linguistic Knowledge: What can heritage language learners contribute? *Studies in Second Language Acquisition 33*: 247-271.

DeKeyser, R. (1995) Learning second language grammar rules: An experiment with a miniature linguistic system. *Studies in Second Language Acquisition 17*, 379-410.

DeKeyser, R. (1998). Beyond focus on form: Cognitive perspectives on learning and practicing second language grammar. In C. Doughty & J. Williams (Eds.), *Focus on Form in Second Language Acquisition* (pp. 42–63). Cambridge, England: Cambridge University Press.

_____. (2003). Implicit and Explicit Learning. In C. Doughty and M. Long (Eds.), *Handbook of Second Language Learning*. Oxford, England: Blackwell.

Dulay, H. C. & Burt, M. K. (1974). Natural Sequences in Child Second Language Acquisition. *Language Learning 24*, 37–53.

Ellis, N. (1994a). Introduction: Implicit and explicit language learning—An Overview. In N. Ellis (Ed.), *Implicit and Explicit Learning of Languages* (pp. 1–31). San Diego, CA: Academic Press.

_____. (1994b). Vocabulary acquisition: The implicit ins and outs of explicit cognitive mediation. In N. Ellis (Ed.), *Implicit and Explicit Learning of Languages* (pp. 211–282). San Diego, CA: Academic Press.

_____. (2002a). Frequency effects in language processing: A review with implications for theories of implicit and explicit language acquisition. *Studies in Second Language Acquisition. 24,* 143–188.

_____. (2005). At the interface: Dynamic Interactions of Explicit and Implicit Language Knowledge. *Studies in Second Language Acquisition, 27,*305–352.

_____. (2008)Implicit and explicit knowledge about language. In J. Cenoz and N. Hornberger (eds) Encyclopaedia of Language and Education (pp. 119_131). New York: Springer.

Ellis, R. (1991a). Grammaticality judgments and second language acquisition. *Studies in Second Language Acquisition*, *13*, 161–186.

_____. (1994a). A theory of instructed second language acquisition. In N. Ellis (Ed.), *Implicit and Explicit Learning of Languages* (pp. 79–114). San Diego, CA: Academic Press.

_____. (1994b). *The Study of Second Language Acquisition*. Oxford: Oxford University Press.

_____. (1997) *Second Language Acquisition*. Oxford: Oxford University Press.

_____. (2005) Measuring implicit and explicit knowledge of a second language:A psychometric study. *Studies in Second Language Acquisition 27 (2),* 141_172.

_____. (2009) *Implicit and Explicit Knowledge in Second Language Learning, Testing and Teaching*. Rod Ellis, Shawn Loewen, Catherine. Elder, Rosemary Erlam, Jenefer Philp and Hayo Reinders. Bristol, Buffalo,Toronto: Multilingual Matters.

Gass, S. (1994). The reliability of second-language grammaticality judgments. In E. Tarone, S. Gass, & A. Cohen (Eds.), *Research Methodology in Second Language Acquisition* (pp. 303–322). Hillsdale, NJ:Erlbaum.

Gass, S. M., & Selinker, L.(2008). *Second Language Acquisition: An Introductory Course*. 3rd edition. New York: Routledge.

Han, Y., & Ellis, R. (1998). Implicit knowledge, explicit knowledge and general language proficiency. *Language Teaching Research, 2*, 1–23.

Hulstijn, J. and Hulstijn, W. (1984) Grammatical errors as a function of processing constraints and explicit knowledge. *Language Learning 34*, 23-43.

Hu, G. (2002). Psychological constraints on the utility of metalinguistic knowledge in second language production. *Studies in Second Language Acquisition*, *24*, 347–386.272

Hulstijn, J. (2005). Theoretical and empirical issues in the study of implicit and explicit second language learning: Introduction. *Studies in Second Language Acquisition, 27,* 129–140.

Krashen, S. (1981). *Second Language Acquisition and Second Language Learning.* Oxford, England: Pergamon.

Krashen, S. (1994). The input hypothesis and its rivals. In N. Ellis (Ed.),*Implicit and Explicit Learning of Languages* 45–77. San Diego, CA: Academic Press.

Krashen, S. (2009). The comprehension hypothesis extended. In T. Piske &M. Young-Scholten (Eds.), *Input Matters* 81–94. Bristol: Multilingual Matters.

Piske Thorsten and Young Marta Scholtern (Ed.). (2009). *Input Matters in Second Language Acquisition.* Bristol: Multilingual Matters.

Reber, A. (1989) Implicit learning and tacit knowledge. *Journal of Experimental Psychology*: *General, 118*, 219–235.

Schmidt, R. (Ed.) (1995). *Attention and awareness in foreign language learning*. Honolulu, HI: University of Hawaii.

_____. (1990) The role of consciousness in second language learning. *Applied Linguistics 11,* 129-158.

_____. (1994). Deconstructing consciousness in search of useful definitions for applied linguistics. *AILA Review 11*, 11-26.

_____. (2001). Attention. In P. Robinson (ed.) *Cognition and Second Language Instruction.* Cambridge: Cambridge University Press.

Skehan, P. (1998). *A cognitive approach to language learning*. Oxford, England: Oxford University Press.

Tavakoli Hossein (2013). *A Dictionary of Language Acquisition.* Tehran, Iran: Rahnama Press

VanPatten, B., & Benati, A. (2010). *Key Terms in Second Language Acquisition*. London: Continuum.

VanPatten, B., & Williams, J. (Eds.) (2007). *Theories in second language acquisition.* Mahwah, NJ: Lawrence Erlbaum.