

Roles of output and noticing in English language learning:
Effects of exposure to relevant input immediately after
output on the incorporation of linguistic forms

2009

Joint Graduate School (Ph.D. Program)
in the Science of School Education
Hyogo University of Teacher Education

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Chapter 1

Introduction

1.1 Focus

For the last decade, there has been a great interest in how Japanese learners' English communicative proficiency can be fostered and how Japanese learners of English come to be able to produce English efficiently. There has also been growing criticism of the current English language education from the business world. In response to this situation, the Ministry of Education, Culture, Sports, Science and Technology issued an Action Plan to Cultivate Japanese with English Abilities in 2003, in which two goals are set. The first goal concerns English language abilities required for all Japanese nationals and says "On graduating from junior high school and senior high school, graduates can communicate in English." The second goal specifies English language skills required for specialized fields or for those active in international society and says "On graduating from university, graduates can use English in their work." In both cases, the ability to express what one wants to convey clearly is highly emphasized. The reality is, however, that many Japanese learners of English have difficulty in acquiring that ability and cannot express their intended meaning freely.

To improve English language education, the Ministry proposes seven actions. They are: (1) Improvement of English classes, (2) Improving the teaching ability of English teachers and upgrading the teaching system, (3) Improving motivation for learning English, (4) Improvement in the evaluation system for selecting school and university applicants, (5) Support for English conversation activities in elementary schools, (6) Improvement of Japanese language abilities and (7) Promotion of practical research. It is now necessary for English language education researchers to make a serious effort in tackling with how practical English proficiency of Japanese people can be developed.

It seems that the main problem which many Japanese learners of English have in common is how to

move from an initial state, where target forms are not known at all, to an end-state, where they have some command over the system of the target language (TL) and some capacity to use that system for production. English language education researchers who teach at universities or colleges are required to provide graduates with the ability to use English in their work. Empirical studies which deal with the question how learners' production ability can be fostered are strongly required.

The primary concern of the present study is to elucidate how output and noticing triggered by output encourage Japanese learners of English to incorporate linguistic forms into their interlanguage (IL) system. To put it another way, the present study will try to clarify influences of output and noticing triggered by output on their IL development.

Despite its importance, the study of output was not central within second language acquisition (SLA) research. To quote Skehan (2002), "...output has been viewed either as the immediate and pervasive consequence of underlying structural change, or the result of a process of automatization" (p.85). That is, output was considered to be the consequence of learning rather than the process of learning and was synonymous with what learners had learned. In the last decade or so, however, new analyses of output have given it a more central role in second language (L2) learning. Swain (1985) was the first researcher that emphasized the importance of output in L2 learning. When learners cannot encode their intended meaning successfully, they have to maximize the use of their current linguistic knowledge to make their output understood by their interlocutors. The effort to produce comprehensible output is assumed to provoke various cognitive processes, which in turn bring about desirable IL development (Izuimi, 2002, 2003; Muranoi, 2007; Swain, 2005; Swain & Lapkin, 1995). Tarone and Liu (1995) also assume that the situation where learners are struggling to express themselves in an L2 is most likely to bring about the desirable changes of their IL system.

According to Gass (1988), there are five stages whereby L2 learners convert input to output: Apperceived input, comprehended input, intake, integration and output. What learners have to do first with input is to perceive it in light of their past experiences and currently held knowledge. The input that is

apperceived, or noticed, is processed and gets comprehended. The input that is comprehended can then become intake. It is assumed whether comprehended input converts to intake or not depends on the level of analysis made by learners. If input becomes intake, the intake data can be used for hypothesis re-confirmation or rule strengthening. As a result, the integration of new knowledge into IL system is facilitated. Gass sees output as playing an active role in the L2 acquisition process and stresses the importance of comprehensible output in testing a hypothesis. This creates a feedback loop from output into intake, where hypothesis formulation is considered to take place. The process is shown in Figure 1.1.

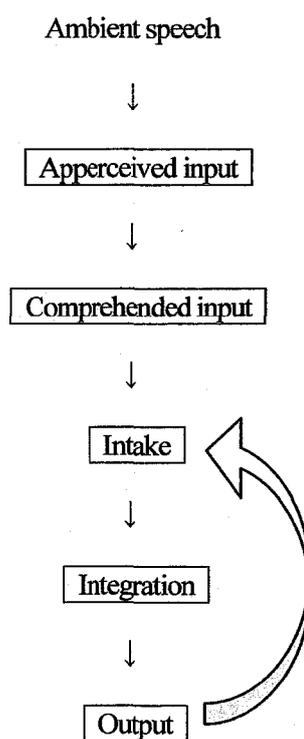


Figure 1.1 A model of SLA (Adapted from Gass, 1988, p.200)

It should be noted that Gass, following Swain (1985), regards output not only as a result of learning but also as an active component in the L2 learning process. L2 learners do not simply recycle their limited repertoires of language elements. It should be stressed here that they also try to use and incorporate newly learned forms, which results in stretching their IL system.

Noticing is another important issue which will be dealt with in the present study. There are three levels of noticing (Swain, 2000). "Noticing a hole" occurs when learners cannot encode their intended meaning precisely in a TL. "Noticing a form" refers to the situation where learners simply notice a form in input. "Noticing the gap" occurs when learners notice the difference between their own linguistic realization and the target linguistic form suitable for their intended meaning. It necessarily involves comparing the former with the latter and this is referred to as a "cognitive comparison" (Doughty, 2001). For learners to notice the gap, their own linguistic realization, or output, is necessary.

During the production process, learners may notice that they cannot encode their message meaning exactly because of their limited linguistic resources and have to content themselves with less precise expressions. Encountering a linguistic deficiency, L2 learners have to resort to communication strategies (CSs) to overcome the deficiency. It seems that the use of CSs enables the effective communication of meaning. Some researchers, however, consider that resorting to CSs makes fundamental L2 development less likely to happen and that the only function such strategies have is to solve some sort of communicative breakdown so that conversation can proceed (Schmidt, 1983; Skehan, 1998).

Although how the use of CSs contributes to the development of L2 learners' IL system has been a topic of great interest, there has been little agreement on the issue. Bialystok (1990), for example, has argued that "...what one must teach students of a language is not strategy, but language" (p.147). Larsen-Freeman and Long (1991), on the other hand, have pointed out that all CSs are helpful for L2 learning because such strategies enable learners to keep the conversation going and as a result, they are likely to have more input.

Another topic of interest is whether the use of CSs is transferable from learners' first language (L1) to an L2. Concerning this issue, Kitajima (1997) has suggested that "...strategies used to cope with communicative problems are not automatically transferred from the learner's first language but are acquired in the process of using the target language in particular contexts" (p.21).

The Output Hypothesis (see 2.4 for further details), which was proposed by Swain (1985), can be

interpreted as arguing for positive roles CS use is assumed to play in L2 learning although the hypothesis does not refer to CSs directly.

Cumming (1990) has suggested that output creates a situation wherein learners analyze and consolidate the L2 knowledge that they have previously (but not yet fully) acquired. This view is also considered to be in favor of the positive roles CS use plays in L2 learning. Takeuchi (2003) has pointed out that learners with high proficiency are more likely to use less familiar expressions and/or try to encode meaning which their currently held linguistic knowledge is not enough to realize linguistically than learners with low proficiency. His point is that successful language learners are likely to put themselves into a situation where they have to make a conscious effort to make their output more comprehensible while less successful learners avoid such a situation. This also suggests that CS use contributes to better learning of English. Figure 1.2 illustrates how CSs operate during an output process.

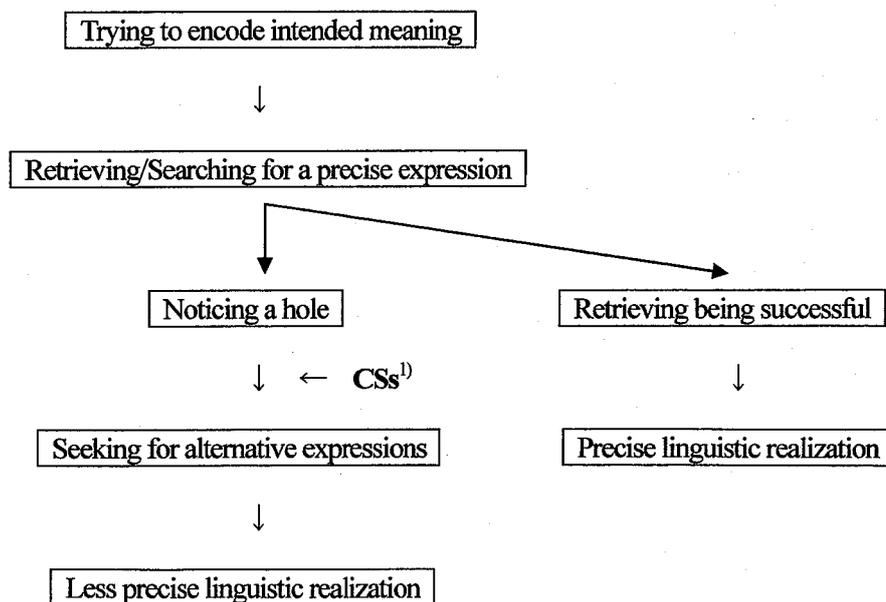


Figure 1.2 CSs in an output process

Foster (2001) considers that L2 learners rely on lexicalized chunks of language which function as “wholes” and thereby ease processing demands since they are retrieved without an internal analysis or

construction. Sinclair (1991) also assumes that L2 learners first attempt to retrieve memorized chunks. According to his “idiom principle,” they resort to rule-constructed language when such lexicalized retrieval fails. When lexicalized knowledge is available, learners do not notice a hole in their IL system. In resorting to rule-constructed language, they are likely to notice a hole in their currently held linguistic knowledge, which forces them to seek alternative expressions with CSs. This process leads learners to be engaged in various cognitive processes which will bring about L2 development. It can be considered that the situation where CSs²⁾ are employed is an optimal condition for L2 learning because a learner’s use of CSs can function to stretch his or her IL system beyond its current limit, resulting in free variation as the learner tests new hypotheses in the search for an appropriate lexical item or structure (Tarone, 1995). By resorting to CSs, L2 learners manage to encode their intended meaning even if the resultant output is not satisfactory enough for them. If relevant input is presented in a timely manner, learners are likely to compare their own output with a linguistic form in the relevant input. This is referred to as a cognitive comparison, which is assumed to play a crucial role in L2 learning (Saxton, 1997). Although to discuss CSs as a whole is beyond the scope of the present study, it is likely that CSs facilitate L2 learning in a way that they prompt learners’ noticing and create an optimal condition for L2 learning.

Noticing, or paying selective attention, is viewed as a necessary component for efficient L2 learning. The present study will not discuss whether there can be learning without noticing or not. It seems virtually impossible to answer the question whether there can be any learning on the basis of unattended and subliminal processing. As Gass (1997) has shown, it may be true that some learning does not depend on input and thus does not require attention to be focused. What the present study is concerned with is not whether there can be any learning without attention and conscious involvement but rather whether more attention results in more learning (Baars, 1988). The present study will deal primarily with whether learners’ noticing facilitates L2 learning or not.

Language learning, in the post-critical period, is considered to require learners’ attention to be drawn to form (Long, 1991; Long & Robinson, 1998). L2 learners’ attentional resources are limited and tend to

be drawn to meaning rather than form. As VanPatten (1992) has proposed, L2 learners process input for meaning before processing it for form. There should be some device to overcome their predisposition to focus on meaning in order to bring about desirable IL development. As the Noticing Hypothesis (see 3.2 for further details) claims, merely being exposed to input without conscious processing is not sufficient for IL development to take place. There also has to be awareness of some aspect of form. It seems that L2 learners are advantaged if there is awareness of the importance of form in a situation where meaning is given higher priority. For continued development of their IL system to be possible, learners have to notice their linguistic deficiency through output and bridge the gap between their IL and the TL.

The procedure where relevant input is presented after output (henceforth, the output-input activity) seems to offer an opportunity where learners are engaged in the three levels of noticing. They notice a hole in their currently held linguistic knowledge, notice a form in relevant input and notice the gap between their IL form and a TL form through a cognitive comparison (Swain, 2000). It may lead L2 learners to replace their fossilized³⁾ linguistic forms with correct ones. It is plausible that the cognitive processes which learners are engaged in during the output-input activity contribute to IL development. The present study is primarily concerned with clarifying how the output-input activity influences the IL development of Japanese learners of English.

1.2 Organization

The present study consists of seven chapters including this introductory chapter (Chapter 1). The purpose of this chapter is to explain the focus of the present study and present the outline of each chapter.

Chapter 2 is concerned with output. Although all language-learning theories affirm the importance of input, opinions vary as to the positive roles of output in L2 learning. Krashen (1982, 1985), for example, has argued that decoding comprehensible input is sufficient for L2 learning. On the other hand, Swain (1985) has argued that learners cannot develop the ability to use grammatically correct expressions by decoding input alone. The present study assumes that comprehension and output have different roles in L2

learning and tries to clarify how output contributes to L2 learning. The chapter will first review Krashen's Input Hypothesis and Swain's Output Hypothesis. It will then claim the validity of the Output Hypothesis and review several empirical studies which investigated the role of output in L2 learning. Finally, it will confirm the importance of output in L2 learning.

Chapter 3 is concerned with the role of noticing in L2 learning. Whether learning is driven consciously or unconsciously has been a controversial topic for L2 researchers. Schmidt (1990) has claimed that what is noticed becomes intake which is necessary for L2 learning. He assumes, based on his own learning experience, that noticing is a necessary condition for L2 learning. This is called the Noticing Hypothesis. Although noticing is generally considered to be a necessary component for L2 learning, opinions differ as to whether it is indispensable for L2 learning or not.

The chapter will first review attention, consciousness and noticing to elucidate the relationship between them. It will then review the Noticing Hypothesis. Although it is a fascinating hypothesis for L2 researchers and teachers, it has also drawn criticism from several researchers (for example, Tomlin & Villa, 1994; Truscott, 1998). The chapter will review the details of their criticism and confirm the validity of the hypothesis. Then, focus on form, in which attention-drawing devices are employed to facilitate L2 learning, will be reviewed. It is then suggested that L2 learning is mainly driven by what learners notice in TL input. It is finally argued that consciousness at the level of noticing is necessary for L2 learners to learn new knowledge on the TL.

The discussions in Chapters 2 and 3 suggest that exposure to relevant input immediately after output seems to contribute to desirable IL development of Japanese learners of English. Chapter 4 will first show a hypothetical way which illustrates how output and noticing triggered by output bring about desirable IL development. Then, theoretical support for the output-input activity will be provided. Four factors which explain why the activity brings about desirable IL development are: Syntactic processing evoked by output, attention to be focused on form, a cognitive comparison and a preference for recent speech. Then six research questions will be formulated which the present study is going to answer. Finally,

six hypotheses will be formulated based on the research questions.

Chapter 5 will report the three experimental studies which were conducted to clarify the influences of output and noticing triggered by output on the development of IL system of Japanese learners of English. Although the three studies are motivated by different objectives and employ different output tasks, the results of them basically suggest that output and noticing triggered by output contribute to the incorporation of linguistic forms by Japanese learners of English and that the output-input activity contributes to L2 learning in its own way.

Chapter 6 will test the six hypotheses formulated in Chapter 4. The results of the three studies reported in Chapter 5 argue for important roles of output and noticing triggered by output in L2 learning. It is finally concluded that output has its own role to play in L2 learning and that L2 learners mainly learn what they have noticed and processed for comprehension.

The last chapter, reviewing the preceding six chapters, will consolidate the findings of the present study and confirm their significance in English language education. After explaining what the findings of the present study imply, it will then propose an instructional treatment called the output-input activity with guided summarizing. Finally, it will discuss the limitations of the present study, emphasize the necessity of further empirical research on output and noticing and provide suggestions for future studies.

Notes

1) One can argue that CSs are also used to enhance communication as well as to solve problems. Though I agree that advanced learners can employ CSs to enhance communication, CSs used for the purpose will not be dealt with in the present study. The present study is concerned with CSs which are used to solve problems.

2) I will limit my discussion to achievement strategies in the present study. While reduction strategies do not seem to promote learning, achievement strategies such as “circumlocution” and “approximation” (Tarone, 1977) contribute to learning.

3) "Fossilization" is a process which incorrect linguistic features become a permanent part of the way a person speaks or writes a language (Richards & Schmidt, 2002, p.211).

Chapter 2

Output in English Language Learning

For the success of second language acquisition (SLA), it is clear that learners should be exposed to enough input of the target language (TL). Krashen (1982, 1985), for example, claims that the presence of comprehensible input is sufficient for SLA. All language-learning theories affirm the importance of input. Merely decoding input, however, does not seem to guarantee language acquisition. For example, Swain (1985), based on empirical data, has argued that merely understanding input does not foster the ability to use grammatically correct expressions. On the other hand, connectionists assume that learning is primarily driven by input and put less importance on producing output (de Bot, Lowie & Verspoor, 2005).

It is generally accepted that both decoding input and producing output constitute an important part of second language (L2) learning. The present study assumes that they have different roles in L2 learning and tries to clarify how producing output contributes to the development of interlanguage (IL) system. This chapter will first review Krashen's Input Hypothesis and Swain's Output Hypothesis. It will then claim the validity of the Output Hypothesis and review several empirical studies which investigated the role of producing output in L2 learning. Finally, it will emphasize the importance of producing output in L2 learning.

2.1 Krashen's Input Hypothesis

Krashen (1985), who considered that the process of SLA was quite similar to that of first language (L1) acquisition, has argued that people do not learn a language by talking about it (that is, studying the rules of grammar), but by experiencing enough meaningful input and communication within the TL.

In his Monitor Model, Krashen distinguishes two distinct processes in L2 development, which are "acquisition" and "learning." He argues that "acquisition," which is considered to be a subconscious

process, encourages L2 learners to develop competence. The latter process refers to the conscious study and the knowledge of grammatical rules. He asserts that knowledge of consciously learned language is distinct in memorial representation from that of unconsciously acquired language, that the latter type of knowledge can be deployed in spontaneous language use and that there can be no interaction between these two independent knowledge systems.

Krashen proposed five theoretical hypotheses in his Monitor Theory of SLA. The Input Hypothesis, which is one of the five theoretical hypotheses, assumes that exposure to comprehensible input which contains structures that are slightly in advance of a learner's current level of competence is the necessary and sufficient cause of SLA. For example, if a learner is at the stage "i," then acquisition takes place when he or she is exposed to comprehensible input that belongs to the stage "i+1." Because not all learners are at the same level of linguistic competence at the same time, Krashen suggests that it is important that each learner receives some "i+1" input that is appropriate for his or her current stage of linguistic competence. He further argues that producing output does not make a real contribution to the development of linguistic competence because: (1) Output, especially comprehensible output, is too scarce, (2) It is possible to attain high levels of linguistic competence without output and (3) There is no direct evidence that output leads to language acquisition. R. Ellis (1997) has also argued that there is no strong evidence that output practice is beneficial for SLA. It is generally agreed that Krashen's insights have given a strong impetus to fundamental issues in current SLA research. It is true, however, that his distinctions and hypotheses cannot be supported as originally proposed.

2.2 A Critique of Krashen

Although he took components from various research fields – L1 acquisition, developmental studies, neuro-psychology and so on – and forged them into a model for SLA, Krashen did not offer a coherent theoretical basis for the model. Several drawbacks have been pointed out concerning his ideas on SLA.

First, it is basically wrong that the process of SLA is quite similar to that of L1 acquisition. In

Japan, for example, people start learning English when they enter a junior high school, which means they have already arrived at the formal operational stage where abstract thinking and logical manipulation are possible (Piaget & Inhelder, 1969). If learners contact an L2 for the first time after arriving at the formal operational stage and start learning it, problem-solving abilities are employed to learn it instead of the language acquisition device (LAD). This is the primary reason why many of them cannot succeed in learning it (Rosansky, 1976). Rosansky assumes that adult language learners are less successful than children because they learn an L2 through a process which is different from that of children's L1 and L2 acquisition. Scovel (1988) and Pinker (1994) both assume that brain plasticity is the cause which makes it difficult for adult language learners to learn an L2. Plasticity, or neuroplasticity, is the lifelong ability of the brain to reorganize neural pathways based on new experiences. People acquire new knowledge and skills through instruction or experiences. In order to learn or memorize a fact or skill, there must be persistent functional changes in the brain that represent the new knowledge. The term *neuroplasticity* refers to the ability of the brain to change with learning. After an L1 is acquired, the brain area for language acquisition is not necessary anymore and it degenerates or is utilized for other purposes. As for junior high school students in Japan, they have already acquired their L1 and cannot be expected to be able to acquire English in the same way they acquired their L1, or Japanese.

Second, Krashen's clear distinction between acquisition and learning is going too far. For him, they are completely independent. Acquisition is the product of a subconscious process and learning is the product of formal teaching and results in conscious knowledge about the language. His view is referred to as the non-interface position. The non-interface position asserts that learned knowledge can never become acquired knowledge. He posits that results of explicit "learning" can never lead to implicit, or "acquired" knowledge. This view has been questioned by several researchers (DeKeyser, 1997, 1998; Hulstijn, 1995; McLaughlin, 1978, 1990; Schmidt, 1990, 1994, 1995; Swain, 1985; Swain & Lapkin, 1995). When L2 learners learn new grammatical knowledge on a TL, it is first stored as declarative knowledge. Knowledge at a declarative stage is not automatized and L2 learners cannot make use of it instantaneously because of

the mental effort which is required to encode their intended messages through controlled processing. L2 learners with low proficiency have to especially make a lot of conscious effort to retrieve linguistic forms to realize their intended messages (Iwanaka, 2008a) because of their limited experiences with the TL. It is considered that declarative knowledge turns into procedural knowledge through practice. Practice plays an important role in improving performance so that it becomes more rapid and stable (Ranta & Lyster, 2007). Anderson (2000) and DeKeyser (2007a) suggest that practice brings about proceduralization of rules. A great number of L2 teachers would also probably agree with the idea that L2 learners can obtain better control of linguistic forms through practice. It can be said safely that practice can turn the results of explicit “learning” into implicit, or “acquired” knowledge. Practice facilitates the process of turning declarative knowledge into procedural knowledge as shown in Figure 2.1.

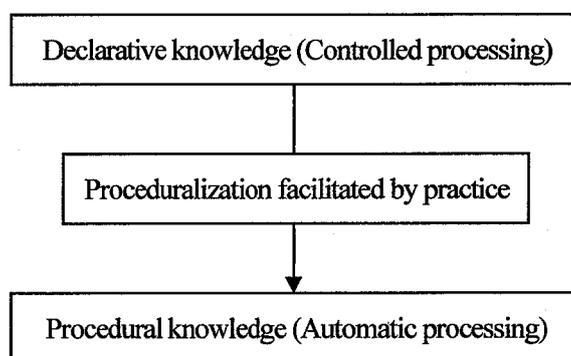


Figure 2.1 ACT model (Based on Anderson, 2000)

Third, Krashen makes light of the importance of producing output. He argues that producing output serves only for generating comprehensible input from the interlocutor. He does not understand that producing output and comprehension have different natures. Producing output is assumed to push learners to impose syntactic structure on their utterances. This is in contrast to comprehension, in which it is not always essential for learners to draw on knowledge of L2 syntax. Decoding input, or comprehension, does not require learners to attend to all the information in it. VanPatten (1996) has argued that learners’ attention tends to be drawn to certain parts of input, particularly those that are immediately necessary to

understand the message. In decoding input, L2 learners are first likely to search for content words such as verbs, nouns and adjectives. As content words usually convey more meaning than function words and morphological forms, L2 learners can understand the input quite successfully without syntactic parsing. It is not likely that L2 learners develop the ability to use grammatically correct expressions without output practice. It should be stressed that L2 learners' output also plays crucial roles in L2 learning, along with comprehending input.

2.3 A Process of Language Production

To understand the psycholinguistic mechanisms of language production, it is necessary to examine how intended meaning is realized linguistically. Levelt's (1989, 1993) language production model serves this purpose. Among several models of language production (see T. Harley, 2001, for reviews of production models), Levelt's speech production model, which was originally developed for L1 production, has been widely employed to examine processes involved in L2 production (for example, Bygate, 2001; de Bot, 1996; Doughty, 2001; Izumi, 2003; Pienemann, 1998). According to Levelt (1989, 1993), speech production consists of three components. They are the Conceptualizer, the Formulator and the Articulator. Figure 2.2 is a simplified version of Levelt's speech production model.

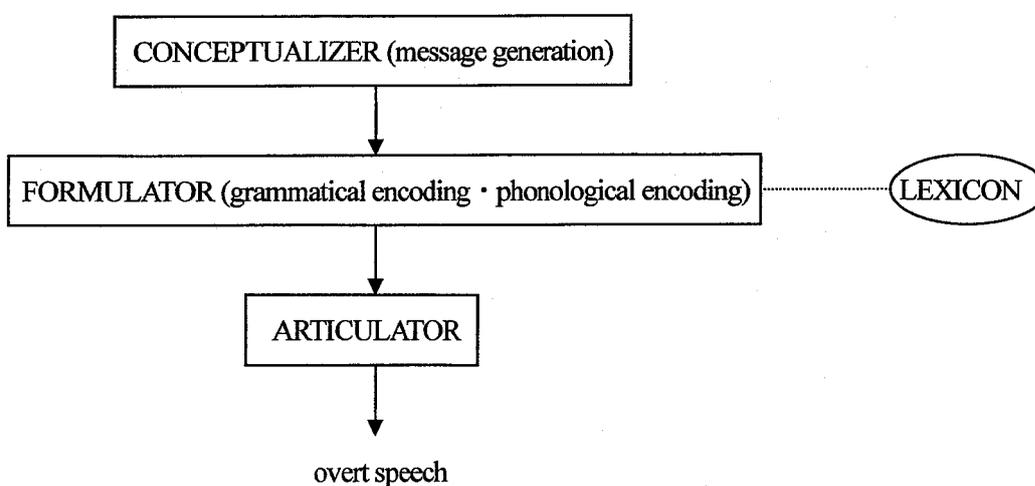


Figure 2.2 Processes in speech production (Adapted from Levelt, 1989, p.9)

The conceptualizing component, or the Conceptualizer, generates a “preverbal message” and contains meaning intentions that have to be put into words and sentences in the next two stages. This preverbal message contains a number of conceptual characteristics, which lead to the selection of a set of lexical items called “lemmas” in the Formulator. Each lemma contains the syntactic and morphological information of lexical items as well as the semantic information. Levelt claims that the speaker’s lemma information is declarative knowledge stored in his or her mental lexicon. The Formulator translates a conceptual structure into a linguistic one through two major processes. The first step is grammatical encoding, consisting of procedures for accessing lemmas and of the syntactic building procedures. Grammatical encoding results in a surface structure of a sentence in which all properties of selected lemmas are satisfied. The second step of formulating is phonological encoding, in which the phonological information associated with the selected lemmas is matched to phonologically encoded word frames. The product of phonological encoding is a phonetic and articulatory plan, which is executed in the Articulator. The Articulator turns the articulatory plan into audible sounds, or “overt speech” in the figure.

Levelt (1989) discusses these three components from the perspective of automaticity. He has argued that conceptualizing involves highly controlled processing that requires attentional resources. It is plausible that conceiving intentions and keeping track of what was said before are not automatic. To do so demands even native speakers to spend attentional resources. He also claims that formulating and articulating are basically automatic and require very little controlled processing. Although it is the case with native speakers, L2 learners have to go through these two processes with conscious effort. They carefully choose appropriate linguistic forms to realize their intentions linguistically and turn the surface structure into overt speech. This is where L2 production is different from L1 production. Formulating and articulating are not automatic for L2 learners.

Towell, Hawkins and Bazergui (1996) claim that L2 learners who stayed in a foreign country where the TL was spoken for a certain period increase fluency because proceduralization takes place in the Formulator, in which generated intentions are encoded grammatically and phonetically. This suggests

that L2 teachers should provide output activities which are considered to facilitate the formulating component in class. Although Levelt's language production model is designed to account for adult native speakers' speech production process, it also provides a valuable insight into how L2 teachers can help their learners develop the ability to produce the TL. It also helps L2 teachers recognize the importance of lexical items in promoting grammatical encoding in an L2.

2.4 Swain's Output Hypothesis

In the 1980s, the term *output* was used to indicate the outcome of learning. Output was synonymous with what learners had learned and was not regarded as part of the process of learning. This view was questioned by Swain (1985), who proposed the potential roles of producing output in L2 learning based on a large-scale research project on Canadian French immersion programs. She has pointed out that the immersion students do not use grammatically correct and sociolinguistically appropriate expressions because they can make themselves understood in the TL by resorting to their highly developed strategies for successful communication.

It should be noted that the immersion students are exposed to ideal input of the TL. It means that the exposure to comprehensible input alone is not a sufficient condition for successful L2 learning. Swain has emphasized the importance of "pushed output" in SLA. Her assertion is that "Simply getting one's message across can and does occur with grammatically deviant forms and sociolinguistically inappropriate language. Negotiating meaning needs to incorporate the notion of being pushed towards the delivery of a message that is not only conveyed, but that is conveyed precisely, coherently, and appropriately" (Swain, 2005, pp.472-473). That is, L2 learners should be given opportunities to extend their linguistic repertoire by attempting to produce the TL precisely and appropriately.

Swain (1995) outlined three functions of producing output in L2 learning: (1) The noticing function, (2) The hypothesis-testing function and (3) The metalinguistic (reflective) function. Before discussing them in detail, the context in which the Output Hypothesis was formulated will be explained to understand

why the hypothesis was proposed.

2.4.1 Context in Which Output Hypothesis Was Formulated

Swain (2005) has stated that the context in which the Output Hypothesis was formulated had two important aspects. One was the dominant theoretical paradigm for L2 acquisition research in the 1980s: Information-processing theory. Research field of L2 acquisition was dominated by the concept of input and considerable research effort was devoted to the study of input. The Xth University of Michigan Conference on Applied Linguistics, for example, was exclusively concerned with the topic of language input (Gass & Madden, 1985).

The other was the French immersion programs in Canada, in which English-speaking children were taught some of their curriculum in French. Evaluations were conducted of these programs and the results of these evaluations demonstrated that the French proficiency of the immersion students was more advanced than that of students taking 20 to 30 minutes a day of French as an L2. Furthermore, on some tests of French listening and reading comprehension, the immersion students' scores were as high as those obtained by the native French students of the same age. When asked to write about immersion education for a special issue of *Language and Society*, Krashen (1984) stated that "...second language acquisition theory provides a very clear explanation as to why immersion works. According to current theory, we acquire language in only one way: when we understand messages in that language, when we receive comprehensible input" (p.61). As for listening and reading abilities, Krashen's Input Hypothesis was the case and the immersion programs were successful.

The immersion students' speaking and writing abilities, however, were different from those of their francophone counterparts in many ways, which led Swain to raise doubts about the validity of the Input Hypothesis. In spite of an abundance of comprehensible input, the immersion students did not develop the ability to produce grammatically correct expressions. The Output Hypothesis was formulated to explain this phenomenon. Observations in the immersion classes revealed that the teachers did not "push" the

students to use the TL in a manner that was grammatically correct and sociolinguistically appropriate. The students simply made themselves understood and did not make conscious effort to speak precisely and appropriately. Swain (1985) has asserted that negotiating meaning needs to be extended beyond the usual sense of simply getting one's message across. If L2 learners are satisfied with simply getting their messages across, their IL system tends to get fossilized. L2 learners need to be "pushed" to use correct and appropriate expressions. Under this circumstance, the act of producing language constitutes part of the process of L2 learning. It is necessary to note that the Output Hypothesis is about what learners do when they are "pushed" and what processes they are engaged in. The term *comprehensible output* refers to the output that is an improved version of an earlier version in terms of its information content and/or its grammatical, sociolinguistic or discourse features.

2.4.2 Three Functions of Output in L2 Learning

Producing output is assumed to have its own roles in L2 learning. As mentioned above, Swain (1995) proposes three roles that producing output is considered to play in L2 learning. They are: The noticing/triggering function, the hypothesis-testing function and the metalinguistic (reflective) function.

2.4.2.1 The Noticing/Triggering Function

Not all input is converted into a learner's IL system. Imagine that a learner is exposed to a significant body of L2 data. Some language data passes through to the learner and some does not. For the data to pass through to the learner, it needs to be apperceived, or noticed by the learner.

One important role of producing output is to trigger noticing. While producing output, L2 learners may notice that they do not know a precise expression for the meaning they would like to convey. That is, producing output provides L2 learners with an opportunity to recognize their linguistic problems consciously. When they realize a problem during output, they resort to communication strategies (CSs) and manage to get their message across. If they realize a linguistic problem, that is, they notice a hole, L2

learners' attention is likely to be selectively led to relevant input (Swain, 1998; Swain & Lapkin, 1995). Learners may notice a form in the relevant input which can fill the hole. They “may notice the difference between what they themselves can or have said (or even what they know they cannot say) and what more competent speakers of the TL say instead to convey the same intention under the same social condition” (Doughty, 2001, p.225).

It can be assumed that producing output promotes learners to notice a hole in their IL system, notice a form in relevant input to fill the hole and notice the gap between their own linguistic realization and its target counterpart. Figure 2.3 shows how producing output promotes the three types of noticing: Noticing a hole, noticing a form and noticing the gap.

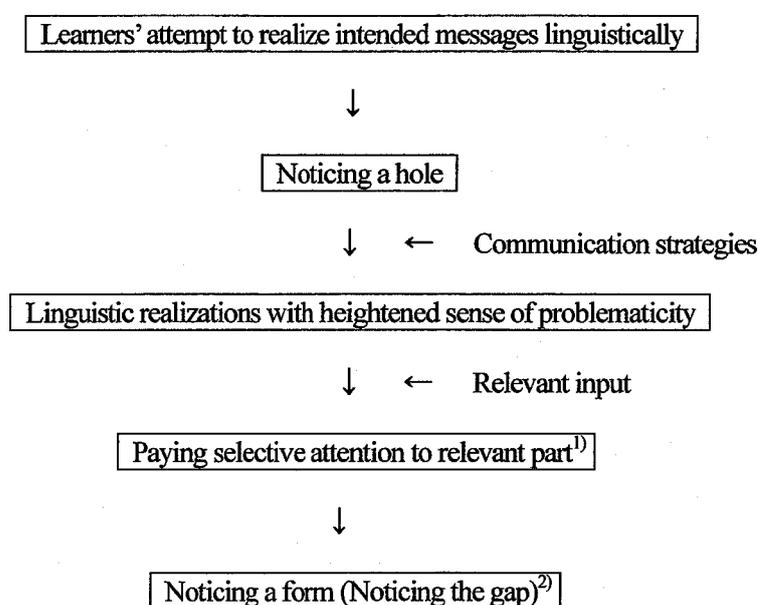


Figure 2.3 A way in which output promotes three types of noticing

Noticing triggers important cognitive processes such as selective attention and a cognitive comparison, both of which are considered to be important in L2 learning.

Although noticing is assumed to play a crucial role in L2 learning, opinions differ as to whether noticing is indispensable for L2 learning or not. To understand what noticing is in full measure, it is

necessary to understand the relationship between noticing, attention and consciousness as they are closely related. A full-fledged discussion on noticing, attention and consciousness will be given in Chapter 3.

2.4.2.2 The Hypothesis Formulation and Testing Function

If L2 learners notice a hole while trying to convey their intended message, they try to fill the hole by resorting to communication strategies. Noticing a hole, which is stimulated by producing output, is regarded as triggering other cognitive processes that generate new linguistic knowledge or consolidate currently held knowledge (Swain, 1998; Swain & Lapkin, 1995).

These cognitive processes include formulating a hypothesis about the TL system and testing it. Schachter (1984) defines an L2 learner's hypothesis as "a prediction that a certain aspect of the language is organized in a certain way" (p.169). When they are trying to encode their intended meaning, L2 learners are considered to be in one of the following situations (Muranoi, 2006, p.69):

- (1) They know the exact form to convey their intended meaning and can encode the meaning appropriately.
- (2) Although they can encode their meaning, the linguistic realization deviates from the norm of the TL language system.
- (3) They use a form which is available to them to encode their intended meaning although they are not sure whether it is right or not.
- (4) They create a new form based on their existing knowledge on the TL although they are not sure whether it is right or not.
- (5) They cannot realize their intended meaning linguistically at all.

When they are in (1), (2), (3) or (4), it is likely that L2 learners are thinking about how to realize their intended meaning linguistically. When they are in (4), it is likely that they consolidate their IL knowledge,

create a new rule about the TL and test it. This process is called the hypothesis formulation and testing. If relevant input is provided after producing output in a timely manner, they can confirm, modify or reject the formulated hypothesis. Cognitive processes involved in hypothesis testing are considered to play a crucial role in L2 learning (Doughty, 2001; Izumi, 2003; Swain, 1998).

For L2 learners, whose linguistic resources are more limited than those of native speakers, producing output in the TL is a process which involves hypothesis formulation and testing. As a result, they may use an expression which they have never used before. It is likely that producing output gives them a chance to stretch their IL system to meet communicative goals.

2.4.2.3 The Metalinguistic (Reflective) Function

Listeners interpret sentences in the belief that what the speaker is saying makes sense to them, which Clark and Clark (1977) call “reality principle.” A primary strategy under this principle is to use content words alone. Without reflecting on language, they can understand language. As Krashen (1982) has pointed out, people do not always utilize syntax in understanding language because “in many cases we get the message with a combination of a verb, or lexical information plus extra-linguistic information” (p.66).

Producing output is different from comprehension in that learners cannot rely on external cues and general world knowledge. They need greater syntactic processing in production. Producing output in an L2 is thought to force learners to move from semantic processing to syntactic processing (Kowal & Swain, 1997).

While they are engaged in syntactic processing, they use language to reflect on language. The language which learners produce to reflect on language use is referred to as metatalk, which demonstrates how learners are consciously thinking about the TL. Swain (1998) argues that this metatalk helps learners deepen their understanding of form-meaning-function relationship.

In production, learners are responsible for both generating a message and realizing it linguistically. Although it might be possible for them to resort to non-verbal forms of communication such as gestures

and facial expressions to compensate for their linguistic deficiency, there is less chance to escape syntactic processing in producing output than in comprehending input. That is why output leads L2 learners to be more conscious of syntax of the TL. Opportunities for producing output lead learners to think about word order, grammatical concord, morphology and so forth. For learners to gain control over syntactic processing, exposure to input alone is not enough and opportunities to produce output are indispensable to the facilitation of grammatical encoding.

2.5 Validity of the Output Hypothesis

Since it was announced in 1985, the Output Hypothesis has attracted SLA researchers' attention and generated some empirical studies to clarify the potential roles of producing output in L2 learning. Their results show that producing output has specific functions in L2 learning under a certain condition. They basically agree in that producing output has different roles from comprehension. Major empirical studies which testified the roles of producing output in L2 learning are shown in Table 2.1.

Table 2.1

Testified Roles of Output and Major Studies

Testified role of output	Major study
Noticing function	Izumi (2002), Izumi & Bigelow (2000), Swain & Lapkin (1995)
Hypothesis formulation and testing function	R. Ellis & He (1999), Nobuyoshi & Ellis (1993), Pica (1988), Shehadeh (2001, 2003)
Metalinguistic function	Kowal & Swain (1994), Swain & Lapkin (2001)

It is usually considered to be difficult to testify that learners use output to test a hypothesis because an inspection of data alone is not enough to show that. Gass (2003), however, provides an example of an

active hypothesis-testing mode as illustrated in (1):

(1) Hypothesis testing (INT = interviewer, NNS = non-native speaker)

NNS: poi un bicchiere (then a glass)

INT: un che, come? (a what, what?)

NNS: bicchiere (glass)

During the stimulated recall session following this interaction, the NNS reported: "I was drawing a blank. Then I thought of a vase but then I thought that since there were no flowers, maybe it was just a big glass. So, then I thought I'll say it and see. Then, when she said 'come?' (what?), I knew that it was completely wrong." The comment "I'll say it and see." suggests that the NNS was using output as a means to see whether her hypothesis was correct or not.

The empirical studies mentioned in Table 2.1 are considered to support the Output Hypothesis. The next issue to be discussed is what L2 learners learn through output. The Output Hypothesis claims that producing output leads L2 learners to acquire certain aspects of knowledge on the TL which they cannot acquire through comprehension. Producing the TL prompts L2 learners to move from the semantic and strategic processing common during comprehension to the complete syntactic processing necessary for accurate production. Producing output, thus, would seem to have a potentially significant role in the development of syntax and morphology. Long (1996) agrees with this idea and claims that producing the TL encourages the analysis of linguistic forms.

As discussed in 2.3, production consists of three components: The Conceptualizer, the Formulator and the Articulator. Generating intentions and keeping track of the discourse are basically highly controlled except in casual daily conversations. Even when people speak their L1, conceptualizing demands careful thought and requires them to utilize attentional resources. Formulating and articulating, on the other hand, are usually automatic and call for very little controlled processing when people speak

their L1. When people speak an L2, however, these two processes demand them to carefully choose appropriate linguistic forms to realize their intentions linguistically. It is grammatical encoding that opportunities to produce the TL is likely to facilitate. L2 learners have to access lemmas stored in their mental lexicon in order to encode their intended messages. Through accessing lemmas, they think about the syntactic and morphological information of the relevant lexical items to realize their intended messages linguistically. It can be assumed that syntactic processing during output leads L2 learners to be more conscious of the syntax of the TL and makes them more sensitive to how lexical items should be used in sentences. Output practice may encourage L2 learners to understand in what patterns they have to use a certain lexical item and what lexical items or types of lexical items they have to use with a certain lexical item.

Greater automaticity is also created by output practice. Automaticity is defined as “the capacity to carry out an activity at high speed and without effort or attention” (Richards & Schmidt, 2002, p.43). The more automatic an activity becomes, the more attentional resources are left over for other purposes. Being automatic at one level enables L2 learners to use attentional resources for higher-level processes. For example, if a learner can handle the phonology and the syntax of an L2, more attention can be paid to processing semantic, pragmatic and sociolinguistic levels of communication. Automatic execution of certain aspects of L2 performance such as pronunciation, grammatical processing and word recognition promotes fluency. Output practice enhances fluency by turning declarative knowledge into procedural knowledge (de Bot, 1996). According to Anderson’s ACT-R (Adaptive Control of Thought-Rational) model, practice plays an important role in the transitional change of knowledge (Anderson, 1983, 1993). Language learning is seen as a type of skill learning in this model. Learning occurs sequentially through three stages of declarative, procedural and automatic knowledge. Declarative knowledge refers to explicit knowledge about a topic, as in knowing and talking about grammar rules. Procedural knowledge is implicit knowledge that refers to behavior, such as speaking or writing a language. It is obvious that there are different levels of proficiency in using a language, and thus automaticity is not an all-or-nothing affair.

Output practice is considered to develop learners' abilities in accessing their current knowledge system for fluent and accurate production. Even the researchers who have a negative view of a positive role of output practice to play in L2 learning agree that output practice enhances learners' fluency (for example, Cadierno, 1995; VanPatten & Cadierno, 1993a, 1993b).

2.6 Empirical Studies of the Effects of Output on L2 Learning

Although further research remains to be done to understand how producing output promotes L2 learning, several informative findings have been reported concerning whether output practice is effective for the development of L2 learners' IL system.

Four empirical studies will be reviewed which are necessary to understand that producing output constitutes part of the process of L2 learning and what roles and functions producing output has in L2 learning. The four empirical studies which will be reviewed here are: DeKeyser and Sokalski (1996), Kowal and Swain (1994), Izumi (2002) and Swain and Lapkin (2002). Before reviewing them, however, I will look at VanPatten and Cadierno (1993a, 1993b). Although they are not studies which tried to testify the Output Hypothesis, it is necessary to deal with their studies here because their claim triggered empirical studies to testify the effects of output in L2 learning.

2.6.1 VanPatten and Cadierno (1993a, 1993b)

According to VanPatten and Cadierno (1993a), output practice is useful because "learners need to develop their abilities in accessing the developing system for fluent and accurate production" (p.239), but this practice plays no role in developing that system itself. Therefore, they predict that performance on production tests will be as good for students who receive "processing instruction" (comprehension practice) as for those who are engaged in production practice. VanPatten and Cadierno (1993a, 1993b) intended to confirm the prediction. The target linguistic form investigated in their studies is Spanish direct object clitics.

In VanPatten and Cadierno (1993a), traditional form-focused instruction is compared with input processing instruction. While the former involves practice in production, the latter involves explanation and practice processing input data. The participants are first-year learners of Spanish in college. Their performance on sentence-level interpretation (comprehension) and production tasks was analyzed and the results suggest significant gains for the participants receiving the input processing instruction.

VanPatten and Cadierno (1993b) investigate the effects of two different types of instruction on the developing knowledge system of L2 learners: Output practice instruction and input processing instruction. While the former involves grammatical explanation and output practice, the latter involves explanation to draw the participants' attention to the target linguistic form and "structured input processing" which requires the participants to respond to the input data nonverbally. The results are: (1) The input processing group is better than the output practice group in recognizing the form-meaning relationship of the target linguistic form and (2) There is no statistical difference between the two groups in the ability to produce the target form.

Based on the results of their studies, they claim that input practice is better than output practice for comprehension skills and no worse than output practice for production skills.

2.6.2 DeKeyser and Sokalski (1996)

2.6.2.1 Background

This research was done to replicate VanPatten and Cadierno (1993a, 1993b) and to test the generalizability of their studies. DeKeyser and Sokalski (1996) have pointed out that VanPatten and Cadierno (1993a, 1993b) have two problems of internal validity and one problem of external validity.

The first internal validity issue is concerned with the amount of information which the input practice group and the output practice group received respectively. In their studies, the former received more information than the latter. It is likely that the difference in the amount of information provided to the participants influenced the results of the studies.

The second internal validity issue is concerned with attention to meaning. While the input practice group paid attention to meaning through comprehension exercises, the output practice group spent a substantial part of its practice time with mechanical drills. It is not likely that mechanical drills encourage learners to pay both meaning and form simultaneously. It means that the treatments for the two groups were fundamentally different. While the input practice group paid attention to both form and meaning, the output practice group paid attention only to form. The results of their studies might have been influenced by this difference.

The last problem is that VanPatten and Cadierno (1993a, 1993b) imply that the results of their studies are generalizable to all language structures. DeKeyser (1994) assumes, however, that the degree to which input and output practice are useful depends on relative complexity of target linguistic forms. A complex linguistic form, for example, may be easier to notice but harder to produce correctly than a simple linguistic form. A simple linguistic form, on the other hand, may be less noticeable but easier to produce correctly because of its simplicity. VanPatten and Cadierno (1993a, 1993b) employed Spanish direct object clitics as the target linguistic form. This linguistic form is considered to be easy to produce, yet difficult to comprehend for English speakers. It is probable that their choice of this linguistic form brought about their findings.

DeKeyser and Sokalski (1996) hypothesize that the Spanish conditional form of the verb is a structure that is easy to notice but difficult to produce for the native speakers of English. To learn the structure, they argue, learners need to have enough production practice and that merely being exposed to input does not lead them to increase their control of the target structure. The Spanish direct object clitics, on the other hand, can be learned successfully through comprehension practice rather than production practice.

Eighty-two undergraduate students learning Spanish took part in the study and they were put into four treatment groups and two control groups. Students who were repeating the same Spanish course, had previously studied Spanish at college or spoke another Romance language natively were excluded from

the study, which makes the results of the study more reliable. Table 2.2 shows the distribution of the participants over the six groups.

Table 2.2

Distribution of Participants

	Direct object clitics	Conditional
Control	11	11
Input practice	15	19
Output practice	10	16
Total	36	46

2.6.2.2 Hypothesis

Taking the above discussion into consideration, they formulated the following two hypotheses:

- (1) For the direct object clitic, after instruction the input practice group will improve significantly more than the output practice group on comprehension tasks and rival the output practice group on production tasks.
- (2) For the conditional forms of the verb, after instruction the output practice group will improve significantly more than the input practice group on production tasks and rival the input practice group on comprehension tasks.

2.6.2.3 Results and Discussion

The first hypothesis was confirmed partially. The results of the posttest seem to show the interaction predicted by Skill Acquisition Theory (Anderson, 1993): The input practice group was significantly better for comprehension tasks and the output practice group was significantly better for production tasks. The

results do not replicate VanPatten and Cadierno's (1993a, 1993b) finding that output practice does not make a difference for the production of direct object clitics. In DeKeyser and Sokalski (1996), output practice contributed to better control of the target linguistic form and the output practice group did well for production tasks.

The second hypothesis was also confirmed partially. For the conditional forms of the verb, the output practice group was better than the input practice group for both production and comprehension tasks. They found an overall advantage for output practice for the conditional forms of the verb as they had predicted.

Although they state that the results of their study cannot be generalized, their findings have the important pedagogical implication that specific practice is necessary for different skills in L2 learning. To comprehend input, L2 learners need practice comprehending input; to produce, they need practice producing. Transfer from one skill to the other is limited.

2.6.3 Kowal and Swain (1994)

2.6.3.1 Background

Producing output is considered to help L2 learners move from a semantic type of processing required in comprehension to a more syntactic form of processing needed for production. Results from immersion programs show, however, it is not simply enough to provide learners with opportunities for speaking and writing. Advanced learners, for example, usually have developed high levels of strategic competence (Canale & Swain, 1980; Tarone, 1981) and as a result, the growth of their IL system slows down if deliberate attempts are not made to draw their attention to how they are realizing their intended messages linguistically (Swain, 1988, 1993).

Kowal and Swain (1994) believe that to present a message and a linguistic code in a dichotomous relationship is to ignore the fundamental communicative function of many grammatical forms. A communicative task in which learners communicate about grammar is desirable. Concerning this point,

Fotos (1993) suggests that talking about grammar raises learners' consciousness, which may help them develop their knowledge on grammatical structures. Lightbown and Spada (1990) also suggest that raising learners' consciousness of grammatical forms can facilitate the development of their IL system.

Tasks which require L2 learners to produce extended output may lead them to reflect on how they can produce language accurately. As a result, they may gain control of their own language production abilities.

This research was designed to focus on L2 learners' process of learning an L2. It presents data of 13 and 14 year old intermediate and advanced learners of French working collaboratively to complete a text reconstruction task. The number of the participants was 19 and the task which was employed was a modified version of the dictogloss technique (see Wajnryb, 1990, for dictogloss technique).

2.6.3.2 Hypothesis

Kowal and Swain (1994) have hypothesized that a collaborative text reconstruction task where learners are required to produce output would promote their language learning by (1) Making them aware of gaps in their existing knowledge which they would subsequently seek to fill, (2) Raising their awareness of the links between the form, function and meaning of words as they work to construct their intended message and (3) Obtaining feedback that they would receive from their peers and their teachers as they complete the task.

2.6.3.3 Results and Discussion

The results basically support the hypothesis. Learners notice the gap between what they want to say and what they are able to say when they try to produce the TL, which encourages them to search for a solution. A collaborative task enables them to work together to solve their linguistic difficulties, making linguistic forms the focus of their discussion.

The participants in Kowal and Swain (1994) actually drew their attention to linguistic forms such as

vocabulary, morphology and complex syntactic structures. By verbalizing their problem, they were given opportunities to reflect on language. As a result, they stretched their IL system.

This research basically shows that the production of extended output is likely to promote L2 learning and that a collaborative text reconstruction task is effective in encouraging L2 learners to reflect on linguistic forms. It is important to draw L2 learners' attention to how they are realizing their intended meaning linguistically so that they can keep on developing their IL system.

Kowal and Swain (1994) also point out that different learners at different ages and different levels of proficiency might have identified and dealt with an entirely different set of linguistic problems. What gaps learners notice and how they manage them is basically up to each of them. This is where further research is necessary. Learners' proficiency levels, for example, are likely to influence what they notice and how they deal with them. This needs to be clarified from now on. It is also necessary to show empirically what linguistic forms L2 learners acquire by means of focus on form stimulated by the need to produce the TL accurately.

2.6.4 Izumi (2002)

2.6.4.1 Background

Izumi (2002) emphasizes the importance of attention and output in L2 development. As for the role of attention in L2 development, general findings of research in cognitive psychology and L2 learning indicate that attention is necessary for learning to take place (Robinson, 1995; Schmidt, 1990, 1995) and that "there is little if any learning without attention" (Schmidt, 2001, p.16).

Concerning the importance of output, he states that producing output may lead learners to become more sensitive to what they can and cannot say in the TL. If relevant input is provided in a timely manner, he continues, the heightened sense of problematicity during output may prompt the learners to examine the input with more focused attention, which in turn may bring about more learning of linguistic forms.

Izumi, Bigelow, Fujiwara and Fearnow (1999) and Izumi and Bigelow (2000) investigated whether

the act of producing language would encourage learners to notice a problem and be primed to notice a linguistic form in relevant input provided after producing output. Focusing on the past hypothetical conditional, these two studies compared the group that was given output opportunities and subsequent exposure to relevant input and the group that received the same input for comprehension. Though these studies produced mixed findings, the results seem to suggest that opportunities of producing extended output and exposure to relevant input after producing output are important in effecting steady L2 learning.

Based on the findings of these two studies, Izumi (2002) investigates the effects of producing output and visual input enhancement on the acquisition of English relative clauses by adult learners. He states that it is necessary to investigate how output practice may be combined with other focus-on-form techniques to promote greater learning and that the effects of producing output need to be investigated with other linguistic forms.

Sixty-one adult learners of English took part in the study and they were put into four treatment groups and one control group. The treatment groups were different in regard to output requirement (notated as $\pm O$) and exposure to enhanced input (notated as $\pm IE$). The first group was required to produce output and was exposed to regular, unenhanced input (+O-IE). The second group was required to produce output and received enhanced input (+O+IE). The third group received enhanced input without output (-O+IE). The fourth group received regular, unenhanced input without output (-O-IE).

2.6.4.2 Hypothesis

Based on the above discussion, the following seven hypotheses were formulated:

- (1) The noticing of the target form in the input would be greater for the output subjects than for the nonoutput subjects.
- (2) The noticing of the target form in the input would be greater for subjects receiving enhanced input than for those receiving unenhanced input.

- (3) The noticing of the target form in the input would be greater for +O+IE subjects than for +O-IE subjects and -O+IE subjects.
- (4) Output subjects would demonstrate greater learning of the target form than would nonoutput subjects.
- (5) Subjects receiving enhanced input would demonstrate greater learning of the target form than would subjects receiving unenhanced input.
- (6) +O+IE subjects would demonstrate greater learning of the target form than +O-IE and -O+IE subjects.
- (7) By virtue of their attention-drawing effects, the two conditions of +O-IE and -O+IE would produce a comparable amount of noticing and learning.

The first and the second hypotheses are concerned with noticing and the logical inference of the two hypotheses formulates the third hypothesis.

The fourth through sixth hypotheses are concerned with acquisition. If noticing is necessary to learn the form, it should follow that more noticing leads to more learning.

The last hypothesis is based on the inference that, if noticing is induced, how it is induced does not make little difference in the learning outcomes.

2.6.4.3 Results and Discussion

Of the seven hypotheses, the second and the fourth hypotheses were supported. The results of this study are informative in understanding how producing output and exposure to enhanced input contribute to the process of L2 learning respectively. While the latter is effective in inducing learners' noticing of the target form, the former brings about learning of the target form more effectively. That is, the participants who produced output on their own took more target forms into their L2 system and the participants who were exposed to enhanced input noticed more target forms.

What is particularly informative is that the exposure to enhanced input did not result in effective learning of the target form in spite of the fact that it was an effective technique in inducing learners'

noticing of the target form. Compared with the exposure to enhanced input, producing output contributed to more learning of the target form though it did not induce learners' noticing as effectively as the exposure to enhanced input.

After concluding that the output participants successfully learned the target form without sacrificing comprehension, Izumi (2002) explains why those engaged in producing output outperformed those exposed to the same input for the sole purpose of comprehension. One of the differences between input enhancement and output is that, whereas attention in the former is induced by an external means, attention in the latter arises internally through the production processes. Producing output, as an internal priming device, is likely to place learners in an ideal position to make a cognitive comparison between their own output and the target forms. Noticing the mismatches between learners' output and the target form is induced not by exposure to enhanced input but by producing output.

In cognitive psychology, perception involves the rapid analysis of stimuli at a number of levels and an analysis at a deeper level contributes to establishing a more durable memory trace (Craik & Lockhart, 1972). For linguistic forms to be incorporated into L2 learners' IL system successfully, they need to be analyzed at a deeper level. In this study, the output group resulted in greater learning than the input enhancement group. This implies that producing output triggered deeper and more elaborate processing of the form. The findings of this study suggest that producing output leads L2 learners to analyze linguistic forms at a deeper level than comprehending input, which in turn results in the incorporation of more linguistic forms into their IL system.

2.6.5 Swain and Lapkin (2002)

2.6.5.1 Background

This study documents the importance of collaborative dialogue as part of the process of L2 learning. Swain and Lapkin (2002) regard output not as a message to be conveyed, but as a tool in a cognitive activity. Metatalk, or a talk about language, is considered to mediate language learning (Lantolf, 2000;

Swain, 2000) and support the process of internalization (Lantolf, 2001). Metatalk is defined as “the language used to analyze a language or to reflect consciously on language use” (Richards & Schmidt, 2002, p.329).

Vygotsky (1986) has argued that what is needed for learning to occur is the presence of a more knowledgeable person who helps the learner move from being able to do something only with the help of that expert to being able to do it independently. The more knowledgeable other has typically been conceived of as an adult, such as a parent and a teacher. Recently, however, the idea that peer-peer interaction may also foster learning has been advanced (Tudge, 1990). For example, DiCamilla and Anton (1997) have emphasized the importance of co-constructed scaffolded support and guidance through a peer dialogue. A peer dialogue, if its relationship is collaborative, is likely to result in co-construction, extension of knowledge, provision of scaffolded assistance and language development (Storch, 1999a, 1999b).

The two participants in this study were in a grade seven French immersion class, having been in a French immersion program since kindergarten. They had been told that the researchers wanted to know their opinions about the usefulness of various activities as an aid to learning French. In the final interviews, the participants told the researchers what they liked and did not like about the activities in which they had participated. The talk of the learners and their individual interviews were transcribed and then coded for language-related episodes (LREs). In total, the two participants produced 91 LREs. In the posttest, the two participants were given a typewritten copy of their original story and asked to make changes if they wanted and they worked independently.

2.6.5.2 Research Questions

This study investigated the following two questions.

- (1) What do students notice while comparing a story they wrote in their L2 to a native-speaker reformulation of it? Do they accept or reject the changes made to their story? For what reasons?

(2) Do the participants make revisions to their original stories (an indication that learning occurred) based on the reformulation and their collaborative dialogues?

2.6.5.3 Results and Discussion

This study shows that reformulating learners' writing is an effective technique for triggering noticing and reflection on language. During the task, the two participants were given numerous opportunities for collaborative dialogues. During the collaborative dialogues, they noticed most of the differences between their original story and the reformulated text by a native speaker. They accepted or rejected the reformulated parts. Overall, they accepted 65% of the reformulations and rejected 35% of them.

What should be stressed here is that rejecting the reformulated parts does not necessarily mean that no learning occurred. There were two main reasons for them or either of them to decide to reject the authority of the reformulated parts.

The first reason is concerned with the power of internalized rule to prevail. When the participants saw no reason to give up their rule, the reformulated parts were not accepted. This was typically shown in one of the participants' words. The participant said, "I thought some of the corrections were not necessary."

The second reason is concerned with the participants' adherence to their intended meaning. When the reformulation changed the participants' intended meaning, they were unwilling to accept it. During the interview, one of them said, "Some of the reformulations seemed like they changed the story sort of and it wasn't really ours."

The posttest shows that 80% of the participants' changes were correct. Of those, approximately two-thirds corresponded exactly to the reformulation, a third were an acceptable alternative. Three quarters of their responses were correct when they accepted the reformulation. It is interesting to note that approximately three quarters of their responses were also correct when they rejected the reformulation. Swain and Lapkin (2002) assert that both acceptance and rejection of the changes by a native speaker led

to an internal process called “talking it through,” which served as reflection on language and mediated internalization of linguistic forms.

That the participants produced the target forms in the posttest suggests that they were ready for the feedback provided by the reformulated text. That is, the feedback was in their zone of proximal development (ZPD).

2.7 Output in English Language Learning

Four empirical studies were reviewed which tried to clarify the influences of producing output on L2 learning. They all agree in that the act of producing language (speaking or writing) constitutes part of the process of L2 learning. This is exactly what the Output Hypothesis claims. It should also be noted that the processes involved in output can be quite different from those involved in comprehension. As comprehension allows L2 learners to resort to external cues such as contextual information and inference, they can decode messages quite successfully without paying much attention to the details of linguistic forms. Producing output, on the other hand, requires them to be more careful about the details of linguistic forms because they cannot resort to external cues during output. While vague knowledge on linguistic forms is enough for comprehension, definite and precise knowledge on linguistic forms is indispensable for producing output. While trying to realize their intended messages linguistically, L2 learners are sometimes forced to move to syntactic processing in order to make their utterances accurate and comprehensible. In trying to retrieve their linguistic knowledge to realize their intended messages linguistically, L2 learners may notice that they cannot formulate their preverbal messages accurately because of their limited linguistic repertoire. This leads them to identify areas where their IL system is limited and needs extensions, which plays a crucial role in encouraging L2 learners to incorporate relevant linguistic forms into their IL system if they are offered in a timely manner.

As mentioned in 1.1, L2 learners' IL system is most likely to change when they realize their lack of linguistic knowledge (Tarone & Liu, 1995). It is understandable that L2 learners are likely to incorporate

new linguistic forms into their IL system when they realize that the forms are missing in their IL system.

One may argue that L2 learners can realize that a certain linguistic form is missing in their L2 system without producing output. It is possible that exposure to input is also effective in triggering L2 learners' noticing. When they are exposed to reading materials, for example, L2 learners are likely to notice new lexical items and new grammatical structures. What matters here is not noticing itself but the quality of noticing. While attention in comprehension is induced by an external means, attention in producing output arises internally through the production processes.

Output, which is an internal priming device, is considered to trigger cognitive processes that may be necessary for IL development. A cognitive comparison between IL and TL forms, for example, is probably made possible by output, but not by comprehension. People gain new knowledge through hypothesis testing, which is considered to be observed more in producing output than in comprehending input (Swain, 2000).

Although one cannot deny the importance of producing output in L2 learning, further research remains to be done to elucidate how learners' output contributes to the development of their IL system. As Swain (2000) has pointed out, "Output might theoretically play several roles in second language learning. Relative to the potential roles of input in second language learning, those of output have been relatively underexplored" (p.99). The present study considers that the following two research areas are of particular interest and importance.

One is concerned with what linguistic forms L2 learners are likely to incorporate into their IL system by virtue of output. It is generally agreed that the proceduralization of existing linguistic knowledge is facilitated by producing output. Traditional foreign language teaching methodology considers that output, or practice in production, is necessary for the gradual proceduralization of explicitly learned knowledge (Chastain, 1971; Paulston & Bruder, 1976; Rivers & Temperley, 1978). Even the researchers who do not admit positive roles of producing output in IL development accept the notion that producing output is useful because "learners need to develop their abilities in accessing the developing

system for fluent and accurate production” (VanPatten & Cadierno, 1993a, p. 239).

Output practice is necessary to proceduralize L2 learners’ existing knowledge. It is assumed that they gradually expand processing space and free attentional capacity by accessing their existing knowledge for production repeatedly (Pienemann & Johnston, 1987), which brings about the improvement of fluency.

What needs to be clarified is whether producing output contributes to the stretching of learners’ IL system itself. Researchers have not reached agreement on this point. While some argue that output practice contributes to the incorporation of new linguistic forms (for example, de Bot, 1996; DeKeyser & Sokalski, 1996; Izumi, 2002; Swain & Lapkin, 2002), others claim that this practice plays no role in developing L2 learners’ IL system (for example, Krashen, 1985; VanPatten & Cadierno, 1993a, 1993b). Other researchers take an intermediate point of view. R. Ellis (1993, 1994), for example, agrees with both VanPatten and Cadierno (1993a, 1993b) and Swain and Lapkin (1995) partially.

According to the empirical studies mentioned above (DeKeyser & Sokalski, 1996; Izumi, 2002), the ability to use such complicated grammatical structures as relative clauses and conditional forms of the verb accurately is developed efficiently through output practice because learners are forced to pay attention to the details of linguistic forms. For learners to acquire a good command of such complicated grammatical structures, output practice is indispensable.

Does output practice bring about the incorporation of new linguistic forms? If yes, what linguistic forms are incorporated into L2 learners’ IL system? By answering these questions, language teachers can gain practical insight into how and with what purposes output practice should be implemented in class. For example, it is of interest to clarify whether lexical learning is facilitated through output practice. Lexical items usually play a central role in communication (Poulisse, 1990).

The other is concerned with L2 learners’ proficiency in the TL. Do all learners benefit equally from output practice irrespective of their L2 proficiency level? Learners with low proficiency who are having difficulty in producing one-word utterances may not be able to move to a syntactic mode during

production because their cognitive effort is spent primarily on the retrieval of lexical items (Bygate, 1999). If all they can do is to pay attention to individual lexical items, such learners are not likely to attend to grammatical forms in either the output they produce or the input they receive.

Iwanaka (2008a), making use of a learner corpus called NICT JLE Corpus,³⁾ has clarified how Japanese EFL learners' ability to reformulate utterances develops as their proficiency in the TL improves.

Figure 2.4 illustrates the process of utterance reformulation.

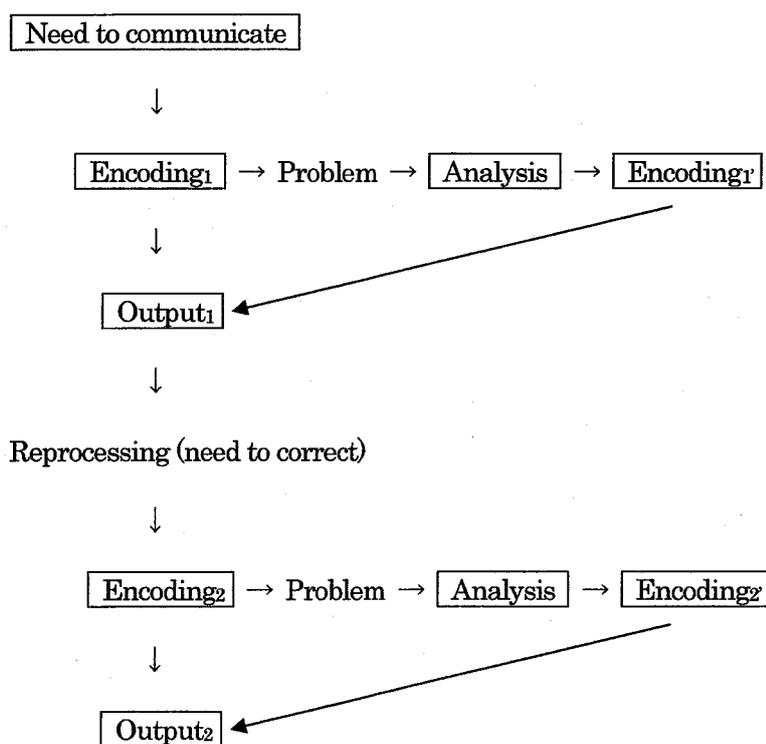


Figure 2.4 A process of utterance reformulation (Iwanaka, 2008a, p.15)

While learners with high proficiency can reformulate their utterances successfully with their ample linguistic resources, learners with low proficiency have difficulty in generating their first output, or “Output₁” in the figure. It should be noted that they cannot arrive at a stage where their first output is reprocessed. The minute analysis showed that learners with low proficiency were likely to give up realizing their intended message linguistically and resorted to their L1 in quite a few cases. Even when

they were able to put their intended meaning into English, utterances in which they were just enumerating lexical items which they were able to retrieve were abundant. This suggests that they were not able to think about how a lexical item should be used in a sentence.

It is not realistic to expect all learners of English to benefit equally from output practice irrespective of their L2 proficiency level. It is necessary to take learners' developmental readiness into consideration. Although it is quite sure that "what goes on between the original output and its reprocessed form is part of the process of second language learning" (Swain & Lapkin, 1995, p.371), it should also be noted that learners with low proficiency have difficulty in realizing their intended meaning linguistically because of their limited linguistic resources and limited access to the resources. Though it is certain that producing output has its own roles and contributes to L2 learning in its own way, it can not be considered as a cure-all for all L2 learners. How much benefit L2 learners can gain from output practice may depend on their proficiency in the TL.

Learners need to be "pushed" beyond their current level of IL and the importance of producing output in L2 learning is that producing output pushes learners to process language which they are using more deeply – with more mental effort – than does comprehending input. It should be stressed that producing output can be seen not as a product of learning, but as an active component in L2 learning.

Notes

- 1) This is triggered by noticing a hole.
- 2) Noticing the gap cannot always be separable from noticing a form because the latter usually involves the former.
- 3) This learner corpus, whose official name is the National Institute of Information and Communications Technology Japanese Learner English Corpus, was developed by the National Institute of Information and Communications Technology and ALC Inc. and became available in 2004.

Chapter 3

Noticing in English Language Learning

Whether learning is driven consciously or unconsciously has been a controversial topic for second language (L2) researchers. The first researcher that introduced the research findings of psychology into the studies of second language acquisition (SLA) is Schmidt (1990), who claims that what is noticed becomes intake which is necessary for L2 learning. He hypothesizes that noticing is a necessary condition for L2 learning. This is called the Noticing Hypothesis.

Although noticing is generally considered to be a necessary component for L2 learning (R. Ellis, 1994), opinions differ as to whether it is indispensable for L2 learning or not. There are quite a few researchers who believe that conscious understanding of the target language (TL) system is necessary if learners are to use linguistic forms correctly and appropriately. For example, Peters (1998) has proposed that in every domain of language learning, learners must attend to and notice any source of variation that matters. Several other researchers have also argued that learning without awareness is impossible (for example, Brewer, 1974; Lewis & Anderson, 1985).

On the other hand, however, there are also many who believe that language learning is essentially unconscious. Seliger (1983), for example, has claimed that it is at the unconscious level that L2 learning takes place. Krashen (1981, 1983, 1985) also belongs to this group and has asserted that conscious learning is of little use in actual language production and comprehension. Gregg (1984), who harshly opposes Krashen's claim that "learning" can never become "acquisition," agrees that most L2 learning is unconscious. Bruner (1992) also assumes that unconscious processes do everything.

Connectionists consider that learning results from the strengthening and inhibition of connections in an associative network (Elman, Bates, Johnson, Karmiloff-Smith, Parisi & Plunkett, 1996). They also think that learning takes place at an unconscious level.

It is plausible that both conscious learning and unconscious learning surely exist and that they both contribute to L2 learning respectively. Although the existence of unconscious learning cannot be denied completely, conscious learning, or attended learning, is assumed to have a role of greater consequence in L2 learning. It should be noted that paying attention to form is facilitative and necessary if learners are to learn redundant grammatical forms and to acquire the ability to produce them correctly.

This chapter will first review attention, consciousness and noticing to elucidate the relationship between them. It will then review the Noticing Hypothesis. Although it is a fascinating hypothesis for L2 researchers and teachers, it has also drawn criticism from some researchers (for example, Tomlin & Villa, 1994; Truscott, 1998). It is necessary to review the details of their criticism and to confirm the validity of the hypothesis. Then, focus-on-form activities, in which attention-drawing devices are employed to facilitate L2 learning, will be reviewed. It is finally suggested that L2 learning is mainly driven by what learners pay attention to and notice in TL input.

3.1 Attention, Consciousness and Noticing

As these three concepts are closely related, it is necessary to look at attention, consciousness and noticing respectively and to make the relationship between them clear.

3.1.1 Attention

Attention (voluntary or involuntary) to the material to be learned is considered to be crucial in L2 learning. Attention is the ability a person has to concentrate on some things while ignoring others. According to Richards and Schmidt (2002), subsystems of attention include alertness (an overall readiness to deal with incoming stimuli), orientation (the direction of attentional resources to certain types of stimuli), detection (cognitive registration of a particular stimulus) and inhibition (deliberately ignoring some stimuli). In SLA theory, it has been proposed that nothing can be learned from input without it being the object of some level of attention. It is agreed that the ability to direct and focus cognitive activities on specific stimuli for a

period of time is necessary for L2 learning. What is controversial is whether such discernment must be conscious or not.

As the concept of attention is necessary for understanding nearly every aspect of L2 learning, it is necessary to provide basic information concerning attention. The basic assumptions on attention are: It is limited, it is selective, it is partially subject to voluntary control, it controls access to consciousness and it is essential for learning. The next part will look at each of them in some detail to understand what attention is, consulting Schmidt (2001).

3.1.1.1 Attention Is Limited

The classic view of attention is that it has limited capacity (Kahneman, 1973) and this view has been employed by many in SLA (for example, McLaughlin, Rossman & McLeod, 1983; VanPatten, 1994). Within this general view, Wickens (1984, 1989) has assumed that the limited capacity of attention includes specific resource pools for specific modalities (visual, auditory, vocal and manual). It means that attention-demanding activities can be carried out at the same time more efficiently if they exercise different modalities than if they make use of the same modality. Each resource pool had been assumed to have limited capacity, which Miyamoto (1998) proved empirically. It is generally known that there are two different ways in which humans analyze and process language as part of comprehension and learning. One is known as top-down processing and the other is known as bottom-up processing. They are assumed to make use of the same modality as they are both concerned with language understanding. Miyamoto (1998) showed empirically that there was a trade-off between top-down processing and bottom-up processing. When one exercises with higher efficiency, the other is likely to become less efficient.

3.1.1.2 Attention Is Selective

As there is limited supply of attention and it must be shared by any activity that requires it, attention must be strategically allocated. In most L2 learning context, the meaning of messages is the most important

(VanPatten, 1990). This is why limited attentional resources are directed first to lexical items. In most L2 learning context, understanding meaning is important and lexical items usually carry message meaning. This explains why attentional resources are directed to communicatively redundant formal aspects of language later (Lee, Cadierno, Glass & VanPatten, 1997).

Some researchers consider that being selective is the basic function of attention and place more importance on selection than other characteristics. Bialystok (1994), for example, has emphasized that being selective rather than being limited is the primary characteristic of attention.

3.1.1.3 Attention Is Subject to Voluntary Control

One of the important functions of teaching is to help learners focus their attention on linguistic forms in input. If it is possible to control the focus of attention, L2 teachers can guide their learners to pay attention to different aspects of the TL in class. They can tell their learners to pay attention to different aspects, such as pronunciation, lexical items, syntax, discourse structuring and so on (Hulstijn & Hulstijn, 1984).

There is of course an involuntary form of attention as well. For example, it sometimes happens that one cannot help attending to a loud noise whether one wants to or not. While involuntary attention is controlled by outside events and beyond one's will, voluntary attention can be directed to a certain part by an inner intention.

3.1.1.4 Attention Controls Access to Consciousness

One of the roles of attention is to control access to consciousness. Attention is viewed as the mechanism responsible for access to awareness (Baars, 1996). Attention selects stimuli and the selected stimuli are represented in conscious awareness.

Selection is the mechanism that moves information from one stage of processing to the subsequent stage. Selection is based on competition and all stimuli compete for access to consciousness. Only strongly activated stimuli enter consciousness and are subject to further processing while other stimuli

remain unconscious and are lost. Attention is in charge of the process and thus controls access to awareness.

3.1.1.5 Attention Is Essential for Learning

It is generally agreed in psychology that there is little if any learning without attention. While unattended stimuli are kept in short-term memory for only a few seconds and not available for future use, attended stimuli stay in long-term memory and are available for future use. Carr and Curran (1994), for example, regard attention to be responsible for making input available for further mental processing. Gass (1988) considers that an attended part gets processed to be comprehended and in turn is converted into intake (see Figure 1.1).

3.1.2 Consciousness

The term *consciousness* is used to refer to personal recognition of both stimuli in input and of one's own mental processes. Schmidt (1990, 1993, 1995) divided consciousness into three categories: Consciousness as awareness, consciousness as intention and consciousness as knowledge. The first category is thought to have three levels: Perception, noticing and understanding. What should be noted here is that perception does not necessarily accompany subjective awareness.

The term *detection* is worth a mention here. As discussed in 3.1.1, it is one of the subsystems of attention. The term is used to refer to cognitive registration of a particular stimulus without subjective awareness (Richards & Schmidt, 2002). What is important here is whether detection is enough to bring about learning or not. Tomlin and Villa (1994), for example, argue that detection is the necessary and sufficient condition for further processing and learning. They assume that L2 learning is possible without noticing. It can be considered that they use the term *detection* to refer to the term *perception* in Schmidt's term. Both of them occur at a subliminal level. Figure 3.1 illustrates the relationship between the three levels of consciousness and detection.

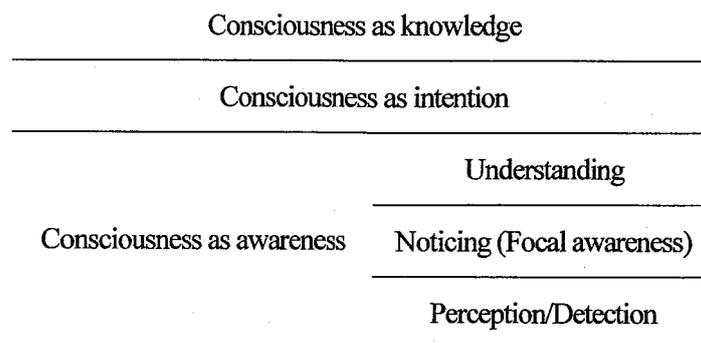


Figure 3.1 Three levels of consciousness and detection

The Noticing Hypothesis (see 3.2. for further details) claims that consciousness at the level of noticing is necessary for L2 learning.

Consciousness-raising toward form has been regarded to be meaningful in L2 learning and various activities have been proposed. Exposure to a material with some aspects highlighted, inferring grammatical rules from examples, comparing two or more different ways of saying something and observing differences between learners' own linguistic realization and its counterpart in model input all constitute consciousness-raising activities. These techniques are intended to avoid inefficiency of learning which tends to occur in a context where L2 learners are primarily concerned with meaning.

Attempts by adults to learn an L2 incidentally through communicative interaction are considered to be only partially successful. Concerning this issue, Skehan (2002) has observed that "In the pre-critical period phase, there is inexorable involvement of a language learning system on exposure to primary linguistic data, whereas this no longer occurs in such an obligatory way in post-critical period phase" (p.87). This explains why adult learners cannot learn an L2 as successfully as children in naturalistic environments. It can be concluded that raising consciousness toward form is indispensable for adult learners to develop their IL system efficiently.

3.1.3 Noticing and Factors Influencing Noticing

Noticing is to assign significance to some aspect of form relative to others. It is considered to be one

degree of awareness. It refers to private experience which is brought about by drawing learners' selective attention to a certain linguistic form. Schmidt (1990) argues that noticing is necessary for input to become intake, that is, necessary for L2 learning. Schmidt (2001) further defines that the minimum requirement of noticing is to pay attention to key grammatical elements in input with greater than a threshold level of subjective awareness (that is, reportable subsequent to the experience). Noticing is thus "subjective correlate" (Schmidt, 2001, p.5) of attention.

There are several terms for what Schmidt calls noticing. They are, for example, "focal awareness" (Atkinson & Shiffrin, 1968), "episodic awareness" (Allport, 1979) and "apperceived input" (Gass, 1988). What these terms have in common is that they all identify the level at which stimuli are subjectively experienced. That is, noticing can be seen as learners' detection with subjective awareness plus rehearsal in short-term memory (Robinson, 1995).

If noticing reflects a learner's private experience, it can be influenced by several factors. As Schmidt (1990) has suggested, "L2 learners are not free to notice whatever they want whenever they want and a number of factors influence noticeability" (p.144). The present study assumes that there are two primary factors which influence noticeability: Learner characteristics and perceptual salience of linguistic forms.

Frequency of forms and perceptual salience of forms, for example, are considered to influence learners' noticing. When L2 learners process input, lexical items have priority over grammatical morphologies and more meaningful morphologies have priority over less meaningful morphologies (VanPatten, 1992). Whether learners have partial knowledge on a target form or not is another decisive factor. The partial knowledge on the form can function as scaffolding when learners process the noticed form for comprehension.

As for learner variables, Skehan (2002) considers that working memory capacity and attention management are aptitude components for noticing. Concerning working memory capacity, Mackey, Philip, Egi, Fujii and Tatsumi (2002) examined the relationship between working memory capacity and noticing. The statistical analysis indicated that the relationship between learners' reports of noticing and

their working memory scores was significant. In their study, most learners who reported more noticing also had higher working memory scores.

Although it is difficult to measure L2 learners' ability to manage attentional resources objectively, the ability is considered to be evaluated indirectly by observing their TL proficiency to some extent. For L2 learners to notice linguistic forms, it is necessary to have spare attentional resources. Beginning learners are cognitively overloaded because of both their limited linguistic resources and their inefficient access to them. As their command of the TL improves, they have more attentional resources available and come to be better able to notice linguistic forms. As for learners' proficiency in the TL, Kimura (1999) has pointed out that learners' proficiency is more likely to influence their use of learning strategies than other variables such as gender, personality and learning style. Concerning noticing as well, learners' proficiency is considered to be quite influential because L2 learners have more attentional resources available as their proficiency in the TL improves. Whereas learners with low proficiency are likely to fail to notice less salient linguistic forms and what lexical items a lexical item in question is expected to collocate with because of their limited attentional resources, learners with high proficiency, who have wealth of knowledge on the TL, are likely to notice less salient linguistic forms.

Leow (1997) has analyzed think-aloud protocols produced by learners of Spanish completing an L2 crossword puzzle and put noticing into two levels: Simple noticing and noticing with metalinguistic awareness. Noticing with metalinguistic awareness is at a higher level of awareness than simple noticing. The result of the study has shown that the former brings about more learning than the latter. Although Leow (1997) is an informative study, it has failed to distinguish noticing and processing subsequent to noticing. These two are different and should be dealt with as independently as possible.

Noticed forms are processed by L2 learners for comprehension. It is necessary to note that all noticed forms do not necessarily receive further processing. While some are processed for comprehension, others are lost without being processed. This decision is basically made by learners. The model depicted in Figure 3.2 explains how a noticed form is processed and incorporated into L2 learners' IL system once

they decide to do so.

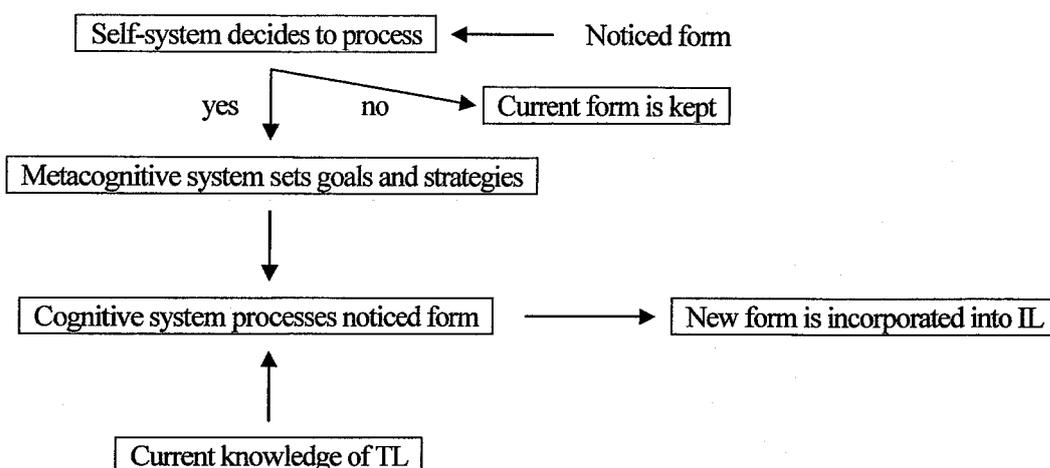


Figure 3.2 A model of processing (Based on Marzano's (2001) Model of behavior)

Assume that an L2 learner decides not to process a noticed form. The noticed form is kept in the learner's memory only for a short period and soon lost. In this case, IL development cannot be expected. If the learner feels it necessary to process the noticed form, the learner's cognitive system processes it and the processed form is likely to be kept in the learner's memory. As Figure 3.2 shows, L2 learners make use of their currently held linguistic knowledge to process the noticed forms. The more knowledge a learner has, the more elaborate the learner's processing is. The extent to which learners process the noticed forms would to a great extent depend on their prior knowledge on the TL. The success of the processing of the noticed forms is highly dependent on the amount of knowledge an individual learner has on the TL (Lindsay & Norman, 1977). Learners with ample TL knowledge are better able to notice a form and better able to process the noticed form.

Skehan (1998, 2002) has suggested that the ability to notice what is in input is one of three factors in foreign language aptitude and that noticing is the first SLA processing stage. Although the possibility of unattended learning cannot be denied completely, it can be concluded that noticed forms in input are likely to be processed deeply enough to be incorporated. As was previously mentioned, there are several factors

which influence learners' noticing. There seem to be four factors which are of particular importance.

If other factors are equal, the more frequent a linguistic form is, the more likely it is to be noticed and then incorporated into learners' IL system. If learners are exposed to a certain linguistic form more often than others, the linguistic form is more likely to attract their attention than other linguistic forms. There is no room for doubt that frequency is one of the primary factors which influence noticing.

Perceptual salience is another factor which influences noticing. It concerns how prominent a linguistic form is in input. Other factors being equal, the more prominent a linguistic form is, the more likely it is to be noticed. All linguistic forms are not equally salient. New lexical items, for example, are more noticeable than grammatical forms. Learners' attentional resources are first drawn to such content words as nouns, verbs and adjectives. It should be noted that less perceptually salient forms are less likely to be noticed unless a device to direct learners' attention is implemented.

As Skehan (1998) has suggested, input contains many alternative features for processing. Learners need to extract relevant aspects of linguistic forms to be focused upon. The role of teachers' intervention is to channel attention and bring into awareness what otherwise would have been missed. In this respect, teachers' intervention can be considered to be another factor to influence noticing. Teachers can direct their students to pay attention to different aspects of input. Focus-on-form instruction is considered to be a good example. In accordance with the Noticing Hypothesis, its essential idea is that aspects of L2 input learners need to notice, but do not for some reasons, will require some kind of pedagogical intervention. The detailed discussion of focus-on-form instruction will be given in 3.5.

The fourth influence on noticing is the current state of learners' IL system, which represents their readiness to notice. Schmidt (1990) has claimed that noticing depends on each learner's readiness. If they have not learned what is simple and easy to notice, they cannot learn what is complex. As what is simple is learned enough, the processing gets automated and they have more capacity to attend to the details of linguistic forms. Eventually, they come to be able to attend to whatever native speakers pay attention to.

Although all the four factors mentioned above are considered to be equally important, the present

study is primarily concerned with how perceptual salience of linguistic forms and the current state of learners' IL system influence noticing.

As for the influence of frequency on noticing, the result seems quite self-evident. The more frequent a linguistic form is, the more likely it is to be noticed by learners. As a result, the noticed linguistic form undergoes further processing by learners and has more possibilities of being incorporated into their IL system.

As discussed in 1.1, the present study is primarily concerned with clarifying how the output-input activity influences the IL development of Japanese learners of English. A comparison of instruction types in order to clarify how each instruction type influences noticing lies outside the scope of the present study.

3.2 The Noticing Hypothesis

Schmidt's Noticing Hypothesis comes from his own experiences as a learner of Portuguese. While learning Portuguese, he realized that certain linguistic forms began to enter his own IL system only when he noticed them. Drawing on psychological learning theories, he has hypothesized that L2 learners can not begin to acquire a linguistic form until they become aware of it in input.

The Noticing Hypothesis claims that SLA is largely driven by what learners pay attention to and notice in TL input and what they understand the significance of noticed input to be (Doughty, 2003). The basic claim is that input does not become intake for L2 learning unless it is noticed, that is, consciously registered. As discussed in 1.1, there are three types of noticing (Swain, 2000): Noticing a hole, noticing a form and noticing the gap.

Schmidt and Frota (1986) first emphasized the importance of noticing in L2 learning. They have claimed that if a learner is to learn and use a particular type of verbal form, it is not enough for it to have been taught and drilled in class and that it is also not enough for the form to appear in input. They have argued that conscious awareness of what is present in input, or noticing, is necessary for a learner to be able to use it. They have reported the results of a diary study in which there are so many instances of L2

use matching the learners' reports of what was noticed while interacting with native speakers. This can be taken to support the hypothesis that there is no L2 learning without noticing. Making diary entries requires not only noticing but also reflexive self-awareness (awareness that one has noticed). Schmidt (1990) discusses the evidence from his own learning of Portuguese in support of the hypothesis that intake is the subset of input that is attended to and noticed.

When meaning-processing predominates, form becomes optional which often loses out to meaning. Schmidt (1990, 1993, 1994, 1995, 2001) has emphasized the importance of noticing and argued that L2 learners need to direct attention to some aspects of input. Aspects of form which need to be developed have to be noticed consciously.

Learning is closely related to memory. It has been established empirically that memory requires attention and awareness. Cherry (1953) is a classic study into the cognitive system's ability to deal with competing auditory input. The result suggests that while an attended material is processed into long-term memory, an unattended material is kept in short-term memory for a short period and lost unless an opportunity to selectively attend to and notice the material is given.

3.3 A Critique of the Noticing Hypothesis

Schmidt argues that noticing and/or a higher level of awareness than noticing (see Figure 3.1) are facilitative for L2 learning. It should be made clear that he has not claimed that noticing is necessary and sufficient for L2 learning.

Since it was proposed, the Noticing Hypothesis has attracted SLA researchers' attention and received both support and objections. This section is primarily concerned with theoretical objections to the hypothesis. The objections can be divided into three broad groups.

The first objection is concerned with the role of awareness in L2 learning. The basic claim is that attention without subjective awareness can lead to learning. That is, unconscious learning is possible. In the present study, unconscious learning is equated with learning without subjective awareness. It should be

emphasized here that it is different from learning without intention and learning without explicit metalinguistic knowledge. As people can learn things without intending to, learning without intention is possible. Learning without metalinguistic knowledge is also possible since it is clear that nobody has complete metalinguistic knowledge on the TL. Whether learning without subjective awareness is possible or not is an issue of interest.

Concerning this issue, Tomlin and Villa (1994) have argued that detected information can be registered in memory and that detection is enough for L2 learning. While noticing is a conscious experience, detection occurs at a subliminal level. Detected stimuli include noticed stimuli. As Robinson (2003) has pointed out, the experiments by Marcel (1983) appear to show that detected, but not noticed, stimuli are kept in memory. As Schmidt (1995) has acutely pointed out, however, detection is not enough to bring about learning of new knowledge. As the experiments by Marcel (1983) employed lexical items which the participants already knew, the findings cannot be used as evidence suggesting that detection, which does not accompany subjective awareness, contributes to learning of new linguistic knowledge.

Although people sometimes pick up subliminal signals they already know, there is no evidence as yet that new information can be picked up in such a manner. It should be concluded that subliminal language learning is extremely unlikely. "In consciousness research, it is commonly accepted that some level of attention is required to be able to notice something, and that noticing is crucial in obtaining new information or uptake" (de Bot, Lowie & Verspoor, 2005, p.8).

The present study assumes that while detection brings about the activation of existing knowledge, it does not lead L2 learners to gain new knowledge on the TL. Consciousness at the level of noticing enables L2 learners to learn new knowledge on the TL.

The second objection to the hypothesis is concerned with a methodological issue. It should be admitted that it is difficult to measure consciousness precisely. Although Schmidt (1990) has operationally defined noticing as the availability for verbal report, this operationalization is not subtle enough to measure noticing objectively. As awareness is usually momentary, the method to require learners to

verbalize the contents of awareness cannot grasp what they have noticed completely. What learners can report can be susceptible to various factors such as individual differences and salience of linguistic forms. Some learners are better at verbalizing the contents of awareness than others and some noticed linguistic forms are easier to put into words than others (Jourdenais, 2001; Schmidt, 2001). Although it is evident that methodological improvements are required to evaluate noticing precisely, making use of learners' verbal report as evidence of noticing is the best way available as now.

The third objection to the hypothesis is quite harsh. Truscott (1998), for example, has stated that "The foundations of the Noticing Hypothesis are weak. Cognitive research does not support the claim that conscious awareness of the information is necessary or helpful" (p.110). Carroll (1999) has basically agreed with Truscott (1998) in that the Noticing Hypothesis lacks a property theory. To quote Gregg (2001), "A property theory deals with the instantiation within a given system of various properties of that system" (p.156). According to Cummings (1983, p.15), it is intended to answer "In virtue of what does system S have property Y?" Both Truscott and Carroll consider that the Noticing Hypothesis has not explained how L2 knowledge is instantiated in L2 learners' mind.

Although their claim may be true, it is not a valid objection to the Noticing Hypothesis. The hypothesis is not intended to explain that from the beginning. It simply claims that paying selective attention, or noticing, facilitates L2 learning and that unattended learning is limited in scope and relevance for SLA. Schmidt (2001) describes what must be noticed as "elements of the surface structure of utterances in the input – instances of language, rather than any abstract rules or principles of which such instances may be exemplars" (p.5). If learners notice linguistic forms in input, the noticed forms are likely to receive further processing for comprehension and as a result, desirable IL development can be expected.

It is necessary to note here that Truscott agrees that noticing is necessary for the acquisition of metalinguistic knowledge, which represents the ability to talk about language. Although the Input Hypothesis (see 2.1 for further detail) asserts that it only serves as a monitor, the present study assumes

that it is necessary for L2 learning because it helps L2 learners reflect on how a lexical item should be used in a sentence. It is also true that metalinguistic knowledge can be used to make output correct and more comprehensible.

Although opinions vary as to how metalinguistic knowledge contributes to L2 learning, it is generally agreed that: (1) Metalinguistic knowledge helps learners pay selective attention to linguistic forms in input, (2) Metalinguistic knowledge helps learners establish clear relationship between form, meaning and function, (3) Metalinguistic knowledge has the potential of accelerating the development of IL system and (4) Metalinguistic knowledge makes learners more sensitive to their grammatical mistakes (Douhy & Williams, 1998; R. Ellis, 1997; Norris & Ortega, 2000; Terrel, 1991).

Although it still leaves a lot to be elucidated whether noticing actually promotes IL development, it is generally accepted that noticing linguistic forms such as phonology, grammar, vocabulary and discourse structuring is necessary to bring about other cognitive processes such as comprehension and integration (Doughty, 2001; R. Ellis, 1997; Gass, 1997; Skehan, 1998). Noticing is the first stage in SLA processing stages (Gass, 1988; Skehan, 2002) and the claim made by the Noticing Hypothesis has been empirically supported.

3.4 The Direct Contrast Hypothesis

Although it deals with child language acquisition, Saxton's (1997) Direct Contrast Hypothesis is worth a mention here because it emphasizes the importance of noticing the gap in language learning. The hypothesis has been defined as follows:

When the child produces an utterance containing an erroneous form, which is responded to immediately with an utterance containing the correct adult alternative to the erroneous form (i.e. when negative evidence is supplied), then the child may perceive the adult form as being in CONTRAST with the equivalent child form. Cognizance of a relevant contrast can

then form the basis for perceiving the adult form as a correct alternative to the child form (Saxton, 1997, p.155).

The following example (Saxton, 1997, p.155) illustrates how an adult's correct model leads a child to reproduce it:

(1) Child: Well, I feeled it.

Adult: I felt it.

Child: I felt it.

In the above example, the context of utterance is shared jointly by both the child and the adult and they are both referring to the same event.

The Direct Contrast Hypothesis suggests that the immediate juxtaposition of child and adult forms can provide the impetus for the child to compare the two forms. The immediate juxtaposition of child and adult forms in the above discourse guides the child to determine which of the two linguistic forms should be retained. This unique discourse structure is considered to fulfill a corrective function for the child.

This can be regarded as a theoretical underpinning for the output-input activity in which learners are provided with relevant input after output. The activity can create an immediate contrast between learners' own production and its counterpart in the input. If learners perceive a functional equivalence between the two forms, they are likely to make "relevant comparisons" (Saxton, 1997, p.157) between them. If learners perceive the less appropriate status of their own production, they can replace their currently held linguistic form with its counterpart in the relevant input. Saxton's Direct Contrast Hypothesis has been shown to be right to the point by researchers who have been trying to clarify influences of recasts on L2 learning. Recasts follow learners' ill-formed linguistic realization and reformulate it. They are thought to be one way in which learners notice that their linguistic realization is not correct. Quite a few researchers

agree that recasts cause a cognitive comparison and are an effective pedagogical technique (Doughty & Varela, 1998; Han, 2002; Long, Inagaki & Ortega, 1998).

3.5 Focus on Form

3.5.1 Background

There has been a lively debate as to whether the processes which drive forward an IL system are implicit or explicit. In the former case, learners would process linguistic data, and without their conscious effort, IL change would occur. In the latter, it is assumed that the involvement of learners and their focused attention would facilitate speed and perhaps nature of learning. Although both implicit learning and explicit learning surely exist, the present study assumes that the latter is an issue of greater importance for adult L2 learners.

Several researchers (Doughty & Williams, 1998; Long, 1991; Sharwood-Smith, 1991, 1993) have suggested pedagogies which require L2 learners to pay attention to form during meaning-based activities. The results of those attempts have been successful in encouraging learners to achieve high levels of grammatical accuracy. To discuss various kinds of focus-on-form activities in detail lies outside the scope of the present study. Let us look at the features of focus on form briefly in the next part.

3.5.2 Focus on Form, Focus on Forms and Focus on Meaning

Long (1988, 1991) has distinguished between focus on forms and focus on form. While individual language elements such as verb endings and agreement features are taught directly in the former, the latter is defined as a brief allocation of attention to a linguistic form as the need for this arises incidentally during meaning-based activities (Muranoi, 2006). As Doughty and Williams (1998) have stated, "...focus on form entails a prerequisite engagement in meaning before attention to linguistic features can be expected to be effective" (p.3). Swain (1998) has pointed out that it is insufficient to teach grammatical forms out of context. In focus-on-forms classes, grammatical forms are considered to be paradigms to be rehearsed and

memorized. It seems that direct instruction in grammar does not take SLA processing stages into consideration.

Gass (1988) has proposed five stages whereby learners convert input into output: Apperceived input, comprehended input, intake, integration and output (see Figure 1.1). Similarly, Skehan (2002) has proposed four SLA processing stages: Noticing, patterning, controlling and lexicalizing. They both consider that TL knowledge is not acquired as one. Different parts of linguistic knowledge are at a different point on the sequence. While some linguistic forms may have already reached the lexicalizing stage, other linguistic forms may not have been noticed yet. Learners gradually deepen their TL knowledge by analyzing noticed input, making generalizations, achieving extensions and gaining control of form. As a result, their IL system is restructured gradually. Teaching grammatical rules directly out of context has not been successful because it tries to offer TL knowledge as one without taking the processing stages into consideration. It is necessary to note that learners' interaction with language data changes at different stages of development. It is important to take where learners are in their L2 learning process into consideration.

Another possible reason why direct instruction in grammar is not effective is that it does not promote form-meaning-function mapping which is considered to be necessary for L2 learning. Teaching grammatical rules directly out of context does not provide learners with opportunities to understand the relationship between form, meaning and function. Pedagogical Grammar Hypothesis (Corder, 1973) regards grammatical rules not as objects of learning to be memorized but as what aids learners in developing grammatical competence. Being exposed to explicit grammatical knowledge is not enough for learners to develop grammatical competence (Rutherford & Sharwood-Smith, 1988).

Focus on meaning emphasizes the interaction of meaning and does not take formal elements seriously. Classes where learners are primarily concerned with getting their meaning across do not provide all that is needed for the development of targetlike proficiency (Swain, 1985). In those classes, learners are likely to "become fluent without becoming equally accurate" (Byrd, 2005, p.553). Research in French

immersion classes reveals that even advanced learners often get their meaning across with non-targetlike expressions (B. Harley, 1992; B. Harley & Swain, 1984).

Research in French immersion classes suggests that it is unlikely that learners attend to less salient formal elements even when they have attentional resources to spare. It is probable that they may never attend to purely formal, functionally redundant forms unless some form of instructional intervention forces them to do so (Long & Robinson, 1998).

Compared with focus on forms and focus on meaning, focus on form, in which learners are encouraged to attend to form during meaning-based activities, has the potential to help learners develop both grammatical accuracy and the ability to use the TL.

Hulstijn (2001, 2003) has claimed that learners acquire vocabulary and grammar when they process each linguistic form deeply. That is, when learners are deeply involved with linguistic forms, the forms are likely to be incorporated into their IL system. Quality of information processing plays an important role in L2 learning. Focus-on-form activities, in which learners attend to form according to their needs during meaning-based activities, are considered to encourage learners to process linguistic forms deeply.

3.5.3 Four Features of Focus on Form

Focus on form has been started to reexamine ways in which grammatical accuracy is achieved within communicative language teaching framework. Long and Robinson (1998) have stated that "...during an otherwise meaning-focused classroom lesson, focus on form often consists of an occasional shift of attention to linguistic code features – by the teacher and/or one or more students – triggered by perceived problems with comprehension or production" (p.23). This definition suggests that focus on form includes the following four features:

- (1) An overall emphasis is put on the interaction of meaning.
- (2) Learners occasionally shift their attention from meaning to form.

(3) Language is treated as an object rather than as a tool for communication.

(4) Perceiving problems trigger learners to shift their attention from meaning to form.

Focus on form is assumed to bring about desirable IL development because it provides learners with opportunities where they process form, meaning and function simultaneously (Doughty, 2001). As discussed above, focus-on-form activities engage learners in deeper processing of linguistic forms.

3.5.4 Effects of Focus on Form on L2 Learning

Norris and Ortega's (2000) meta-analysis of various L2 instructional types is informative. They have chosen 49 studies from the published applied SLA literature and attempted to determine which type of instruction results in better learning. They have operationalized the constructs of L2 instruction and proposed five instructional types: Explicit, implicit, focus on meaning, focus on form and focus on forms.

They have compared the 49 studies and clarified relative effectiveness of implicit and explicit types of instruction and relative effectiveness of attention to meaning, form-meaning connections or forms. The results are as follows: Explicit focus on form > Explicit focus on forms > Implicit focus on form > Implicit focus on forms. DeKeyser (1994) has also concluded that explicit learning is more effective than implicit learning.

Muranoi (2000a) tried to clarify the effect of interaction enhancement on the improvement of learners' article use. In his study, in response to targetlike use, the instructor repeated learners' output, which helped learners confirm their hypothesis. In response to non-targetlike output, the instructor requested repetition, and if necessary, recast learners' output. Through this technique, the learners increased accuracy in article use. Similar results can be found in other studies (Nobuyoshi & Ellis, 1993; Takashima & Ellis, 1999).

Psychologists generally agree that new knowledge that is processed more elaborately is more likely to be retained than that which is processed less elaborately (R. Ellis, 1999; Hulstijn, 2001). It is generally

agreed that focus-on-form activities provide learners with opportunities to process input more elaborately and to establish a stronger form-meaning-function relationship.

The studies which attempted to clarify the impact of focus-on-form activities on L2 learning have brought about the following results (Doughty & Williams, 1998; Williams, 2005):

- (1) Focus-on-form instruction which helps learners understand form-meaning-function relationship promotes L2 learning under certain circumstances. It especially encourages learners to notice less salient linguistic forms in input.
- (2) Explicit grammar instruction is effective when it is implemented during focus-on-form instruction.
- (3) Focus-on-form instruction which involves negotiation of meaning promotes L2 learning when learners' psycholinguistic readiness matches the instruction.
- (4) Focus-on-form instruction which requires learners' output encourages learners to notice a hole and to notice the gap between IL and TL form.

Focus-on-form instruction promotes L2 learning because it promotes cognitive processes which have important roles in L2 learning. The instruction channels attention and brings into awareness what otherwise would have been missed. For example, noticing, form-meaning-function mapping, hypothesis testing and automatization of currently held linguistic knowledge are promoted through focus-on-form activities.

3.6 Noticing in English Language Education

Various L2 learning models have been proposed (for example, N. Ellis, 2001; R. Ellis, 1997; Gass, 1997; Johnson, 1996; VanPatten, 1996). They all assume that learners' interaction with input data changes at different stages of development. At which stage learners are in the L2 learning process determines how they interact with language data. The process begins with input. All the models agree that input is

necessary for the process to begin. The availability of input, however, is not sufficient for L2 learning. It is necessary for learners to take in data in the input and process it. In order for this to happen, learners must attend to input.

Although some studies indicate the possibility of some unattended learning, this appears limited in scope and relevance for L2 learning. The present study assumes that attended learning, or learning with awareness, is far superior and that attention is necessary for all aspects of L2 learning. L2 learning is mainly driven by what learners pay attention to in TL input. The centrality of attention in L2 learning cannot be denied. It should be concluded that learning is largely a side effect of attended processing. As Logan, Taylor and Etherton (1996) have acutely pointed out, people learn about the things they attend to and do not learn much about the things they do not attend to.

Whether there is learning without noticing or not seems to be an inconclusive debate. To inquire further into the matter will not be productive. There have been no studies which support the marginality of noticing in L2 learning. Although detection brings about automatic and unaware activation of existing knowledge, it does not encourage learners to learn new L2 knowledge.

Subliminal perception studies have shown evidence for the cognitive registration of stimuli without subjective awareness (Schmidt, 1990, 1993, 1994, 1995). They have shown that unattended information is registered in implicit memory. What should be emphasized here is that new information is not gained in that way. That is, people cannot take in new knowledge unless it is registered consciously. What these studies show is that previously well-learned information which is present in long-term memory can be cognitively activated without subjective awareness. The vast majority of these studies, however, do not show that new knowledge is taken in without conscious registration. Although people sometimes pick up subliminal signals they already know, there is no evidence as yet that new information can be picked up in such a manner. It should be concluded that subliminal language learning is extremely unlikely.

The results of experimental laboratory studies of SLA which have attempted to clarify the effects of

different conditions of exposure to input on L2 learning suggest that noticing is necessary for L2 learning (see de Graaff, 1997; N. Ellis, 1993; Hulstijn, 1997; Williams, 1999 for overviews). Attention to input, awareness and intention to learn have been employed as independent variables in the studies. The results are: (1) Attention to input is necessary for SLA, (2) Awareness is facilitative and likely necessary too (though difficult to assess) and (3) Intention to learn – while necessary in many aspects of vocabulary acquisition – is not necessary for grammar acquisition. These results can be interpreted to support the centrality of noticing in L2 learning.

Snow (1987, 1994) regards noticing the gap as one of the important abilities which jointly influence L2 learning, with which the present study agrees. As stated in 3.4, children can reproduce a correct form offered by adults in naturalistic environments during oral interaction.

It should be noted that adult L2 learners cannot be expected to notice the gap successfully in naturalistic environments. Salthouse (1996) has proposed that declines in processing speed across the lifespan can explain why adult L2 learners cannot learn a language as successfully as children in naturalistic environments. Processing speed is considered to contribute to the ability to notice the gap. For focus-on-form activities to facilitate such noticing for adult L2 learners, more explicit techniques should be adopted. As learners do not attend to less salient or less meaningful linguistic forms when they are engaged in meaning-based activities, a deliberate technique is required to draw learners' attention to them.

It is reasonable to conclude that leading L2 learners to pay deliberate attention to less salient or redundant aspects of L2 input is a practical necessity to bring about desirable IL development. One cannot deny the centrality of noticing and the marginality of implicit learning in L2 learning. Noticing contributes to L2 learning by provoking other important cognitive processes which are likely to promote IL development.

Chapter 4

Theoretical Support for the Output-Input Activity and Research Questions

The ultimate goal of English language education research is to gain a better understanding of what knowledge is acquired through certain activities and the mechanisms which bring that knowledge about. In other words, what second language acquisition (SLA) researchers have to do is to investigate how teachers' intervention into learners' thoughts and behaviors promotes learning processes for intended outcomes. The discussion in Chapters 2 and 3 suggests that both output and noticing play important roles in facilitating desirable development of second language (L2) learners' interlanguage (IL) system. Noticing triggered by output seems to be different from noticing involved in comprehension and the former is likely to bring about more learning than the latter (see 2.6.4 for further details). Exposure to relevant input immediately after output has the potential of developing L2 learners' IL system effectively. This procedure will be called the output-input activity. The output-input activity seems to lead L2 learners to notice a mismatch between their IL form and the target language (TL) model.

As VanPatten (1990) has pointed out, learners basically use their limited processing resources to attend to meaning under information processing pressure. Learners only attend to form in input if they have spare processing capacity available. It means that instructional practices that focus learners' attention on form deliberately have a solid justification. The output-input activity is assumed to guide learners to get engaged in cognitive processes necessary for desirable IL development. It seems that learners' IL system is most likely to change when they are grappling with a specific means of expression to convey their intended meaning.

This chapter will first show a hypothetical way in which producing output and noticing triggered by producing output contribute to the incorporation of linguistic forms. Then it will offer theoretical support for the output-input activity. Finally, it will offer six research questions the present study tries to answer.

Then six hypotheses to be tested will be formulated.

4.1 A Hypothetical Way in Which Output and Noticing Contribute to IL Development

Figure 4.1 illustrates how the output-input activity leads L2 learners to incorporate linguistic forms into their IL system. Learners' current knowledge on the TL is assumed to play an important role in the activity. It is shown as "CKTL" in the figure.

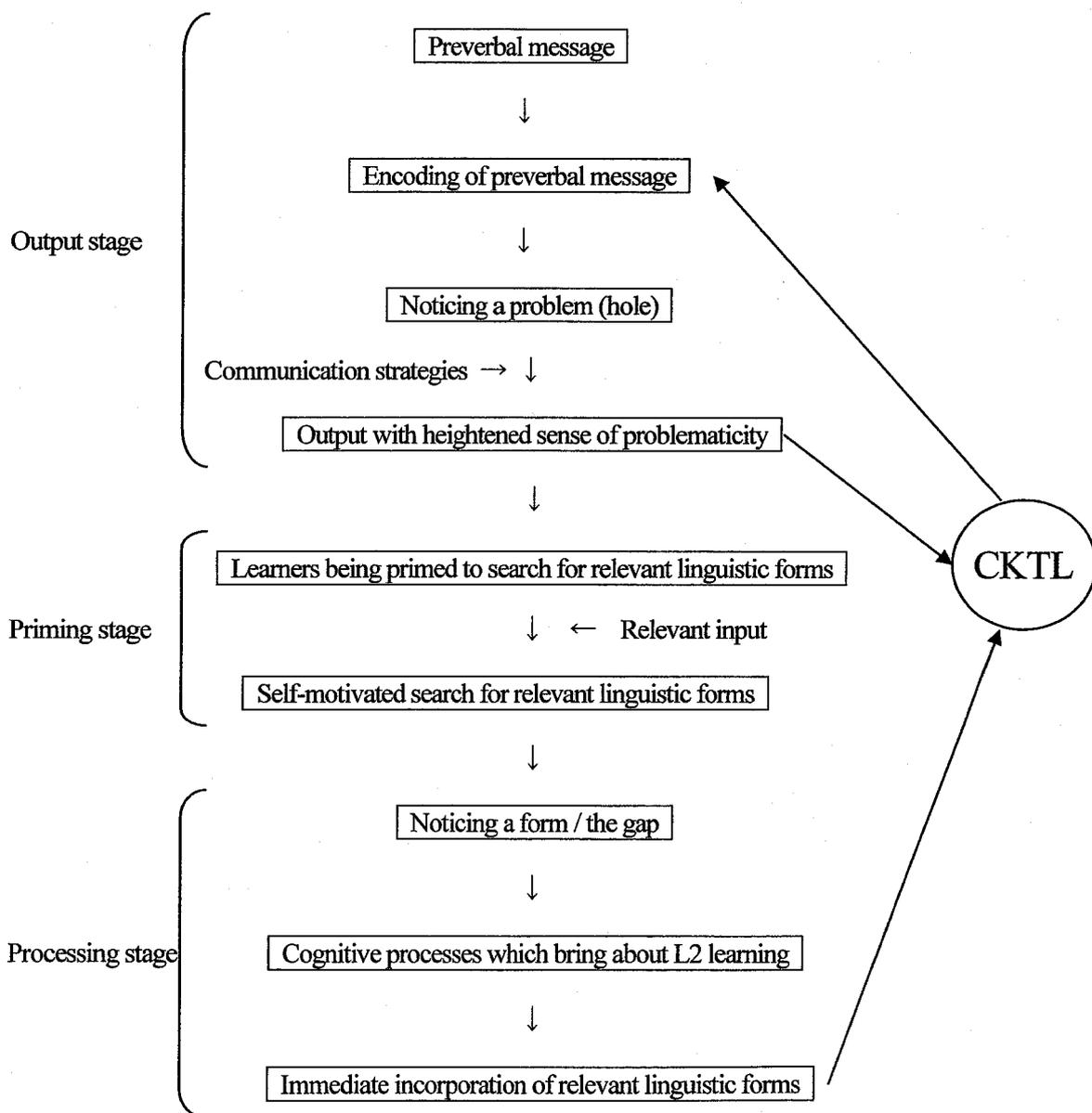


Figure 4.1 A hypothetical way in which output and noticing contribute to IL development

The hypothetical way consists of three stages: Output stage, Priming stage and Processing stage. Although the first two stages are closely related to each other and cannot be separated completely, each stage will be discussed separately for the sake of convenience.

“Preverbal message” in the figure refers to learners’ intended meaning. In realizing the preverbal message linguistically, they make access to their currently held linguistic knowledge. As discussed in 2.4.2.1, output prompts learners to notice that their current IL system does not have the exact linguistic repertoire to match their intended meaning. If the linguistic form in question is not available in their IL system, they have to be satisfied with a less precise alternative, or “Learners’ output with heightened sense of problematicity” in the figure.

Having a problem during output and solving it with communication strategies prime learners to search for relevant linguistic forms. If the relevant input is offered in a timely manner, they voluntarily channel their attentional resources toward the relevant linguistic forms in the input.

They may notice a new linguistic form in the relevant input and/or notice that their linguistic realization is different from its counterpart in the relevant input. Noticing a form/the gap encourages learners to be engaged in the cognitive processes which bring about L2 learning. Typical examples are: A cognitive comparison, noticing an IL-TL mismatch and a syntactic analysis. Exposure to relevant input in a timely manner also provides learners with opportunities to test their hypotheses. Hypothesis testing based on positive evidence also plays crucial roles in L2 learning (Bley-Vroman, 1986; Cook, 1985; Schachter, 1993). Noticed linguistic forms are processed by learners with their current linguistic knowledge. If the processing is deep enough, they incorporate the noticed linguistic forms into their IL system. As a result, their knowledge on the TL will be increased. This is how the output-input activity contributes to IL development.

4.2 Theoretical Support for the Output-Input Activity

The output-input activity is likely to bring about desirable IL development. It is necessary to explain why

the activity contributes to IL development. It seems that there are four factors which explain why the activity brings about desirable IL development. They are: Syntactic processing evoked by output, attention to be focused on form, a cognitive comparison and a preference for recent speech.

4.2.1 Syntactic Processing Evoked by Output

Earlier proposals that it is simply comprehensible input which would suffice for L2 learning have been abandoned and most L2 teachers agree that learners' output is necessary for desirable IL development. Swain (1985) has suggested that one plausible reason that L2 learners in immersion contexts do not develop the ability to produce grammatically accurate utterances even after being exposed to years of ideal comprehensible input is that they are not given enough opportunities to produce the TL, asserting that "producing the target language may be the trigger that forces the learner to pay attention to the means of expression needed in order to successfully convey his or her own intent" (p.249). Swain (2000) has further suggested that "Output may stimulate learners to move from the semantic, open-ended, strategic processing prevalent in comprehension to the complete grammatical processing needed for accurate production" (p.99).

During comprehension, learners can rely on three types of information: Linguistic input, contextual information and their linguistic and other general knowledge of the world, including semantic and pragmatic knowledge. In comprehension, people make use of various resources available to them, using both top-down and bottom-up approaches, to arrive at comprehension of the input messages. That is, they do not have to depend solely on syntactic information for comprehension. It even happens that syntactic information is circumvented in comprehension processes as Clark and Clark (1977) have acutely pointed out:

Listeners know a lot about what a speaker is going to say. They can make shrewd guesses from what has been said and from the situation being described. They can also be confident that the

speaker will make sense, be relevant, provide given and new information appropriately, and in general be cooperative. Listeners almost certainly use this sort of information to select among alternative parses of a sentence, to anticipate words and phrases, and even to circumvent syntactic analyses altogether (p.72).

During output processes, however, learners cannot circumvent syntactic analyses because they can not resort to various external resources available to them during comprehension. The most important difference between production and comprehension is that learners cannot rely on external cues and general world knowledge during the former. Producing output generally requires more effort than comprehension and requires learners to attend to the details of linguistic forms. Thus learners need greater syntactic processing in production.

Although input enhancement is an effective way to trigger learners' noticing, noticing triggered by input enhancement is less likely to result in learning compared with noticing triggered by output (Izumi, 2002). This is primarily because output is an internal attention-focusing device and requires learners to think about the detailed linguistic forms or the syntactic features of language. Although thinking about language during output processes may hinder a natural flow of communication and seem to be inefficient for L2 learning, this opportunity actually plays a crucial role in bringing about desirable IL development. Thinking about language rarely happens during comprehension because meaning-processing predominates when learners try to understand input. Producing output thus has a potential of moving learners from a semantic processing mode to a syntactic processing mode where they have to pay close attention to every aspect of language. While linguistic information is one of several sources and can be compensated by other sources in comprehension, producing output has to depend on linguistic information as only one source. That is, learners cannot make use of external cues and general world knowledge in production in the same way as they do in comprehension and thus they need greater syntactic processing in production. During output, L2 learners do not exclusively try to communicate

meanings but also are concerned with the underlying linguistic forms which they are using.

4.2.2 Attention to Be Focused on Form

Chapter 3 discussed the importance of noticing, or paying selective attention to a certain part in input. For learners to learn new linguistic forms, it is necessary for them to pay selective attention to the forms. Questions now arise. What linguistic forms are learners more likely to notice? Do learners have enough cognitive resources to notice less salient forms? It is the case, however, that learners' attention tends to be drawn to certain parts of input, particularly those that are immediately relevant to message content (VanPatten & Sanz, 1995). If they do not receive any instruction at all, learners are likely to pay their selective attention to content words for message understanding. VanPatten (1996) has observed that there is an order of priority when learners' attentional resources are used to map a form with its appropriate meaning. His basic idea is: Content words are first processed, then grammatical forms with high communicative value and finally grammatical forms with less communicative value are processed. He defined communicative value as "the relative contribution a form makes to the referential meaning of an utterance...based on the presence or absence of two features: inherent semantic value and redundancy within the semantic utterance" (p.24). Linguistic forms that have inherent semantic value and are not redundant have high communicative value, whereas linguistic forms that lack (or are light in) inherent semantic value and are redundant basically have low communicative value. A typical example of the former is a progressive morphology, *-ing*, in English, and the latter, a third person present singular morphology, *-s*, in English.

If no instruction is offered at all, learners are less likely to search input for grammatical forms with less communicative value. How can L2 learners' attention be efficiently directed to forms in the input which they may fail to perceive when left to their own? Sharwood-Smith (1995) has pointed out that input salience can be internally derived (when input becomes noticeable to the learner because of internal cognitive changes and processes) or externally derived (when input becomes more noticeable because the

manner of exposure is changed). Explicit instruction, for example, helps learners focus their attention on forms and meanings in input, which brings about subsequent processing necessary for intake.

As Cumming (1990) has pointed out, desirable IL development is likely to be brought about when learners pay attention to both a linguistic form and its meaning simultaneously. It seems to be quite difficult for many Japanese learners of English to do so in a real time communicative context. VanPatten (1990) has carried out experiments showing that learners have great difficulty attending to both form and content simultaneously, although they need to do so in order to establish a form-meaning relationship.

It is also true that many features of language could not possibly be attended to because they are likely to be non-salient, abstract, infrequent and communicatively redundant. Intentionally focused attention is a practical necessity for successful language learning. Since task demands are an important determinant of attentional focus, instructional practices that focus learners' attention on things that they are less likely to attend to have a firm justification. As illustrated in Figure 4.1, the output-input activity is assumed to be an effective attention-focusing device.

To promote desirable IL development, learners' attention needs to be drawn to crucial linguistic features. Output is considered to achieve this by triggering them to notice problems in their IL. If relevant input is presented immediately after output, learners are likely to pay closer attention to linguistic forms which their IL system lacks and to process them in detail. This brings about the integration of attention to form and meaning.

As discussed in 3.5, paying attention to form during meaning-based activities contributes to IL development. The output-input activity is likely to lead learners to process input with greater attention because noticing a hole triggered by output makes them more sensitive to linguistic forms to convey their intended meaning.

4.2.3 A Cognitive Comparison

The output-input activity provides L2 learners with an opportunity to compare their own linguistic

realization with its counterpart in input. They may notice that their linguistic realization is different from its counterpart in input. Noticing the mismatch between their current IL system and the TL system encourages learners to compare their IL and the TL. This is called a cognitive comparison and it is expected to play an important role in IL development. This cognitive comparison is assumed to lead learners to replace their currently held linguistic form with a more targetlike form if they realize the less appropriate status of the former.

Nelson (1987) assumes that cognitive comparisons between a current structure and a new structure are crucial for children to advance their language system. When cognitive comparisons occur between a current structure and a new structure, three outcomes are possible: (1) There is no discrepancy between the structures, and children interpret this as confirmation of the usefulness of the current structure, (2) A discrepancy exists, but children cannot encode the discrepancy or (3) A discrepancy exists, and children can encode the discrepancy. Only the third case makes successive advances in language acquisition.

Although Nelson (1987) was concerned with the mechanisms of children that led to the progress in language acquisition and with the conditions which contributed to children making successive advances in language acquisition, a number of researchers have agreed that cognitive comparisons play crucial roles in adult L2 learning, too (R. Ellis, 1997; Gass, 2003; Muranoi, 2000a; Tomasello & Herron, 1989).

For learners to notice the mismatch between their own linguistic realization and its counterpart in relevant input provided immediately after output, they have to realize that the two expressions are referring to the same event and are fulfilling the same function. This suggests that the resemblance between the two expressions can be an important determinant for a cognitive comparison to occur.

Concerning this issue, Boulouffe (1986) has claimed that the gap between a learner's output and its target form has to be sufficiently narrow for the mismatch to be perceptible. Takatsuka (2003) has analyzed the influence of the procedure where learners realize problems in production and notice forms in model sentences on the learning of linguistic forms. The result of the analysis shows that the resemblance between learners' output and its target expression has a potential influence on L2 learning. If learners'

linguistic realization does not have a resemblance to its target expression, it is likely that they do not incorporate the target expression into their IL system. For learners to notice that their own linguistic realization and its target expression are referring to the same event and are exchangeable, the resemblance between the two expressions is a prerequisite. This implies that all output activities do not necessarily lead learners to engage in a cognitive comparison. To maximize the output effects on L2 learning, care should be taken in choosing an output task.

4.2.4 A Preference for Recent Speech

A preference for recent speech is called syntactic priming, which is defined as “the tendency for a speaker to produce a syntactic structure that occurred in the recent discourse rather than an alternative structure” (Kim & McDonough, 2008, p.149).

Studies of conversational analysis (Schenkein, 1980), child-directed discourse (Doughty, 1994) and speech errors by L1 adult speakers (T. Harley, 1984) all show that there is evidence for a cognitive preference for re-utilizing recent speech. Schenkein (1980) has claimed that “the systematic use of resources from prior talk in current talk apparently organizes the conversation” (p.46). According to Schenkein’s analysis, structural and thematic resources that occur in the prior turn are likely to be used to organize the following conversation. This occurs both in an interlocutor’s utterance and within the same speaker’s utterance and sometimes occurs even minutes later.

Doughty (1994), based on empirical evidence, has concluded that child-adult discourse, like adult-adult discourse, is organized by a cognitive preference for using repeating resources from recent speech. T. Harley (1984), analyzing speech errors by adult L1 speakers, has demonstrated that resources in recent conversation influence the subsequent utterances and claimed that “speakers must hold fairly concrete representations of prior discourse throughout conversation which either can be incorporated into or used to influence the form of new productions” (p.199). What the three researchers have pointed out is known as the cognitive process of “perseveration” (Doughty, 2001, p.232).

Concerning the preference for re-utilizing recent speech, Levelt and Kelter (1982) state as follows:

“It is as if previous talk sets up a more or less abstract frame in the mind of an interlocutor, which is then used in the formulation of the next turn” (p.79). When one realizes his or her intended meaning linguistically, it is assumed, the format used for encoding the meaning is kept active in memory. The format that is present in memory can be activated and affects the following encoding processes. This heightened level of activation seems to explain why the output-input activity is likely to bring about desirable IL development.

As mentioned in 4.2.1, producing output moves learners to a more syntactic mode than comprehension. After learners have encoded an intended message, the structural format used for encoding the message remains active in memory. If a proper stimulus is presented in a timely manner, the format is further activated and leaves a deeper trace in memory. For a provided stimulus to activate the format, it is necessary that the stimulus contains a format which is similar to the structural format which remains in memory. If this condition is fulfilled, L2 learners are ready to incorporate new linguistic forms into their IL system.

The importance of the resemblance between learners’ output and the target form provided after producing output should be stressed here again. For the form provided after producing output to further activate the format which remains active in memory, the two expressions should have a resemblance. If the form provided after producing output does not have a resemblance to learners’ output, the structural format which remains active in memory does not get stimulated. As a result, the structural format stored in memory is lost and does not make any contribution to IL development.

4.3 Research Questions

The previous section offered theoretical underpinnings for the output-input activity and suggested four theoretical factors which seem to explain why the activity contributes to desirable IL development. Although they were treated independently for the sake of convenience, it is necessary to note that they are

interwoven with each other and that they make a composite contribution toward desirable IL development.

Both output and noticing triggered by output have important roles in L2 learning. The output-input activity is considered to help learners develop their IL system in its own way. The primary interest of the present study lies in clarifying how output and noticing triggered by output contribute to the IL development. The following six research questions will guide the investigation of the present study.

- (1) What aspects of language are likely to be incorporated through the output-input activity?
- (2) Do noticing a hole triggered by output and noticing a relevant form in input presented immediately after output encourage learners to incorporate linguistic forms into their IL system?
- (3) How do learners' proficiency levels influence their noticing forms?
- (4) How do learners' proficiency levels influence the incorporation of linguistic forms?
- (5) Do learners incorporate more linguistic forms into their IL system if their own linguistic realization bears a resemblance to its counterpart in relevant input presented immediately after output?
- (6) What cognitive activities evoked by output and noticing encourage learners to incorporate linguistic forms?

Question 1 is concerned with how the output-input activity contributes to L2 learning. It is agreed that output contributes to better access to linguistic knowledge. That is, fluency in the TL is fostered by output. Opinions vary as to whether output brings about the growth of learners' IL system. What needs to be clarified is whether the output-input activity brings about the establishment of new representations. The present study assumes that output brings about the learning of new knowledge and tries to clarify what aspects of language L2 learners incorporate through the output-input activity.

Question 2 is concerned with how noticing a hole and noticing a form encourage learners to incorporate linguistic forms into their IL system. The discussion in Chapters 2 and 3 predicts that the

noticed forms are more likely to be incorporated into learners' IL system. Although the possibility of learning without awareness cannot be denied completely, both noticing a hole and noticing a form facilitate further processing of the noticed forms and consequently, learners are likely to incorporate them into their IL system.

Questions 3 and 4 are both concerned with learners' proficiency level. Question 3 is concerned with the relationship between learners' proficiency level and their noticing. Since beginning learners are cognitively overloaded, they cannot allocate their attentional resources as efficiently as advanced learners. As they gain a better command of the TL, they have more capacity to attend to the details of linguistic forms.

Question 4 is concerned with how learners' proficiency level influences the incorporation of linguistic forms into their IL system. After noticing a form occurs, the noticed form goes through processing by learners. As discussed in 3.1.3, L2 learners depend on their currently held linguistic knowledge to process the noticed form. The more knowledge a learner has, the more elaborate the learner's processing is. It is reasonable to predict that learners with ample knowledge on the TL are likely to incorporate more linguistic forms into their IL system.

Questions 5 and 6 both deal with processing triggered by noticing a form. Question 5 is formulated based on the discussion in 4.2.3 and 4.2.4. For a cognitive comparison to occur, learners need to notice that their output and a form in relevant input are different linguistic realizations of the same proposition. As discussed in 4.2.4, the structural format used for producing output is stored in memory. If the form in relevant input matches it, the format is activated again and leaves a deeper trace in memory. It is predicted that the resemblance between the two expressions which refer to the same event facilitates learners' cognitive comparison and thus encourages them to incorporate the form in relevant input into their IL system.

Question 6 is concerned with the roles of cognitive activities to play in IL development. When they are exposed to relevant input after producing output, L2 learners may notice forms in the input and get

involved in various cognitive activities. It is assumed that an analysis at a deeper level leads to more elaborate, longer lasting and stronger traces in memory. The present study tries to describe what cognitive activities learners are involved in when they notice forms and to clarify the relative effects of the cognitive activities on the incorporation of linguistic forms into their IL system.

4.4 Hypotheses

The following hypotheses were formulated based on the above research questions. The discussion in Chapters 2 and 3 also helped formulate the hypotheses.

4.4.1 Hypothesis 1

Hypothesis 1 is based on the first research question. VanPatten (1994) has suggested that aspects of language may be different in their attentional requirements. Vocabulary learning requires attention and awareness in ways that syntax learning does not. As producing output requires learners to think about syntax, knowledge on syntax may be gained through the output-input activity. As producing output provides learners with opportunities to reflect on how a lexical item should be used in a sentence, learners may deepen their understanding as to what other lexical items should be collocated with a lexical item in question.

Hypothesis 1: Learners incorporate grammatical forms, grammatical collocations and lexical collocations through the output-input activity.

4.4.2 Hypothesis 2

Hypothesis 2 is based on the second research question. Noticing a hole in production leads learners to be more attentive to linguistic forms in relevant input provided after producing output, which fosters noticing a form. As discussed in Chapter 3, noticing is considered to facilitate L2 learning. L2 learners do not learn

new information without subjective awareness, or noticing. It can be predicted that both noticing a hole and noticing a form contribute to desirable development of learners' IL system.

Hypothesis 2: Learners incorporate more linguistic forms into their IL system when they notice a hole and/or when they notice a form in input.

4.4.3 Hypothesis 3

Hypothesis 3 is based on the third research question. L2 learners' interaction with input data changes at different stages of development. As discussed earlier, learners with high proficiency have more capacity to process input. As they have better access to linguistic knowledge than learners with low proficiency, it is likely that learners with high proficiency attend to the details of linguistic forms that learners with low proficiency do not.

Hypothesis 3: Learners with high proficiency notice more forms in relevant input than learners with low proficiency.

4.4.4 Hypothesis 4

Hypothesis 4 is based on the fourth research question. What is noticed is interpreted by existing schemata and the amount of existing schemata is reflected in learners' proficiency level. When learners are exposed to relevant input immediately after output, they process linguistic forms in the input with their prior knowledge on the TL. Whether the processing is successful or not is highly dependent on the amount of knowledge an individual learner has on the TL (Anderson, 1995). While learners with low proficiency have difficulty in processing noticed forms because of their limited resources, learners with high proficiency have more resources to process them. As a result, learners with high proficiency are likely to incorporate more linguistic forms.

Hypothesis 4: Learners with high proficiency incorporate more linguistic forms into their IL system than learners with low proficiency through the output-input activity.

4.4.5 Hypothesis 5

Hypothesis 5 derives from the fifth research question. A cognitive comparison is assumed to play an important role in L2 learning (see 4.2.3 for further details). For a cognitive comparison to occur, it is necessary that learners' own linguistic realization has a resemblance to its target form in relevant input provided immediately after producing output. If learners notice that the two expressions are referring to the same event and have the same function, they compare them and notice the difference between them. If they feel that their own linguistic realization is erroneous, they may replace it with its counterpart in the relevant input.

Hypothesis 5: Learners incorporate more linguistic forms into their IL system when their own linguistic realization bears a resemblance to its counterpart in input than when it does not bear a resemblance.

4.4.6 Hypothesis 6

Hypothesis 6 is based on the sixth research question. Craik and Lockhart (1972) have argued "analysis proceeds through a series of sensory stages to levels associated with matching or pattern recognition and finally to semantic-associative stages of stimulus enrichment" (p.675). This suggests that an analysis at a deeper level leads to more elaborate, longer-lasting and stronger traces.

It can be predicted that an analysis at a deeper level leads to the incorporation of more linguistic forms. In relation to this issue, Izumi (2003) has pointed out that an analysis at the level of syntax may be more effective in leading L2 learners to incorporate linguistic forms into their IL system than an analysis at the level of meaning. If the detected parts are analyzed syntactically, the parts are more likely to be

incorporated.

Hypothesis 6: A syntactic analysis of a noticed part results in the incorporation of more linguistic forms.

4.5 Summary

Output primes learners to search for more information, to be more sensitive to future input (for example, use of a lexical item, structure and spelling) or to be more aware of their hypothesis about the TL. If relevant input is available, it can serve to confirm or disconfirm their hypothesis. If the hypothesis is disconfirmed, learners may form another hypothesis and this process repeats until their hypothesis is confirmed. This is how the output-input activity contributes to the desirable development of learners' IL system. The six hypotheses which the present study will test are listed here again:

- (1) Learners incorporate grammatical forms, grammatical collocations and lexical collocations through the output-input activity.
- (2) Learners incorporate more linguistic forms into their IL system when they notice a hole and/or when they notice a form in input.
- (3) Learners with high proficiency notice more forms in relevant input than learners with low proficiency.
- (4) Learners with high proficiency incorporate more linguistic forms into their IL system than learners with low proficiency through the output-input activity.
- (5) Learners incorporate more linguistic forms into their IL system when their own linguistic realization bears a resemblance to its counterpart in input than when it does not bear a resemblance.
- (6) A syntactic analysis of a noticed part results in the incorporation of more linguistic forms.

Chapter 5

The Studies

This chapter will review the three experimental studies which were conducted to clarify the influences of output and noticing triggered by output on the development of interlanguage (IL) system of Japanese learners of English.

As the three studies share the basic experimental sequence, the factors which are common to them will be explained first. Then, the details of each study will be explained. Each study will be explained in the following order: Aim, theoretical background, research questions, methodology, results, discussion and conclusion.

5.1 Common Factors

5.1.1 Variable

Although initial knowledge on target linguistic forms seems to be an important factor in affecting noticing, none of the studies measured the participants' initial knowledge on the target linguistic forms. Measuring the participants' initial knowledge on the target linguistic forms before implementing experimental studies might distort the results of the studies because it offers the participants an opportunity to learn the forms.

Instead of their initial knowledge on the target linguistic forms, their general target language (TL) proficiency was employed as the variable. It is generally agreed that second language (L2) learners' interaction with input changes at different stages of development and that their target language proficiency is one of the most influential learners' variables. Learners' TL proficiency is likely to influence their noticing and the processing subsequent to noticing. Even if the same input is offered, each learner interacts with it in different ways. Measuring the participants' TL proficiency does not offer them an opportunity to learn the target forms before the experiments.

5.1.2 Participants

The participants in the three studies are undergraduate students. Their ages range from 18 to 22 and the period of their receiving formal English language instruction at school ranges from seven years to ten years. Recruiting the participants who share the same first language (L1) and similar educational background makes it possible to minimize the effects of extraneous variables. They all fulfill the following requirements:

- (1) They are not majoring in English language or English literature.
- (2) They have not stayed in an English speaking country for more than a year.
- (3) They started learning English when they entered a junior high school.
- (4) They do not have an opportunity to use English in their daily lives.

It is possible to say that those following the above requirements represent typical Japanese learners of English. This is important in recruiting participants for experimental studies like the present study. It is natural that those who are majoring in English language and/or have stayed in an English speaking country for a long time have a good command of English. It is also likely that they are strongly motivated to study English and that they are quite good at expressing themselves in English. The results of studies whose participants are such advantaged learners of English cannot be made use of to discuss how English language education in Japan can be improved in general. The participants in the three studies seemed to have already learned a substantial amount of TL knowledge. However, they were not accustomed to realizing their intended messages linguistically because they had not been provided with the opportunities to do so at school. Compared with their comprehension ability, their production ability was quite low.

As discussed in 2.7, all learners do not benefit from output equally. Learners with ample TL knowledge which they can potentially draw upon to produce output might benefit more than those who are having difficulty in producing one-word utterances.

5.1.3 Experimental Sequence

Although there are minor differences, the three experimental studies share the same experimental sequence, which is shown in Table 5.1.

Table 5.1

Experimental Sequence

Stage	Activity
1	Test of target language proficiency (pretest)
2	Output 1
3	Exposure to relevant input
4	Report of noticing
5	Output 2 (posttest)
6	Interview

At Stage 1, the participants' TL proficiency was measured. Based on the test results, they were divided into three groups: Upper group, Middle group and Lower group.

At Stage 2, the participants performed an output task. Their linguistic realization at Stage 2 will be called Output 1. Each experimental study employed different output tasks. At Stage 3, the participants were exposed to relevant input. It was presented in a written mode. At Stage 4, the participants took notes of what forms they had noticed in looking at the relevant input.

At Stage 5, the participants performed the same output task as the one they had done at Stage 2. They were asked to perform the same task on the following week without previous notice. Their linguistic realization at Stage 5 will be called Output 2.

After that, the author had an interview with some randomly selected participants to understand what they had actually done and thought. The primary purpose of the interview was to understand what they

thought about when they were exposed to relevant input after output.

5.1.4 Report of Noticing

As discussed in 3.3, it is difficult to judge whether noticing occurred or not precisely. The present study, following Schmidt (1990), operationally defines noticing as the availability for verbal report. Although the method to require the participants to verbalize what they noticed is not subtle enough because awareness is usually momentary, making use of learners' verbal report as evidence of noticing is the possible best way as now. Dennett (1991) considers that making use of learners' verbal reports is an effective data collecting means to understand their mental states.

In the studies, the participants used their L1, or Japanese, to report what forms they had noticed. As Lee (1986) and Wolf (1993) have pointed out, verbalizing what has been noticed in the TL may result in less precise reports because of the difficulty of using the TL. Learners' perceptions of noticing are not always straightforward and it is difficult to evaluate noticing objectively. In operationalizing noticing, language-related episodes (LREs) were consulted in the present study. LREs are defined as any part of a dialogue in which L2 learners talk about the language they are producing (Swain & Lapkin, 1995, 1998).

5.2 Study 1

5.2.1 Aim

Hypotheses 1, 2 and 4 are tested in Study 1. It aims to investigate how noticing a hole during translation from Japanese to English and noticing a form in relevant input provided after completing the translation task encourage Japanese learners of English to incorporate linguistic forms into their IL system.

5.2.2 Theoretical Background

5.2.2.1 Linguistic Features of Target Forms

Takatsuka (2003) has analyzed how noticing a hole during production and noticing a form in relevant

input influence the incorporation of linguistic forms. He proposes a hypothesis that it depends on the features of target linguistic forms whether noticing can become an asset in L2 learning. What do the features of target linguistic forms mean? Learning linguistic forms is a process of mapping forms with their appropriate meanings. To learn linguistic forms, learners have to familiarize themselves with both forms and their meanings.

When they learn new linguistic forms, there can be two possibilities: (1) They have partial knowledge on the target linguistic forms and (2) They do not have any partial knowledge on the target linguistic forms. Learning new lexical items, for example, requires learners to learn both their forms and meanings. When learners are exposed to a new lexical item for the first time, they do not have any partial knowledge on it.

While learning an L2, learners are often exposed to linguistic forms on which they have partial knowledge. Learning collocations, for example, requires learners to think about how a lexical item should be used. In any language, certain lexical items regularly combine with certain other lexical items or grammatical constructions. These recurrent, semi-fixed combinations are called collocations (Benson, Benson, & Ilson, 1997). Grammatical collocations consist of a dominant lexical item such as a noun, a verb and an adjective and a preposition. It often happens that L2 learners are familiar with a dominant word but do not know what preposition should be used with it. Most lexical items have more than one meaning. It is not unusual for L2 learners to notice that a lexical item whose meaning they know is used in a different meaning. Whether learners have partial knowledge on target linguistic forms may influence cognitive processes triggered by noticing.

5.2.2.2 Learners' TL Proficiency, Attention and Noticing

Do all learners direct attentional resources to the same meaningful differences irrespective of their TL proficiency? Attention is viewed as a limited set of mental resources that have to be shared by various processing activities (de Bot, 1996). Learners allocate the resources to what they think is important. As

discussed in Chapter 3, learners with low proficiency cannot draw their attentional resources to all meaningful differences at once because they are cognitively overloaded. On the other hand, learners with high proficiency have more capacity to attend to the details such as prepositions, articles, pragmatics and discourse structuring.

As they acquire a better command of English, learners have easier access to linguistic forms. As a result, some cognitive processes get automatized and attentional capacity is freed.

5.2.3 Research Questions

Based on the above discussion, the following research questions were formulated:

- (1) Do noticing a hole and noticing a form promote the incorporation of linguistic forms?
- (2) Does learners' proficiency in English influence their noticing a hole and noticing a form? As a result, does that influence the incorporation of linguistic forms?
- (3) Do noticing a hole and noticing a form encourage learners to learn new lexical items or deepen their understanding of linguistic forms on which they have partial knowledge?

5.2.4 Methodology

5.2.4.1 Participants

Thirty-nine Japanese learners of English participated in the study. They were undergraduate students whose major was not English. Before the experimental study, they took a pretest to evaluate their proficiency in English. The proficiency test used in the study was a C-test, in which every 11th word had been deleted. C-tests have proven to be a fairly reliable measure of global L2 competence (Kormos, 2000). The C-test given to the participants consisted of 2 texts with 27 gaps each.

Based on their scores of the C-test, the participants were classified into 3 levels: Upper group (more than 40 points out of 54), Middle group (between 40 and 31 points) and Lower group (below 31 points).

Table 5.2

C-test Scores of Participants

Level	<i>N</i>	<i>M</i> (max. <i>n</i> = 54)	<i>SD</i>
Lower group	14	24.86	4.54
Middle group	13	36.92	3.07
Upper group	12	44.50	3.12
Total	39	34.92	8.97

5.2.4.2 Target Linguistic Forms

Based on the discussion in 5.2.2.1, 12 linguistic forms were selected. They are classified into two categories: New lexical items and familiar forms with new meanings.

For the new lexical items, the Standard Vocabulary List was consulted to choose the candidates. It is a vocabulary list compiled by ALC Inc (see <http://www.alc.co.jp/> for more information). The candidates should be lexical items on which the participants do not have any partial knowledge. In selecting linguistic forms on which the participants have some partial knowledge, *The BBI Dictionary of English Word Combination* and Asahi Press SENTENCE were consulted. Asahi Press SENTENCE is a database of Japanese-English sentence equivalents (see <http://www.asahipress.com/e-park/> for more information). Linguistic forms which seemed difficult for the participants to produce correctly were selected. The 12 linguistic forms are in Appendix A.

5.2.4.3 Procedure for Collecting Data

The participants had been informed of the procedure of the survey in advance. The procedure for collecting data is as follows:

Stage 1. A Japanese sentence is shown to the participants on a screen. (5 sec.)

Stage 2. The participants write down the thought processes that occur while trying to put the Japanese sentence into English. (90 sec.)

Stage 3. The participants write down the final output (Output 1). (45 sec.)

Stage 4. A model sentence is shown to the participants on a screen. (5 sec.)

Stage 5. The participants write down what they have noticed in the model sentence. (60 sec.)

Stage 6. A posttest is given in the next week without previous notice (Output 2).

The posttest was a written test, where the same Japanese sentences were shown to the participants and they put them into English. It was up to each participant whether s/he would use the expressions in the model sentences. A production test was given to confirm that noticing a hole and noticing a form would help learners of English incorporate linguistic forms to such an extent that they could produce them on their own.

5.2.4.4 Number of Linguistic Forms to Be Analyzed

Thirty-nine participants took part in the experiment and 12 linguistic forms were employed. That means there were 468 linguistic forms to be analyzed in total. Five of them were excluded from the analysis because the participants had already known the target forms in the 5 cases, where the participants did not notice a hole and mentioned that they used the expressions they already knew. One hundred and fifty-six new lexical items and 307 familiar forms with new meanings were obtained to be analyzed.

5.2.4.5 Analysis

Reliable criteria are necessary to judge whether the participants noticed a hole, they noticed a form and they incorporated the target linguistic form. Two investigators independently analyzed six randomly chosen participants' written reports and subsequently discussed their results. The six randomly chosen participants consisted of two Lower group participants, two Middle group participants and two Upper

group participants. The following criteria were established for the analysis:

- (1) The participants noticed a hole if s/he extracted the target part precisely and mentioned how to realize it linguistically in the description of his or her thought processes.
- (2) The participants noticed a form in a model sentence if s/he mentioned the target part metalinguistically and mapped the target form with its appropriate meaning in the comments on model sentences.
- (3) The incorporation of target forms occurred if the participants produced the target forms correctly in the written posttest. If the participants used other expressions than the target forms in the posttest, the incorporation of target forms did not occur.

Following the above criteria, the first investigator analyzed all the data. The second investigator independently analyzed 9 participants' written reports. Agreement rates were: 88.9% for noticing a hole, 92.6% for noticing a form, and 98.1% for the incorporation of target forms. The third investigator analyzed the written reports on which the two investigators had not reached agreement and made suggestions. The first investigator made the final decision based on the suggestions.

5.2.5 Results

5.2.5.1 Incorporation of New Lexical Items

There was only one case where a participant used the target lexical item in the posttest. Irrespective of their levels, almost all the participants noticed new lexical items when they looked at the model sentences. In more than 80% of all the cases, the target parts were realized as problems. It is reasonable to conclude that new lexical items were noticeable enough to attract the participants' attention. However, they were not incorporated through the output-input activity.

Only one Middle group participant used the lexical item *mutilate* in the posttest correctly. However, he wrote down that he had seen the lexical item before when he looked at the model sentence. It means

that the lexical item was not a completely new linguistic form for the participant. Several participants did the same. They used the lexical items they had noticed in the model sentences in the posttest though they were not the target linguistic forms. They also mentioned that they had learned the lexical items before in looking at the model sentences. The results suggest that L2 learners do not incorporate completely new lexical items into their IL system through the output-input activity. Fuller discussion of learning new lexical items will be presented in Chapter 6.

5.2.5.2 Relationship Between Noticing a Hole and Noticing a Form

Noticing a hole is considered to trigger noticing a form. If a certain part is realized as a problem, its correspondent in a model sentence is more likely to be a focus of attention.

The participants' written reports, however, did not reflect this. After the posttest, 3 participants were interviewed to know what they had actually thought at Stages 2 and 5. Two of them said, "At Stage 5, I referred to what I had not mentioned at Stage 2." The analysis of all the written reports suggested that a considerable number of the participants had done the same. According to the second criterion proposed in 5.2.4.5, it has to be interpreted that they did not notice a form. Yet the interpretation is superficial. Although it is reasonable to think that the participants noticed forms in model sentences but did not mention them, there is no hard evidence to prove it. As it is impossible to discuss how noticing a hole triggered noticing a form, how noticing a hole and noticing a form encouraged the incorporation of linguistic forms will be dealt with respectively.

5.2.5.3 Relationship Between Noticing a Hole and Incorporation

The term *noticing a hole* is applied to mean having difficulty in realizing intended messages linguistically. It is generally considered that learners with low proficiency realize more problems because of their limited linguistic resources. It should be noted, however, that learners with high proficiency also realize a problem during output.

During output, learners are assumed to experience difficulty, or notice a hole, at various levels. Learners with low proficiency, for example, may have difficulty retrieving a lexical item to convey their intended meaning. They may not be able to realize their intended meaning at all. Learners with high proficiency, on the other hand, may have difficulty putting a selected lexical item into a well-formed sentence. They may try to retrieve a better phrasing, feel that their linguistic realization might deviate from the norm of the TL system or create a new form based on their existing knowledge on the TL.

Table 5.3

Contingency Table of Noticing a Hole and Incorporation

		Incorporation		Total
		(+)	(-)	
Noticing a hole	(+)	101	94	195
	(-)	23	89	112
Total		124	183	307

Table 5.3 indicates how noticing a hole encourages the participants to incorporate linguistic forms. Of the 195 cases where they noticed a hole, the participants used the target forms in the posttest in 101 cases. On the other hand, of the 112 cases where they did not, the participants used the target forms in only 23 cases. The results of statistical analysis show that noticing a hole and the incorporation of linguistic forms are not independent, $\chi^2(1, N = 307) = 27.588, p = 0.000$. It can be concluded that noticing a hole during output encourages learners to incorporate linguistic forms.

5.2.5.4 Relationship Between Noticing a Form and Incorporation

Table 5.4 shows how noticing a form encourages the participants to incorporate linguistic forms. Of the 178 cases where they noticed a form, the participants used the target form in the posttest in 100 cases. Of

the 129 cases where they did not notice a form, however, the participants used the target form in only 26 cases.

Table 5.4

Contingency Table of Noticing a Form and Incorporation

		Incorporation		Total
		(+)	(-)	
Noticing a form	(+)	100	78	178
	(-)	26	103	129
Total		126	181	307

The results of statistical analysis show that noticing a form and the incorporation of linguistic forms are not independent, $\chi^2(1, N = 307) = 38.639, p = 0.000$. It can be concluded that noticing a form encourages learners to incorporate linguistic forms.

5.2.5.5 Learners' Proficiency and Incorporation of Linguistic Forms

Table 5.5 shows the mean scores on the posttest of the participants with different proficiency levels. It does not include the new lexical items because they were not incorporated at all except in only one case as discussed in 5.2.5.1.

Although the performance scores of the three levels were not significantly different from each other ($H = 3.684, df = 2, p = 0.158$), learners with high proficiency incorporated more target linguistic forms than those with low proficiency.

Though the result was not statistically significant, the descriptive statistics suggest that learners with high proficiency are likely to incorporate more linguistic forms than learners with low proficiency through the output-input activity.

Table 5.5

Mean Incorporation Scores of Participants With Different Levels

Level	<i>N</i>	<i>M</i> (max. <i>n</i> = 8)	<i>SD</i>
Lower group	14	3.00	1.04
Middle group	13	3.46	1.33
Upper group	12	3.75	1.22
Total	39	3.38	1.21

5.2.6 Discussion

The major findings of Study 1 are: (1) Noticing a hole and noticing a form prompt the immediate incorporation of linguistic forms and play an important role in mapping already learned forms with the new meanings and (2) The output-input activity is likely to lead learners with high proficiency to incorporate more linguistic forms.

The first finding is concerned with how noticing contributes to L2 learning. As Tables 5.3 and 5.4 show, the participants reproduced the target forms in the posttest more successfully when they noticed a hole during output and/or they noticed a form in the model sentences. It is worth stating that noticing a hole and noticing a form help learners of English develop the ability to use linguistic forms on their own.

Completely new linguistic forms, or new lexical items in the study, were not incorporated at all. The output-input activity did not enable the participants to reproduce the target new lexical items in the posttest. However, it does not mean that the activity does not contribute to learning lexical items at all. Some participants used the lexical items which they had noticed in the model sentences in the posttest. A participant, for example, used the word *burglars* in the posttest though she was not able to use it at Stage 2. When she looked at the model sentence, she reported that she had learned the lexical item before but could not remember it. In this case, she noticed a form and incorporated it. Eleven similar examples were found in the study, including the example discussed in 5.2.5.1. Though further research is indispensable, it is

possible to hypothesize that the output-input activity contributes to vocabulary learning in the way that it enables learners to retrieve lexical items that have already been learned but not yet integrated.

The second finding is concerned with how learners' proficiency in English influences the incorporation of target linguistic forms. As Table 5.5 indicates, learners with high proficiency used more target forms in the posttest. In the study, the participants were not allowed to use dictionaries. They solved the problems which they had encountered during production and analyzed the model sentences only with their currently held linguistic knowledge. To put it more precisely, they processed the meaning that should be communicated so that they could convey it with their linguistic knowledge at Stage 2. At Stage 5, they analyzed the model sentences, compared them with their own output and mapped the target forms with their meanings.

In looking at the expression *travel light*, for example, an Upper group participant, after mapping the form with its meaning successfully, reported that he had learned that the lexical item *light* could be used as an adverb. Another participant of the same group directed his attention to the similarity between his own output and the model sentence and incorporated the target form by comparing them. The point is that the Upper group participants' reports on model sentences are more elaborate and detailed than those of the participants with low proficiency. On the other hand, the Lower group participants sometimes had difficulty in understanding why a form bears a certain meaning because of their limited linguistic resources. For example, one Lower group participant reported that he did not understand why the expression *travel light* could be used to mean traveling without taking a lot of baggage. In this case, the target form was not incorporated.

For learners to perform analytic operations such as drawing inferences, comparing and classifying, they have to resort to their currently held knowledge. As Marzano (2001) has acutely pointed out, the success of the process where new knowledge gets systematized resting on present knowledge is highly dependent on the amount of the latter. This explains why the Upper group participants incorporated more linguistic forms in the study. It is possible to conclude that their good prior knowledge on English helped

them incorporate target forms more successfully.

5.2.7 Conclusion

Skehan (1998) suggests three factors in foreign language aptitude: The ability to notice what is in input, the ability to analyze language and the ability to retrieve chunks from memory for fluent speech production. The first two abilities can be fostered by noticing a form in model sentences. Noticing a hole fills the role of triggering noticing a form. Both noticing a hole and noticing a form play a crucial role in L2 learning. Though further research is required to show how noticing contributes to L2 learning, the results of Study 1 indicate that output and noticing triggered by output contribute to the incorporation of linguistic forms.

5.3 Study 2

5.3.1 Aim

Most discussions regarding the role of noticing in IL development focused on morphology and syntax and only a few have dealt with lexical learning and pragmatic development (Schmidt, 2001). This is where the primary concern of this study lies. Study 2 tests Hypotheses 1, 3, 4 and 6 and aims to investigate how noticing a form in relevant input presented immediately after producing output encourages learners of English to incorporate lexical items into their IL system.

5.3.2 Theoretical Background

5.3.2.1 Output and Noticing in L2 Learning

As discussed in Chapters 2 and 3, both output and noticing play crucial roles in developing L2 learners' IL system. It is worth noting, however, that not all circumstances of output induce learners to gain new knowledge on the TL. In a casual conversation, for example, learners can avoid using problematic linguistic forms, yet gain their communicative success. "Pushed output," which induces learners to notice

their linguistic holes, is a prerequisite for learning new knowledge on the TL (Swain, 1993). If learners are pushed to produce output and immediately provided with relevant input, it is likely that the sensitivity toward the form may be heightened through output, which may, in turn, prompt them to attend to the relevant parts in the relevant input.

As for how producing output contributes to L2 learning, Izumi (2002) proves empirically that learners who produced output demonstrate greater learning of the target form than those who were not required to produce output. He has demonstrated that providing relevant input after producing output has a significant impact on the learning of English (see 2.6.4 for further details).

Production has a role of raising learners' awareness of problematity, which makes learners more sensitive to what they can and cannot say or write. Noticing a problem leads learners to be more attentive to relevant linguistic forms in input. Concerning how noticing contributes to IL development, Iwanaka and Takatsuka (2006) show that both noticing a hole and noticing a form prompt the immediate incorporation of linguistic forms and play an important role in mapping already learned forms with their new meanings.

5.3.2.2 Learners' English Proficiency and Analysis Triggered by Noticing

While learners with high proficiency have more capacity to attend to details such as morphological forms, pragmatics and discourse structuring, learners with low proficiency cannot pay attention to all meaningful differences at once because they are cognitively overloaded. They have not acquired easy access to linguistic forms. Even if the same input is provided after producing output, it is not likely that both learners with high proficiency and learners with low proficiency experience the same degree of noticing.

It is likely that learners with high proficiency notice what learners with low proficiency do not. Ample knowledge on the TL is likely to make the analysis triggered by noticing more detailed and elaborate. Learners with high proficiency may receive more benefits from the output-input activity than learners with low proficiency.

5.3.2.3 Aspects of Knowing a Lexical Item

Knowing a lexical item involves three aspects: Form, meaning and use (Nation, 2001). Which aspect of knowing a lexical item does the output-input activity foster? For L2 learners to be able to produce grammatically correct output, they have to know what patterns they have to use a certain lexical item and what lexical items or types of lexical items they have to use with a certain lexical item in question.

As producing output is considered to raise learners' awareness of how a lexical item should be used in a sentence and move them to a syntactic mode (see 4.2.1 for further details), the output-input activity is likely to help learners develop lexical knowledge on use.

5.3.3 Research Questions

Based on the above discussion, the following research questions were formulated:

- (1) What do learners do when they notice a form and what cognitive activities triggered by noticing contribute to the incorporation of the form?
- (2) Does learners' proficiency in English influence the cognitive activities triggered by noticing a form?
As a result, does that influence the incorporation of the form?
- (3) Which aspect of knowing a lexical item does noticing during the output-input activity foster, knowledge on form, meaning or use?

5.3.4 Methodology

5.3.4.1 Task Design

To evaluate the effects of producing output on IL development properly, the task to be employed in the study should fulfill the following requirements: (1) Participants have the freedom to choose what linguistic forms to use, (2) Participants have choices to decide what forms are relevant to their developing IL system and (3) Individual variation in output is minimal.

The first proviso takes the nature of output process into consideration. Producing language is basically meaning-oriented and it is unrealistic that linguistic forms are pre-decided before generating meaning. The second requirement takes account of the participants' developmental stages, or individual variation. It should be up to each participant to decide what forms are important to develop his or her IL system. For this reason, I did not choose target linguistic forms in advance. The third condition is important to maximize the effects of producing output on IL development. An essay-writing task, for example, is susceptible to individual variation. An output task is necessary which leads learners to contrast their linguistic realizations with their counterparts in relevant input. Taking the above factors into consideration, I decided on guided composition.

5.3.4.2 Participants

Twenty-nine Japanese learners of English participated in the study. They were undergraduate students who were not majoring in English. They were classified into three levels based on their English proficiency: Upper group, Middle group and Lower group. Table 5.6 shows the mean scores on the proficiency test of the participants with different levels.

Table 5.6

Mean Scores on Proficiency Test

Group	<i>N</i>	<i>M</i> (max = 166)	<i>SD</i>
Lower group	10	68.67	19.34
Middle group	10	110.70	8.71
Upper group	9	136.20	7.41
Total	29	106.45	30.50

Two kinds of proficiency tests were employed: A C-test and a reading comprehension test. The C-test

given to the participants consisted of two texts with 33 gaps each, with every 11th word deleted. To evaluate the participants' reading proficiency, a past entrance examination to a university was employed with permission from the university. It consisted of 40 questions and the participants were given scores from 0 to 100. The proficiency levels of the three groups were found to be significantly different from each other, $F(2, 26) = 68.247, p < .05$.

5.3.4.3 Procedure for Collecting Data

As mentioned above, guided composition was employed for the task. The participants were directed to write a passage to describe a sightseeing spot to one of his or her foreign friends. The passage consisted of five paragraphs, each of which had a few pieces of information that the participants had to encode. It was up to each participant what linguistic forms to use. The participants had been informed of the task procedure in advance. The procedure for collecting data is as follows:

Stage 1. The participants work on the guided composition and write a passage describing a sightseeing spot (Output 1).

Stage 2. The participants are provided with relevant input.

Stage 3. The participants underline parts of the relevant input which they think are necessary to improve their writing ability and write down what they have noticed about the underlined parts.

Stage 4. The participants work on the same guided composition as that of Stage 1 in the next week without previous notice (Output 2).

It was up to each participant whether s/he would use the expressions from the relevant input at Stage 4. Productive learning is generally considered to be more difficult than receptive learning because the former requires extra learning of new output patterns (Crow, 1986). Learners may only need to know linguistic forms partially for receptive use. For productive purposes, on the other hand, their knowledge on linguistic

forms has to be more precise (see 2.4 for further details).

In order to confirm that the output-input activity would help learners of English acquire productive knowledge of lexical items, the participants worked on the same guided composition at Stage 4. Productive tests should be employed to evaluate learners' productive ability.

5.3.4.4 Number of Data to Be Analyzed

Reliable criteria are necessary to judge whether the participants noticed a form in the model passage and they incorporated the form in their IL system. The following criteria were established for the analysis:

- (1) The participants noticed a form in the model passage if: i) S/he underlined a part and mapped the part with its appropriate meaning and/or ii) S/he underlined a part and mentioned that s/he did not know the expression.
- (2) The participants incorporated the form if they produced it correctly in Output 2.

Following the above criteria, three investigators independently analyzed all the data. Though there were discrepancies in judging whether noticing a form occurred, there were 342 cases where all the three investigators agreed. The 342 cases were used for further analysis. Although there were quite a few cases where only two investigators reached a consensus, the cases were not used for further analysis. There were few discrepancies in judging whether a form was incorporated or not.

As discussed in 4.4.3, learners with high proficiency are considered to notice more forms because they have more capacity to process input. Learners with low proficiency, on the other hand, cannot pay their attention to linguistic forms in input efficiently because they are cognitively overloaded. Though there was a tendency that the Lower group participants noticed less forms than the Middle group and the Upper group participants, the difference was not statistically significant, $F(2, 26) = 3.122, p = .061$. Table 5.7 shows mean noticing scores of participants with different levels.

Table 5.7

Mean Noticing Scores of Participants With Different Levels

Group	<i>N</i>	<i>M</i>	<i>SD</i>	Min.	Max.
Lower group	10	8.8	3.2	5	14
Middle group	10	13.2	5.3	7	26
Upper group	9	12.8	4.2	6	19
Total	29	11.6	4.6	5	26

5.3.4.5 Analysis

At Stage 3, the participants underlined parts of the relevant input. The underlined parts reflect their interest in linguistic forms. The parts are considered to be sources of variation that matter to them.

The three investigators first picked up all the underlined, or noticed, parts. Then a comparison was made between Output 1 and Output 2 of the noticed parts. The analysis by the three investigators put the 342 data into three groups: Incorporation, No-incorporation and Others. Each of them is defined as follows:

- (1) Incorporation: The cases where the participants used a form from the model passage correctly in Output 2 fall into this group.
- (2) No-incorporation: The cases where the participants used the same form, which is different from the counterpart in the model passage, both in Output 1 and Output 2 fall into this group.
- (3) Others: The cases which do not belong to either Incorporation or No-incorporation fall into this group.

Of the 342 data, 93 fell into Incorporation, 124 into No-incorporation, and 125 into Others. Let us look at a typical example belonging to the third group. In looking at the expression *is located between Okayama and Hiroshima*, for example, a participant underlined the part and mapped the form with its meaning. At

Stage 4, he used the expression *is locate between Okayama and Hiroshima*. He tried in vain to use the form from the model passage. Examples like this were abundant and they also show that the output-input activity influences learners' IL development along with the examples of the first group.

In order to clarify what cognitive activities encourage participants to incorporate lexical items, a qualitative analysis was given to the 342 data. The participants' cognitive activities triggered by noticing were classified into two categories: A semantic analysis and a syntactic analysis. In the former, the participants mapped a form with its appropriate meaning. In the latter, the participants commented on how a form should be used in a sentence.

5.3.5 Results

The analysis of the data showed three findings. The first finding is concerned with the relationship between the participants' proficiency and incorporation scores. Table 5.8 shows the mean incorporation scores of the participants with different levels. As discussed in 5.3.2.2, the Upper group participants incorporated more linguistic forms from the relevant input into their IL system than the Middle and the Lower group participants, $F(2, 26) = 3.771, p = .036$. Bonferroni's multiple comparison showed that the effect of learners' proficiency was statistically significant between the Upper group participants and the Lower group participants at an alpha level of .05.

Table 5.8

Mean Incorporation Scores of Participants With Different Levels

Group	<i>N</i>	<i>M</i>	<i>SD</i>
Lower group	10	2.10	0.99
Middle group	10	3.10	1.91
Upper group	9	4.44	2.46
Total	29	3.17	2.04

The second finding is about the effects of cognitive activities triggered by noticing on incorporation. When the participants had partial knowledge on a linguistic form, they often commented on how the linguistic form should be used in a sentence. In other words, they commented on syntax, such as “*Edo-period* can be used as an adjective,” “*Against* is necessary after *fight*,” and “*Serves* can have an inanimate thing as its subject.” Table 5.9 indicates how a syntactic analysis of a form promotes the incorporation of it.

Table 5.9

Contingency Table of Syntactic Analysis and Incorporation

		Incorporation		Total
		(+)	(-)	
Syntactic Analysis	(+)	74	98	172
	(-)	19	151	170
Total		93	249	342

When the participants commented on how a lexical item is used in a sentence, the part was produced more successfully than when the participants commented on only form-meaning relationship. This result accords with Izumi (2003), who points out that an analysis at the level of meaning is not as useful for intake as an analysis at the level of syntax. The results of a statistical analysis show that a syntactic analysis of a form and the incorporation of it are not independent, $\chi^2(1, N = 342) = 43.798, p = .000$.

There were 19 cases where the participants used forms from the relevant input correctly without a syntactic analysis. In these cases, the participants perceived a form in the model as being in contrast with its counterpart in their own output and realized ungrammatical or less appropriate status of the latter.

Take the expression *bullet train*, for example. Though no participants used it at Stage 1, 6 participants used it correctly at Stage 4. Their comments in looking at *bullet train* at Stage 3 were: “I did

not know this expression,” “I have to use this expression from now on,” “This expression describes *shinkansen* properly” and so on. These comments indicate that they felt it necessary to incorporate the form.

On the other hand, some participants did not feel the necessity to learn it, which was reflected in their comments. Typical examples were: “I remember that the term *superexpress* was used in a train” and “*Shinkansen* should be thought of as a proper noun.” In these cases, the participants did not incorporate the form.

The third finding is concerned with which aspect of knowing a lexical item is gained through the output-input activity. Of the 93 cases, the participants took new lexical items into their IL system in 19 cases. In these cases, they did not have any partial knowledge on the lexical items which they took in before they were provided with the model passage. Although new lexical items were noticeable enough to draw participants’ attention, the number of incorporation was rather small. For example, more than 20 participants underlined words such as *bullet train*, *canal*, *ogres* and *pottery* in the model passage and mapped the forms with their appropriate meanings.

When the participants noticed new lexical items, the most prevailing cognitive activity was to map the forms with their appropriate meanings, or a semantic analysis. It is generally true that a semantic analysis alone is not likely to lead to the incorporation of lexical items. In the other 74 cases, the participants had partial knowledge on the lexical items which they took in before they were provided with the relevant input. In these cases, instead of establishing a form-meaning relationship, the participants allocated their attentional resources to such aspects as what lexical items should be used with the lexical item in question and in what patterns the lexical item in question should occur. As discussed above, such cognitive activities have a great influence on the incorporation of linguistic forms. Although such cognitive activities rarely happen in looking at completely new lexical items, they are suitable for learning how a lexical item should be used in a sentence.

The findings can be summarized as follows: (1) The output-input activity leads learners with high

proficiency to incorporate more linguistic forms, (2) The incorporation of linguistic forms is promoted when: i) The participants analyze a form in the relevant input syntactically, and/or ii) The participants perceive a form in the model as being in contrast with its counterpart in their own output and realize ungrammatical or less appropriate status of the latter and (3) The output-input activity helps learners gain lexical knowledge on use.

5.3.6 Discussion

The first finding is concerned with the relationship between learners' proficiency and the incorporation of linguistic forms. To explain why the Upper group participants could incorporate more linguistic forms, it is necessary to consider the role of analysis triggered by noticing.

In the study, the participants were not allowed to use dictionaries. When they noticed a form in the relevant input, they analyzed it only with their currently held knowledge. As mentioned in 5.2.6, they could depend only on their prior knowledge for performing analytic operations such as making inferences, comparing and classifying. When new knowledge gets internalized resting on present knowledge, the amount of the latter plays a crucial part in the success of the process (Marzano, 2001). This explains why the Upper group participants produced more targetlike forms in Output 2. Their good prior knowledge on English encouraged them to incorporate linguistic forms more successfully.

The second and the third findings are interrelated and both are concerned with the role of a syntactic analysis in L2 learning. As discussed in 4.2.1, producing output requires learners to make a syntactic analysis of a linguistic form. During comprehension, on the other hand, learners are primarily engaged in a semantic analysis. Learners cannot circumvent syntactic information in the production process.

Of the 93 cases where the participants incorporated targetlike linguistic forms into their IL system, the participants acquired knowledge on how a linguistic form should be used in a sentence in as many as 74 cases. It is plausible to consider that the participants were primed to think about syntax during production and search for accurate phrasing for conveying an intended meaning. This cognitive process

left a trace in their memory, which made them ready to search for relevant information in future input. When the relevant input was provided to them, the trace in their memory led them to search for syntactic information which is necessary for accurate production.

It should be noted that noticing a form caused by producing output may differ from noticing a form caused by comprehension. The former is likely to lead learners to notice how a lexical item should be used in a sentence. This is probably where roles of producing output are different from those of comprehension. While comprehension activities offer learners opportunities to make use of various sources such as linguistic knowledge and general knowledge, output activities require learners to depend only on their linguistic knowledge to attain their goals.

Although further research is required, the results of Study 2 indicate that producing output helps learners promote knowledge concerning how a lexical item should be used in a sentence.

5.3.7 Conclusion

Though producing output and noticing play important roles in IL development, it is necessary to note that the method which was employed to investigate the effects of producing output and noticing on IL development also triggered the incorporation of linguistic forms to some extent. At Stage 3, the participants underlined a part in the model passage and wrote down what they had noticed. It is likely that this also contributed to the incorporation of linguistic forms along with producing output and noticing.

Though further research is required, the findings of Study 2 show that producing output and noticing triggered by output help learners take linguistic forms into their IL system. Exposure to relevant input immediately after producing output offers learners of English an opportunity to contrast their own linguistic realizations with their counterparts. Immediate juxtaposition of their own production and the model is considered to offer an ideal situation for developing learners' IL system (Saxton, 1997). The results also suggest that producing output and noticing triggered by producing output are likely to help learners of English acquire the ability to produce the TL on their own.

5.4 Study 3

5.4.1 Aim

This study tests Hypotheses 1, 2, 3, 4 and 5 and investigates how noticing a form in relevant input presented immediately after producing output encourages Japanese learners of English to incorporate grammatical forms. Thirty-eight undergraduate students, classified into three proficiency levels, took part in an experiment, in which they worked on dicto-comp and then took notes of what forms they had noticed in looking at the relevant input presented immediately after producing output. The participants worked on the same dicto-comp in the following week without previous notice.

5.4.2 Theoretical Background

5.4.2.1 Output

It is self-evident that L2 learners should be exposed to enough input for successful L2 learning. However, researchers differ in their opinions as to whether being exposed to enough input alone is sufficient for L2 learners to develop the ability to use the TL correctly and appropriately.

Krashen (1994), for example, emphasizes the importance of comprehensible input and asserts that teachers' correction and learners' output do not contribute to the IL development. Long (1981) has also considered that it is not output but input that brings about the IL development. Swain (1985) has questioned the widely accepted assumption that the ability to produce the TL is not a process of learning but a result of learning and asserted that producing output is also an important process of L2 learning. She has pointed out that immersion learners, in spite of their "acquisition-rich input" (Swain, 2000, p.99), do not acquire the ability to produce grammatically correct output.

Quite a few researchers have tried to clarify causative influences of producing output on L2 learning and they basically agree that producing output contributes to the desirable IL development (see 2.6 for further details). Although it is safe to say that producing output contributes to the desirable IL development, different output conditions have different learning effects. Just speaking or writing with fully

proceduralized linguistic knowledge, for example, does not provide learners with opportunities to stretch their IL system to meet communicative goals (Swain, 1993). As Tarone and Liu (1995) have pointed out, learners' IL system is most likely to change when they realize that they do not have the linguistic resource to meet their necessity, or notice a hole. For producing output to be a process of L2 learning, learners have to notice the linguistic deficiency of their IL system.

5.4.2.2 Noticing

Peters (1998) asserts that noticing is a necessary cognitive process in every domain of language learning (phonology, grammar, vocabulary and discourse structuring). Sawyer and Ranta (2001) regard noticing as one of the important language learning aptitudes. This view of noticing, however, has not been accepted by all researchers. For example, connectionists assume that learning takes place through the strengthening and weakening of the interconnections in a particular network in response to examples encountered in input. They consider that learning is automatic and implicit.

Tomlin and Villa (1994) have argued that detected information can be registered in memory and that detection is enough for L2 learning. As mentioned in 3.3, detection occurs at a subliminal level. Although opinions differ as to the indispensability of noticing in L2 learning, many researchers agree that noticing facilitates the process of L2 learning (Robinson, 2003). Iwanaka and Takatsuka (2006) have examined how noticing a hole and noticing a form influence the incorporation of linguistic forms and concluded that both noticing a hole during output and noticing a form in input contribute to L2 learning. Results of a number of recent studies using verbal reports as data appear to support the importance of noticing in L2 learning and noticing can be regarded as an important cognitive process.

5.4.2.3 Output and Noticing in L2 Learning

Exposure to relevant input immediately after producing output provides learners with an opportunity to contrast their own linguistic realizations with their target counterparts in the input. This opportunity is

likely to lead them to notice less appropriate status of their own linguistic realizations and encourage them to replace their currently held forms with their target forms. Researches on corrective feedback and recasts seem to suggest that the output-input activity is likely to contribute to IL development (Ayoun, 2004; R. Ellis, Loewen & Erlam, 2006). Further research needs to clarify what linguistic forms are incorporated through the output-input activity, what individual learner factors influence the success of learning through the output-input activity and so forth.

5.4.3 Research Questions

This study has three research questions. The first question is concerned with noticing, which addresses the correlation of noticing a form and the incorporation of the form.

(1) Does noticing a form contribute to the incorporation of linguistic forms?

The second question is concerned with learners' proficiency. In Iwanaka and Takatsuka (2006, 2007), learners with higher proficiency incorporated more linguistic forms through the output-input activity. The second research question addresses this issue again to reconfirm the results of the two studies.

(2) Does learners' proficiency influence the incorporation of linguistic forms?

The third question is concerned with a cognitive comparison. A cognitive comparison plays an important role in L2 learning (see 4.2.3 for further details). The similarity between a learner's linguistic realization and its counterpart in relevant input is considered to trigger a cognitive comparison. It is probable that the resemblance triggers a cognitive comparison, which brings about the incorporation of linguistic forms.

(3) Does the resemblance between a learner's linguistic realization and its counterpart in relevant input

promote the incorporation of linguistic forms?

5.4.4 Methodology

5.4.4.1 Task Design

In choosing an output task, the following conditions were taken into consideration: (1) The participants pay attention to both form and meaning during output, (2) The participants can choose what linguistic forms to use and (3) Individual variation in output is minimal. The output task chosen to collect data is dicto-comp. It is “a technique for practicing composition in language classes. A passage is read to a class, and then the students must write out what they understand and remember from the passage, keeping as closely to the original as possible but using their own words where necessary” (Richards & Schmidt, 2002, p.157).

5.4.4.2 Participants

Thirty-eight Japanese learners of English (paid volunteers) took part in the experiment. Table 5.10 shows the mean scores on the proficiency test of the participants with different levels.

Table 5.10

Mean Scores on Proficiency Test

Group	<i>N</i>	<i>M</i> (max = 100)	<i>SD</i>
Lower group	13	65.54	4.25
Middle group	13	78.08	2.43
Upper group	12	87.58	4.60
Total	38	76.79	9.85

The participants were undergraduate students whose ages were from 18 to 22. No English majors were

included in the participants. To evaluate the participants' proficiency in English, a past entrance examination to a university was employed with permission from the university. It consisted of 40 questions and the participants were given scores from 0 to 100. The proficiency levels of the three groups were found to be significantly different from each other, $F(2, 35) = 102.945, p = .000$.

5.4.4.3 Target Linguistic Forms

For an output activity to contribute to L2 learning, learners need to experience difficulty during output, which means that grammatical forms which Japanese learners of English still make errors even at the university level are good candidates. In choosing the target grammatical forms, Okada (2003) was consulted. The selected grammatical forms are: The hypothetical past perfective, the relative pronoun, the inanimate subject and the comparison. The four grammatical forms are in Appendix C (for grammatical terms, refer to Quirk, Greenbaum, Leech, & Svartvik, 1985).

5.4.4.4 Procedure for Collecting Data

The participants were informed of the procedure in advance so that they can make the best use of their linguistic resources for the task. The procedure for collecting data is as follows:

- Stage 1. A sentence is read to the participants twice and they write down what they understand and remember from the sentence.
- Stage 2. Based on what they have written down at Stage 1 and the Japanese translation of the sentence, the participants complete their output (Output 1).
- Stage 3. The participants are provided with relevant input.
- Stage 4. The participants underline parts of the relevant input which they think are necessary to improve their English and write down what they have noticed about the underlined parts.
- Stage 5. The participants work on the same translation task as that of Stage 2 in the next week without

previous notice (Output 2).

5.4.4.5 Analysis

5.4.4.5.1 Operationalization

Reliable criteria are necessary to judge noticing and incorporation precisely. Noticing a form and the incorporation of a linguistic form were operationalized as follows:

- (1) The participants noticed a form in the relevant input if s/he underlined a part and: i) Mapped the part with its appropriate meaning, ii) Mentioned that s/he did not know the expression and/or iii) S/he mentioned the part metalinguistically at Stage 4.
- (2) The participants incorporated a form from the relevant input if they produced it correctly at Stage 5.

5.4.4.5.2 Procedure for Analysis

In order for the data analysis to be reliable, three investigators independently analyzed all the data based on the above operationalization. After analyzing the data, the results of the analysis were checked against from each other.

There were some disagreements between the three investigators. The disagreed protocols were discussed separately to get agreement. When the three investigators did not reach a consensus, the protocols were not used as the data for further analysis. The details of the analysis are as follows:

- (1) The parts where the participants underlined are inspected and put into two groups: Noticing and No-noticing.
- (2) The participants' linguistic realizations of the target parts in Output 2 are examined and put into three groups: Successful incorporation, Unsuccessful incorporation and Others. They are defined as follows:

- (i) Successful incorporation: The cases where the participants use a grammatical form from the relevant input correctly in Output 2 fall into this group.
 - (ii) Unsuccessful incorporation: The cases where the participants attempt to use a grammatical form from the relevant input in vain in Output 2 fall into this group.
 - (iii) Others: The cases which do not belong to either Successful incorporation or Unsuccessful incorporation fall into this group.
- (2') Each participant's performance in Output 2 is quantified based on the following scoring: 1 point for Successful incorporation, 0.5 point for Unsuccessful incorporation and 0 point for Others.
- (3) The participants' linguistic realizations in Output 1 are examined from a perspective whether they bear a resemblance to their target forms and put into two groups: With resemblance (noted as +resemblance) and Without resemblance (noted as -resemblance).
- (4) The participants' comments are analyzed qualitatively and factors which are likely to promote the incorporation of grammatical forms are clarified.

5.4.4.5.3 Number of Protocols to Be analyzed

Thirty-eight participants took part in the study and four grammatical forms were chosen as target linguistic forms. There were 20 cases where the participants used the target grammatical forms in Output 1. They were excluded from the further analysis. It follows that the number of data to receive further analysis has become 132.

5.4.5 Results

The first result is concerned with noticing and learners' proficiency in the TL. The ability to notice what is in input is considered to improve as learners' proficiency gets better. Their proficiency in the TL determines what aspects of input learners draw their attentional resources to. It is likely that learners with low proficiency are cognitively overloaded and that most of their attentional resources are drawn to lexical

items in input. As learners' proficiency in the TL improves, they have more attentional resources available and can pay attention to collocations, grammatical forms and so forth. In this study, grammatical forms were employed as the target linguistic forms, which required the participants to notice something other than lexical items.

Table 5.11 shows the mean noticing scores of the participants with different levels. Although the descriptive statistics show that the participants with high proficiency notice more forms than the participants with low proficiency, the noticing scores of the three levels are not significantly different from each other, $F(2,35) = 2.619$, $p = .087$.

Table 5.11
Mean Noticing Scores of Participants With Different Levels

Group	<i>N</i>	<i>M</i> (max = 4)	<i>SD</i>
Lower group	13	1.31	1.18
Middle group	13	2.23	1.42
Upper group	12	2.42	1.31
Total	38	1.97	1.37

The second finding is concerned with the relationship between the participants' proficiency in the TL and the incorporation of target grammatical forms. Following the procedure described in 5.4.4.5.2, each participant's performance in Output 2 was quantified. Table 5.12 shows the mean incorporation scores of the participants with different levels.

As the table shows, the Upper group participants incorporated more target grammatical forms in Output 2 than the Middle group and the Lower group participants, $F(2, 35) = 3.972$, $p = .028$. Bonferroni's multiple comparison showed that the effect of the participants' proficiency was statistically significant between the Upper group participants and the Lower group participants at an alpha level of .05.

Table 5.12

Mean Incorporation Scores of Participants With Different Levels

Group	<i>N</i>	<i>M</i>	<i>SD</i>
Lower group	13	0.81	0.80
Middle group	13	1.23	0.93
Upper group	12	1.71	0.62
Total	38	1.24	0.86

A cognitive comparison helps L2 learners develop their IL system. For a cognitive comparison to occur, a learner's own linguistic realization and its target form should have a resemblance (Boulouffé, 1986; Takatsuka, 2003). Table 5.13 indicates how a resemblance between learners' own linguistic realization and its target form promotes the incorporation of the latter.

Table 5.13

Contingency Table of Resemblance and Incorporation

	Successful/Unsuccessful incorporation		Total	
	(+)	(-)		
Resemblance	(+)	36	15	51
	(-)	28	53	81
Total	64	68	132	

The analysis has shown that the participants with high proficiency are more likely to use targetlike forms in Output 1 than the participants with low proficiency. Of the 51 cases where there was a resemblance between the two linguistic forms, the participants incorporated the target linguistic forms in 36 cases. On the other hand, of the 81 cases where there was not a resemblance, the participants incorporated the target

linguistic forms in only 28 cases. The results of statistical analysis show that the resemblance and the Successful/Unsuccessful incorporation are not independent, $\chi^2(1, N = 132) = 16.257, p = .000$. It can be concluded that the resemblance between learners' own linguistic realization and its target linguistic form encourages him or her to incorporate the latter.

The last finding shows how noticing is important in L2 learning. Although a debate on whether noticing is indispensable for learning or not remains, the results of Study 3 show clearly that noticing a form by learners facilitates the incorporation of linguistic forms. Table 5.14 indicates how noticing a form encourages the participants to incorporate the target grammatical forms.

Table 5.14

Contingency Table of Noticing a Form and Incorporation

	Successful/Unsuccessful incorporation		Total	
	(+)	(-)		
Noticing a form	(+)	41	21	62
	(-)	23	47	70
Total		64	68	132

Of the 62 cases where noticing a form occurred, the participants incorporated the form in 41 cases. When noticing a form did not occur, however, the participants incorporated the form in only 23 out of 70 cases.

The results of statistical analysis show that noticing a form and the incorporation of the form are not independent, $\chi^2(1, N = 132) = 14.572, p = .000$. This result can be interpreted to support the Noticing Hypothesis.

5.4.6 Discussion

L2 learners come to be able to attend to details as their proficiency in the TL improves. While lexical

items are noticed easily because of their salience, grammatical forms are not so noticeable because of their complexity. Grammatical forms were employed as the target linguistic forms in this study because they are difficult for learners with low proficiency to notice. Though learners with high proficiency were expected to notice more grammatical forms, the noticing scores of the three levels are not significantly different from each other. Although the descriptive statistics seem to suggest that the participants with high proficiency notice more grammatical forms than the participants with low proficiency, it cannot be concluded that proficiency in the TL is the primary factor which influences learners' noticing.

It should be noted here that there are other learner factors which have a potential impact on noticing than proficiency in the TL. This remains to be clarified by further research.

In this study, the Upper group participants incorporated more linguistic forms, which accords with Iwanaka and Takatsuka (2006, 2007). A noticed form is processed by learners and gets incorporated into L2 learners' IL system if they think it necessary to do so. For learners to process a noticed part, they have to depend on their currently held linguistic knowledge (see Figure 3.2 in 3.1.3). How much linguistic knowledge they have is a crucial determinant which affects the success of the process in which noticed input, or "apperceived input" in Gass's (1988) term, is converted into comprehended input (see Figure 1.1 in 1.1).

Typical written comments by the Upper group participants are: "I should have used past perfect tense," and "*Of* needs to be used with *remind*." In these cases, the incorporation of target grammatical forms was promoted. Explicit explanation on linguistic forms provided after a meaning-oriented activity helps learners develop their IL system efficiently (Muranoi, 2000a). The Upper group participants went through the same process as this by analyzing a noticed part syntactically with their ample linguistic knowledge, which led them to incorporate more grammatical forms than the participants of other groups.

Typical written comments by the Lower group participants are: "I have never seen such an expression as this" and "I might have learned this expression before." These comments suggest that the participants did not deepen their understanding of the noticed parts. In these cases, the incorporation of

grammatical forms was not facilitated.

As Table 5.13 shows, the resemblance between a learner's own linguistic realization and its target counterpart is also an important determinant which affects the incorporation of the latter. As discussed in 4.2.4, the format used for encoding an intended meaning remains active in memory. When a learner's own linguistic realization and its target counterpart have a resemblance, the format remaining in memory can be activated again and utilized for analyzing the target counterpart in relevant input. This means that the mental effort made at Stage 2 is utilized again in looking at the target counterpart.

The resemblance between learners' linguistic realization and its target counterpart triggers a cognitive comparison, which brings about the incorporation of the latter. When learners' output and its target counterpart do not bear a resemblance, the format which was used to encode the former is not utilized to process the latter. This means that the heightened sense of problematicity which learners have during output is not utilized for processing relevant input. This explains why the participants incorporated fewer grammatical forms when their own linguistic realization and its target form in the relevant input did not have a resemblance.

Table 5.14 suggests that noticing is a facilitative factor in L2 learning. Although there are some researchers who still doubt the necessity of noticing in L2 learning as discussed in Chapter 3, the results of Study 3 clearly show that learners incorporate more grammatical forms when they notice a form than when they do not. Although what this study has clarified may be limited in its scope, it can be concluded that providing learners with opportunities to process relevant input after producing output in class is recommendable to bring about efficient IL development.

5.4.7 Conclusion

The findings of this study are: (1) Learners with high proficiency incorporate more grammatical forms than learners with low proficiency through the output-input activity, (2) The resemblance between a learner's own linguistic realization and its target form in relevant input promotes the incorporation of the

latter and (3) Noticing a form facilitates the incorporation of the form.

Although what this study has clarified is informative, there are several drawbacks which should be reexamined by further research. As the participants' knowledge on the target grammatical forms was not measured in advance, it is not clear how much knowledge they had on the target grammatical forms when they took part in the experiment. It should be admitted that the mean incorporation scores in Table 5.12 reflect both (1) and (2).

- (1) The participants deepened their understanding on the target grammatical forms through the output-input activity and incorporated them.
- (2) The participants' prior knowledge on the target grammatical forms was activated through the output-input activity and they were able to use them correctly in Output 2. That is, they already knew the target grammatical forms when they took part in the experiment.

The second drawback to be considered is that this research may have had such a problem as "researcher expectancy" (Beck & Ebank, 1991). That all the participants took the author's class regularly might have some impact on the results of this study. Though the author was very careful not to influence learner performance along the lines of his predictions for the experiment, it remains possible that the expectancy effect had some influence on the data.

Although these drawbacks need to be solved by further research, the results of Study 3 suggest that producing output and noticing triggered by producing output encourage Japanese learners of English to incorporate grammatical forms. The participants' erroneous expressions in Output 1 were corrected in Output 2. Exposure to relevant input immediately after producing output provides learners with an opportunity to contrast their own linguistic realization with its target counterpart. This opportunity, if the two expressions have a resemblance, trigger learners to reactivate the format which was employed to encode their own linguistic realization and thus results in the incorporation of more linguistic forms.

5.5 Summary

This chapter reviewed the three experimental studies which had been conducted to clarify the effects of producing output and noticing triggered by producing output on L2 learning. Although each study has some drawbacks which should be reexamined by further research, the results of the three studies basically show that L2 learners incorporate linguistic forms into their IL system through the output-input activity.

The results of the three experimental studies clearly show that both producing output and noticing triggered by producing output have important roles to play in L2 learning.

Chapter 6

Discussion

The previous chapter reviewed the three experimental studies which had been conducted to investigate influences of producing output and noticing triggered by producing output on the immediate incorporation of linguistic forms. This chapter will survey the results of the three experimental studies by answering the six research questions formulated in Chapter 4.

Although they were motivated by different objectives, the three studies which were reviewed in Chapter 5 share the same purpose of clarifying impact of producing output and noticing triggered by producing output on second language (L2) learning. In all the three studies, the participants were exposed to relevant input immediately after producing output. This procedure was termed the output-input activity. Table 6.1 shows the design features of the three studies.

Table 6.1

Design Features of Three Studies

	<i>N</i> of participants	Output task	Target linguistic forms
Study 1	39	translation	new lexical items familiar forms with new meanings
Study 2	29	guided-composition	no target linguistic forms
Study 3	38	dicto-comp	grammatical forms

As discussed in the previous chapter, the participants were not English majors and did not have opportunities to use English in their daily lives. As it was likely that verbalizing and writing down what they have noticed in English might result in less precise reports because of the difficulty of using the target

language (TL), they wrote down what they had noticed in their first language (L1), or Japanese.

The three studies which were conducted have brought about several pedagogically informative results. Major results of the three studies are summarized below:

- (1) Although the output-input activity rarely encourages learners to incorporate completely new lexical items, it provides learners with opportunities to process input with their currently held linguistic knowledge and leads them to incorporate grammatical forms, grammatical collocations and lexical collocations.
- (2) Noticing a hole triggered by output prompts the incorporation of linguistic forms to fill the hole.
- (3) Noticing a form in relevant input prompts the incorporation of the noticed linguistic form.
- (4) The output-input activity leads learners with high proficiency to incorporate more linguistic forms than learners with low proficiency.
- (5) The incorporation of target linguistic forms is promoted when: i) Learners analyze a form in relevant input syntactically, ii) Learners perceive a form in relevant input as being in contrast with its counterpart in their own output and realize ungrammatical or less appropriate status of the latter and/or iii) Learners' own linguistic realization bears a resemblance to its target counterpart.

6.1 Discussion

6.1.1 Incorporated Linguistic Forms

The first research question was: What aspects of language are likely to be incorporated through the output-input activity? Producing output is thought to lead L2 learners to move from a semantic mode to a syntactic mode because it requires them to encode an intended meaning without external cues. During output, learners' sensitivity toward how a certain lexical item should be used in a sentence is heightened. The residual activation of the syntactic information stored in each lexical item is reinforced when they are exposed to relevant input after producing output. Thus the following hypothesis was formulated: Learners

incorporate grammatical forms, grammatical collocations and lexical collocations through the output-input activity.

As Table 6.1 shows, different target linguistic forms were employed in each study. In Study 1, new lexical items and familiar forms with new meanings were employed as the targets. The new lexical items employed as the targets were: *Abate*, *ransack*, *mutilate* and *elucidate*. They were quite salient and most participants noticed them in looking at the relevant input. Both in production and comprehension, lexical items draw learners' attention first. In the posttest, however, they incorporated none of them. Studies 2 and 3 produced the same result. The participants did not incorporate the new lexical items which they had noticed in looking at the relevant input.

In learning a lexical item, what most learners do first is to establish the form-meaning relationship. Japanese learners of English are likely to learn collocations and grammatical functions of a lexical item after learning its meaning and spelling (Nakamura, 2002). It is considered that L2 learners feel uneasy if they do not know what a lexical item means in their L1 (Kernerman, 1997). For many L2 learners, lexical items whose meaning they do not know are more salient than other linguistic forms. Concerning why the participants incorporated none of them in spite of their salience, Nation (2001) has pointed out that the number of exposure to target lexical items is an influential factor in vocabulary learning. In a similar vein, Kachroo (1962) has argued that L2 learners need to be exposed to new lexical items seven times or more than that before learning them. Crothers and Suppes (1967) have argued that the number may be around six times or seven times. Tinkham (1993) has also argued that the number may be between five times and seven times. Although the number varies among different individuals, it is clear that L2 learners need to be exposed to new lexical items several times before learning them. Being exposed to the relevant input once was not good enough for the participants to incorporate the lexical items which they had looked at for the first time.

It seems that the locus of the output-input activity does not lie in learning new lexical items. How does the output-input activity contribute to L2 learning? The results of the three studies suggest that the

output-input activity helps L2 learners improve their command of the TL in two ways.

First, the output-input activity helps L2 learners gain control of grammatical forms of which they have not gained a good command. In Study 3, four grammatical forms were employed as the target linguistic forms. They were: The hypothetical past perfective, the relative pronoun, the inanimate subject and the comparison. They were less salient than new lexical items and some participants noticed none of them in looking at the relevant input. When they noticed the grammatical forms, however, the participants incorporated approximately 60% of the noticed forms in the posttest.

It is not probable that the participants did not have any partial knowledge on the four grammatical forms because they are taught at a high school. It is difficult, however, for many Japanese learners of English to use them correctly because they require complicated manipulation. This explains why the participants' Output 1 contained errors in spite of their familiarity with the four grammatical forms. For example, a Middle group participant's Output 1 was *I wish you were there with us then*. In looking at the relevant input, he noticed that his linguistic realization was erroneous. His Output 2 in the following week was *I wish you had been there with us then*. Similar examples were abundant. The participants' errors in Output 1 were corrected in their Output 2.

As discussed in 3.5.2, L2 learners do not learn linguistic forms as one. According to Skehan (2002), there are four SLA processing stages: Noticing, patterning, controlling and lexicalizing. The third stage, or controlling, consists of three substages: Becoming accurate, creating a repertoire and achieving fluency. Through the output-input activity, L2 learners can move to the next stage of the SLA processing stages. The results of Study 3 indicate that the output-input activity led the participants to be more accurate in using the four grammatical forms in question.

Second, the output-input activity helps L2 learners establish a new associative connection, which consists of three categories: Establishing a new connection between two dominant linguistic forms, establishing a new connection between a form and its meaning and establishing a new connection between a dominant linguistic form and a preposition or a grammatical structure.

The typical example of the first category is a lexical collocation. Lexical collocations are recurrent, semi-fixed combinations and consist of nouns, adjectives, verbs and adverbs (Benson, Benson, & Ilson, 1997). Lexical collocations, though they are important in achieving nativeness of the TL, are difficult for many L2 learners to learn. Concerning this issue, Granger (1998) has pointed out that "...learners are using collocations, but that they underuse native-like collocations and use atypical word-combinations" (p.152). Compared with grammatical collocations which will be discussed later, lexical collocations are considered to be more difficult to deal with because they do not accept rule-based explanation. Take the expression *warmest regards* as an example. Nobody can explain why the words such as *hottest* and *hearty* cannot collocate with *regards*.

In Study 1, four lexical collocations were employed as the target linguistic forms. The lexical collocations employed in Study 1 were quite noticeable for the participants. The detailed analysis of the participants' written reports and the interviews with them showed that there were quite a few cases where they knew both constituents of a lexical collocation but did not know that they could collocate with each other. The expression *work part-time* serves as a typical example. Although both constituents were familiar to the participants, none of them used the expression *work part-time* in Output 1. The most preferred linguistic realization in Output 1 was *have a part-time job*. In looking at the relevant input, they noticed that the requested meaning could be realized linguistically by combining two lexical items which were familiar to them. Some of them were able to use the expression *work part-time* in Output 2.

In Study 1, four lexical items whose forms are familiar to the participants were also employed as the target linguistic forms. They serve as examples of the second category, or establishing a new connection between a form and its meaning. Take the lexical item *chemistry* as an example. Although many L2 learners know that the lexical item refers to the science dealing with the composition and properties of substances, few of them know that it also refers to a good relationship between two people.

During the interview session, some participants said that it was impressive to notice that a lexical item which they had already known could be used to convey the requested meaning. Some participants

used the lexical item *chemistry* in Output 2 although none of them used it in Output 1. It is possible to say that the participants mapped already learned forms with their new meanings through the output-input activity.

The typical example of the third category, or establishing a new connection between a dominant linguistic form and a preposition or a grammatical structure, is a grammatical collocation. A grammatical collocation is a phrase which consists of a dominant word (a noun, an adjective and a verb) and a preposition or a grammatical structure such as an infinitive or clause. Although many learners' dictionaries refer to grammatical collocations in detail, Japanese learners of English have difficulty in using them correctly.

To elucidate what aspects of language are likely to draw learners' attention, no target linguistic forms were preselected in Study 2. Three investigators analyzed what aspects of language the participants had incorporated by analyzing their Output 2. The conclusion to be drawn is that they noticed prepositions and grammatical structures which were used with dominant words and incorporated them through the output-input activity. Their comments on noticed forms include "*Between* needs to be used with *is located*," "*Into* is necessary after *converted*" and "*Recommends* should be used with *to*." The comments show that they noticed the co-occurrence relation between a dominant word and a preposition.

Although the number was small, some participants wrote down how a certain lexical item could be used in a sentence. Typical examples are: "*Edo-Period* can be used as an adjective" and "*Serves* can have an inanimate thing as its subject." These comments show that they deepened their understanding of how a certain lexical item should be used in a sentence. Like lexical collocations and grammatical collocations, it is also part of syntactic information of lexical items. It can be concluded that the output-input activity is likely to lead L2 learners to incorporate syntactic information of lexical items.

The goal of L2 learning research is to achieve a better understanding of what aspects of language are incorporated through certain activities. The results of the three studies show that the output-input activity encourages L2 learners to achieve accuracy in using grammatical forms, map already learned

forms with their new meanings and gain syntactic information of lexical items. This is how the output-input activity contributes to L2 learning.

6.1.2 Noticing and Incorporation of Linguistic Forms

The second research question was: Do noticing a hole triggered by output and noticing a relevant form in input presented immediately after output encourage learners to incorporate linguistic forms into their interlanguage (IL) system? It formulated the following hypothesis: Learners incorporate more linguistic forms into their IL system when they notice a hole and/or when they notice a form in input. Although they are closely related to each other, the noticing-a-hole-issue and the noticing-a-form-issue will be discussed independently to show how each of them contributes to the incorporation of linguistic forms.

Noticing a hole, or experiencing difficulty in encoding an intended message, makes learners more sensitive to a linguistic form which is necessary to fill the hole. As a result, learners are motivated to incorporate linguistic forms into their IL system. Study 1 dealt with the noticing-a-hole-issue. Let us look at Table 5.3 again.

Table 5.3

Contingency Table of Noticing a Hole and Incorporation

		Incorporation		Total
		(+)	(-)	
Noticing a hole	(+)	101	94	195
	(-)	23	89	112
Total		124	183	307

The table shows how noticing a hole brings about the incorporation of linguistic forms. The results of statistical analysis show that noticing a hole and the incorporation of linguistic forms are not independent,

$\chi^2 (1, N = 307) = 27.588, p = 0.000$. Noticing a hole during output primes learners for future input and makes them ready to search for a linguistic form to fill the hole.

The detailed analysis of the participants' written comments has revealed that the Upper group participants are more likely to think about language during output. They think about grammar and usage of lexical items. On the other hand, the Lower group participants are more likely to search for a suitable lexical item to encode a concept. It seems that most of their cognitive effort is spent on retrieving lexical items. As a result, they are not engaged in grammatical encoding.

As Table 5.3 shows, there are 94 cases where noticing a hole has not resulted in the incorporation of linguistic forms. In 68 cases of them, the participants underlined a part in the Japanese sentence and wrote down that they did not know the exact lexical item to encode it. Their comments clearly suggest that they noticed a hole during output. What should be noted here is that searching for a lexical item is less likely to result in the incorporation of linguistic forms. This is probably because searching for a lexical item to realize a certain concept linguistically does not lead learners to move to a syntactic mode. It is necessary here to understand how a sentence can be generated. Iwanaka (2007), referring to Kozlowsky, McCoy and Vijay-Shanker (2003), explains the sentence generation process as follows:

Sentence generation typically starts with a syntactic head and it is generally realized by a verb.

The selected verb sets up a syntactic context into which other components are fit (p.15).

Once a syntactic head is chosen, the lemma information of the selected lexical item is accessed and activated (see 7.1.1.2 for detailed discussion). The selected lexical item's syntactic category and conceptual arguments are stored as lemma. This activation, Levelt (1989) considers, leads to certain syntactic building procedures. What should be noted here is that learners cannot move to a syntactic mode until a syntactic head of the intended message is chosen. If learners are struggling with the production of one-word utterances, they cannot proceed to the next step. They use all their attentional resources to

retrieve a lexical item and cannot think about how a lexical item should be used.

While producing output, it seems that L2 learners notice a hole at two levels: Noticing a hole at the level of searching for a syntactic head and noticing a hole at the level of searching for the lemma information of a selected syntactic head. While the latter leads learners to move to a syntactic mode and is more likely to result in the incorporation of linguistic forms, the former prevents learners from thinking about the language they are producing and is less effective in bringing about the incorporation of linguistic forms. The former is called the first level noticing a hole and the latter is called the second level noticing a hole.

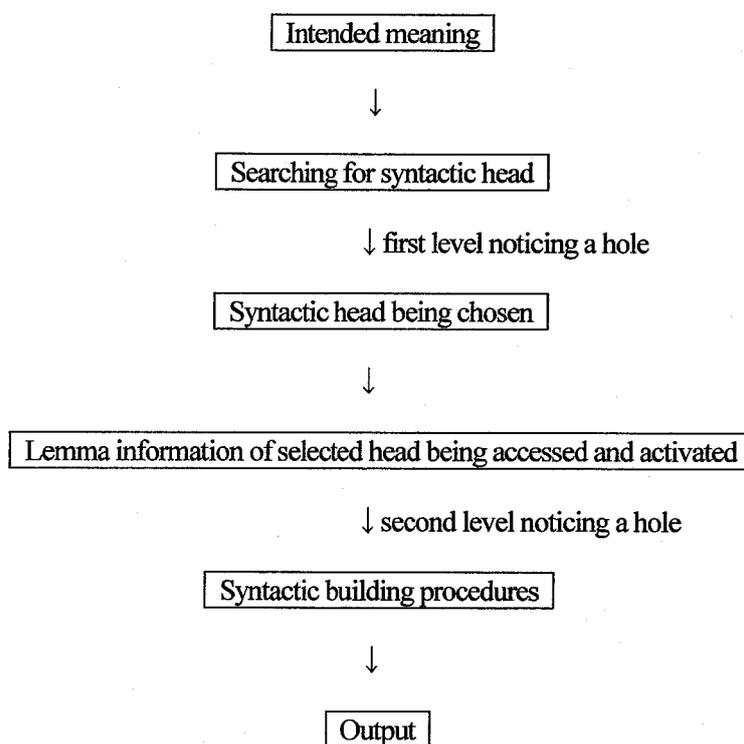


Figure 6.1 A process of sentence generation

Although it is difficult to elucidate L2 learners' noticing a hole clearly and further research is still needed to clarify learners' cognitive activities during output, the results of the present study suggest that noticing a hole during output encourages the incorporation of linguistic forms. The conclusion to be drawn is that

noticing a hole leaves a trace in learners' memory, which in turn prompts them to search for a relevant linguistic form to fill the hole.

Studies 1 and 3 dealt with the noticing-a-form-issue. It is generally accepted that L2 learning is largely driven by what learners pay attention to and notice in TL input and what they understand the significance of the noticed input to be. As discussed in Chapter 4, noticing a form is considered to facilitate the incorporation of the noticed form. Let us look at Tables 5.4 and 5.14 again. As the tables show, noticing a form and the incorporation of the form are not independent.

Table 5.4

Contingency Table of Noticing a Form and Incorporation

	Incorporation		Total	
	(+)	(-)		
Noticing a form	(+)	100	78	178
	(-)	26	103	129
Total	126	181	307	

$$\chi^2(1, N=307) = 38.639, p = .000$$

Table 5.14

Contingency Table of Noticing a Form and Incorporation

	Successful/Unsuccessful incorporation		Total	
	(+)	(-)		
Noticing a form	(+)	41	21	62
	(-)	23	47	70
Total	64	68	132	

$$\chi^2(1, N=132) = 14.572, p = .000$$

The participants incorporated more linguistic forms when they noticed a form than when they did not. Although some researchers such as Schachter (1998) and Truscott (1998) have skeptical views on the positive roles of noticing to play in L2 learning, the results seem to argue for the facilitative function of noticing in L2 learning. As the tables show, there are 49 cases where the participants incorporated target linguistic forms without noticing in total. Although logical explanation is required, the author has only limited information and can only guess why they incorporated target linguistic forms without noticing. There can be two possible reasons. One is that the participants did not write down what they had actually noticed. In the studies, the participants were asked to underline a certain part which they thought to be important and write down what they had noticed in looking at the part. It is possible that the participants' noticing a form was underestimated. This should be improved by further research. In the studies, the author tried not to overestimate the roles of noticing a form in L2 learning. It should be stressed here that the results shown in Tables 5.4 and 5.14 are rather moderate and that even the moderate results argue for positive roles of noticing a form in L2 learning.

The other reason is that the operationalization of noticing a form was not delicate enough to evaluate the amount of attentional resources the participants paid to a form precisely. The basic assumption of the present study is that more attention is likely to result in more learning. That noticing a form occurred means that more attention was paid to the form. Although the operationalization of noticing a form was slightly different between the two studies, the three investigators basically judged that noticing a form occurred when the participants underlined a part and: (1) Mapped the part with its appropriate meaning, (2) Mentioned that they did not know the expression and/or (3) Mentioned the part metalinguistically.

In the two studies, there were several cases where some participants wrote down long comments on a form and incorporated it successfully in the posttest. As some of their long comments did not agree to the operationalization, the three investigators judged that noticing a form did not occur. They did not take the length of written comments into consideration in deciding whether noticing a form occurred or not. It

is possible to argue, however, that the long comments indicate that the participants paid close attention to a form and processed it deeply enough to bring about the incorporation. When they wrote down long comments on a form, they might have been engaged in various cognitive activities, which might have left a deep trace in their memory enough to bring about the incorporation of the linguistic form.

Operationalization of noticing a form is an issue of great interest and importance and has to be made more elaborate and definite by further research. It should be admitted, however, that there can be no absolute operationalization of noticing a form which is elaborate enough to exclude a gray area between noticing a form and not noticing a form.

One may argue that the participants detected a form and the detected form got incorporated. As discussed in 3.1.2, detecting a part, or detection, does not require subjective awareness. Tomlin and Villa (1994) have argued that detection, not noticing, is crucial for learning. There is very little chance, however, that the detected form got incorporated. When the participants incorporated a form, they never failed to underline the incorporated form. That is, they never incorporated a form without underlining it. Underlining a form qualifies as evidence that they at least paid attention to the form. The argument that detection brought about the incorporation of linguistic forms is inaccurate.

There were quite a few cases where noticing a form did not result in the incorporation of the form. Learning is a process of gradual change of learners' knowledge system and the system does not change all at once. In the two studies, the participants were provided with the target linguistic forms only once. It is not surprising at all that the participants did not incorporate the target linguistic forms in spite of their noticing. Another factor to be considered is cognitive activities triggered by noticing. The participants' written comments show that noticing triggers a variety of cognitive activities. Each seems to have a different impact on the incorporation of linguistic forms. A full report of this issue will be made in 6.1.6.

6.1.3 Learners' Proficiency and Noticing a Form

The third research question was: How do learners' proficiency levels influence their noticing forms. As it

is considered that learners with higher proficiency have more attentional resources which they can spare freely, the following hypothesis was formulated: Learners with high proficiency notice more forms in input than learners with low proficiency. In Studies 2 and 3, this hypothesis was tested.

In Study 2, target linguistic forms were not chosen in advance. The participants underlined the parts which they thought were important and wrote down what they had noticed in looking at the relevant input. Although the descriptive statistics show that the Lower group participants noticed less forms than the Middle group and the Upper group participants (see Table 5.7 in 5.3.4.4), the difference was not statistically significant, $F(2, 26) = 3.122, p = .061$.

In Study 3, four grammatical forms were chosen as target linguistic forms: The hypothetical past perfective, the relative pronoun, the inanimate subject and the comparison. It is assumed that noticing grammatical forms requires L2 learners to allocate their attentional resources to linguistic units which are bigger than lexical items. Because of their limited linguistic resources, learners with low proficiency are likely to pay their attentional resources to lexical items. This is why it is difficult for them to notice such linguistic forms as collocations and grammatical forms. The Upper group participants were expected to notice more grammatical forms than the Middle group and the Lower group participants. Although the descriptive statistics supported this prediction (see Table 5.11 in 5.4.5), the noticing scores of the three groups were not significantly different from each other, $F(2, 35) = 2.619, p = .087$.

Although these results suggest that proficiency in the TL is an influential determinant of noticing a form, it should be noted that there can be other important factors which influence learners' noticing. One possible candidate is learners' working memory. An important role has been ascribed to working memory during L2 learning (N. Ellis & Schmidt, 1997; Miyake & Friedman, 1998).

Research in L2 learning seems to suggest that individual differences in working memory account for some differences in L2 performance and acquisition. N. Ellis and Sinclair (1996), based on their study comparing the effects of learners' phonological rehearsal on such elements as comprehension, metalinguistic knowledge and acquisition, have concluded that individual differences in working memory

can have profound effects on L2 learning.

The results of Studies 2 and 3 and the important roles ascribed to learners' working memory in L2 learning seem to suggest that the proficiency in the TL alone is not enough to account for learners' noticing. Further research is required to investigate the impacts of both individual learners' TL proficiency and individual differences in working memory on noticing. They seem to have multiple effects on noticing. It is also possible that there are other factors which influence L2 learners' noticing a form in input.

6.1.4 Learners' Proficiency and Incorporation of Linguistic Forms

The fourth research question was: How do learners' proficiency levels influence the incorporation of linguistic forms? Learning involves integration of new knowledge with prior knowledge. As Boulouffe (1986) states, learners need to find support in anchors provided by previous knowledge. Thus, prior knowledge is one of the factors which determine whether noticed input becomes meaningful or not. Prior knowledge decides what level of understanding takes place. The more knowledge an individual learner has, the more elaborate his or her processing is. The extent to which a learner processes noticed forms would to a great extent depends on his or her prior knowledge on the TL. The success of the processing of noticed forms is highly dependent on the amount of knowledge an individual learner has on the TL (Lindsay & Norman, 1977). Thus, the following hypothesis was formulated: Learners with high proficiency incorporate more linguistic forms into their IL system than learners with low proficiency through the output-input activity. This hypothesis was tested in all the three studies and Studies 2 and 3 confirmed the hypothesis partially.

Although the descriptive statistics of Study 1 showed that the Upper group participants incorporated more linguistic forms than the participants of the other groups, the difference was not statistically significant (see Table 5.5 in 5.2.5.5). Here the discussion will be limited to the results of Studies 2 and 3. Let us look at Tables 5.8 and 5.12 again.

Table 5.8

Mean Incorporation Scores of Participants With Different Levels

Group	<i>N</i>	<i>M</i>	<i>SD</i>
Lower group	10	2.10	0.99
Middle group	10	3.10	1.91
Upper group	9	4.44	2.46
Total	29	3.17	2.04

$$F(2, 26) = 3.771, p = .036$$

Table 5.12

Mean Incorporation Scores of Participants With Different Levels

Group	<i>N</i>	<i>M</i>	<i>SD</i>
Lower group	13	0.81	0.80
Middle group	13	1.23	0.93
Upper group	12	1.71	0.62
Total	38	1.24	0.86

$$F(2, 35) = 3.972, p = .028$$

Both in Studies 2 and 3, Bonferroni's multiple comparison has shown that the effect of learners' proficiency is statistically significant between the Upper group participants and the Lower group participants at an alpha level of .05. When the participants were exposed to the relevant input, they were not allowed to consult a dictionary. The only resource available in looking at the relevant input was their currently held knowledge on the TL.

When L2 learners notice a form, they then process the noticed form for comprehension. If they are not allowed to consult a dictionary, they have to depend on their current knowledge. It should be noted

that their currently held knowledge functions as scaffolding when they process the noticed form for comprehension. The more prior knowledge they have, the more elaborate and multifaceted their processing of the noticed form is likely to be. Processing of noticed forms is considered to occur at various levels. While preliminary stages are concerned with superficial features, such as physical aspects of noticed forms, later stages are more concerned with matching them against the already stored knowledge base (Izumi, 2002). Similarly, Osborne and Wittrock (1983), in a paper dealing with science learning, claims “the stored memories and information processing strategies of the brain interact with the sensory information received from the environment to actively select and attend to the information and to actively construct meaning” (p.494).

Whether L2 learners can analyze input data at deeper levels or not depends on the amount of their already stored knowledge. It is considered that an analysis at deeper levels leads to more elaborate, longer lasting and stronger traces in memory. Hulstijn (2001, 2003) has also argued that grammar and vocabulary learning takes place when L2 learners process a linguistic form in question deeply, which indicates the importance of learners’ involvement with input materials.

To conclude, the Upper group participants had more prior knowledge on the TL which made it possible for them to process the relevant forms in input at a deeper level. The processing at a deeper level left a strong and long-lasting trace in their memory. This explains why learners with high proficiency are likely to incorporate more linguistic forms than learners with low proficiency through the output-input activity.

6.1.5 Resemblance and Incorporation of Linguistic Forms

The fifth research question was: Do learners incorporate more linguistic forms into their IL system if their own linguistic realization bears a resemblance to its counterpart in relevant input presented immediately after output? It is generally agreed that a cognitive comparison is assumed to play crucial roles in L2 learning (see 4.2.3 for further details).

For a cognitive comparison to occur, it is necessary for learners to notice that their own linguistic realization and the relevant form in input provided after output are referring to the same event and fulfilling the same function. It follows that learners' linguistic realization and the relevant form should have a resemblance. Thus the following hypothesis was formulated: Learners incorporate more linguistic forms into their IL system when their own linguistic realization bears a resemblance to its counterpart in input than when it does not bear a resemblance. This hypothesis was tested in Study 3. Let us look at Table 5.13 again.

Table 5.13

Contingency Table of Resemblance and Incorporation

	Successful/Unsuccessful incorporation		Total	
	(+)	(-)		
Resemblance	(+)	36	15	51
	(-)	28	53	81
Total	64	68	132	

$$\chi^2 (1, N=132) = 16.257, p = .000$$

As the table shows, learners incorporate more linguistic forms when their own linguistic realization bears a resemblance to its target form in input than when it does not. To produce output, learners make access to the lemma information of a selected syntactic head and build a sentence. When they are engaged in the process, they think about what lexical item they have to use and in what patterns they have to use it. Even after producing output, the syntactic information of the selected lexical item remains active, which Kim and McDonough (2008) state as “the residual activation of the morpho-syntactic information stored with individual lexical items” (p.149). If the same syntactic head is used in the input provided after producing output, that is, learners' own output bears a resemblance to its target, the same syntactic information gets

retrieved and the residual activation in learners' memory is reinforced.

If there is not a resemblance between learners' output and its target in input, on the other hand, the residual activation in their memory is not reinforced. Even if they notice a relevant form in input, the mental effort which they made during output is utilized only partially. There seem to be two levels of noticing a form: Noticing a form based on the mental effort caused by producing output and noticing a form independent of the mental effort caused by producing output. The former will be called the internally primed noticing a form and the latter will be called the externally primed noticing a form. As shown in Figure 6.2, which noticing a form occurs depends on whether learners' linguistic realization bears a resemblance to its counterpart in input or not.

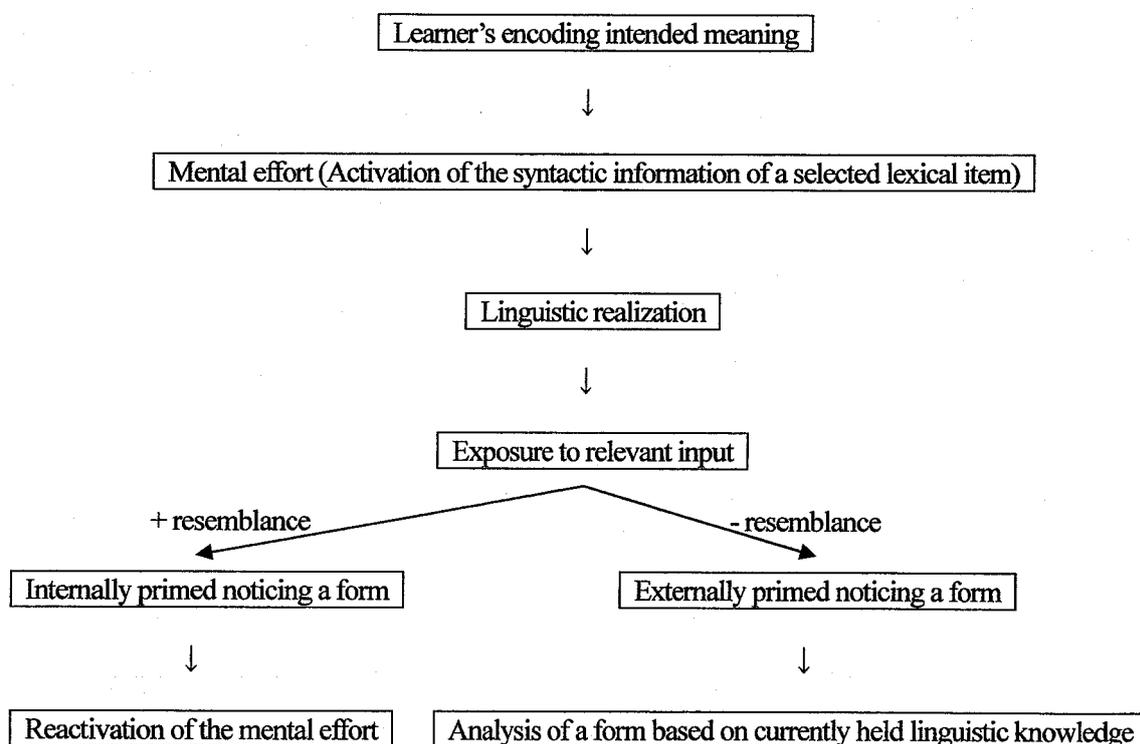


Figure 6.2 Internally primed noticing a form and externally primed noticing a form

The figure shows that producing output is indispensable to provoke internally primed noticing a form. Externally primed noticing a form, on the other hand, can be provoked by activities which do not require

learners to produce output.

While externally primed noticing a form brings about the analysis of a form with their currently held linguistic knowledge alone, internally primed noticing a form brings about both the reactivation of the mental effort which learners were engaged in during output and the analysis of a form with their current linguistic knowledge.

When learners' linguistic realization does not bear a resemblance to its counterpart in input, they do not have an opportunity to utilize the mental effort which they were involved in during output. Being exposed to relevant input after producing output, they attend to forms of their own interest and process them only with their currently held linguistic knowledge. This processing of forms does not require learner output and occurs in such activities as Input Enhancement and Input Processing.

The opportunity to utilize the mental effort which learners are involved in during output is brought about when learners' linguistic realization and its counterpart in relevant input bear a resemblance from each other. If the mental effort during output is activated again in exposure to relevant input after producing output, a deep trace is left in learners' memory. The resemblance between the two expressions is a prerequisite for the reactivation of learners' mental effort during output, which is more likely to result in the incorporation of linguistic forms than the processing of forms without producing output.

6.1.6 Cognitive Activities and Incorporation of Linguistic Forms

The sixth research question was: What cognitive activities evoked by output and noticing encourage learners to incorporate linguistic forms? One important factor that determines whether learners incorporate a linguistic form is the level of analysis of the form that they achieve. Being exposed to relevant input after producing output, learners analyze it with their already stored knowledge base. An analysis at a deeper level is likely to result in more elaborate, longer-lasting and stronger traces. Robinson (1995) has argued that learning outcomes are determined by the level of activation of information in short-term memory, which is caused by rehearsal and elaboration.

A close analysis of the participants' noticing reports put them into three categories: (1) New finding, (2) Form-meaning matching and (3) Syntactic analysis. The typical examples of the first category include: "I did not know this expression" and "I have never seen this expression before." The noticing reports which map lexical items with their Japanese counterparts belong to the second category. The third category includes such comments as "*Serves* can have an inanimate thing as its subject" and "*Into* is necessary after *converted*." The reports belonging to the third category indicate that the participants focused their attention on how linguistic forms are related to each other.

It is claimed that an analysis at the level of meaning is not as useful for incorporation as an analysis made at the level of syntax (Izumi, 2003). Thus the following hypothesis was formulated: A syntactic analysis of a noticed part results in the incorporation of more linguistic forms. This hypothesis was tested in Study 2. Let us look at Table 5.9 again, which indicates how a syntactic analysis of a form promotes the incorporation of it.

Table 5.9

Contingency Table of Syntactic Analysis and Incorporation

		Incorporation		Total
		(+)	(-)	
Syntactic Analysis	(+)	74	98	172
	(-)	19	151	170
Total		93	249	342

$$\chi^2 (1, N = 342) = 43.798, p = .000$$

According to the Output Hypothesis (see 2.4 for further details), producing output makes learners move from semantic processing which is prevailing in comprehension to syntactic processing. While comprehension allows learners to depend on external information such as general knowledge, producing

output requires them to pay more close attention to language itself. They are required to think about collocations and grammatical functions of a linguistic form during output.

Although the results of the statistical analysis show that a syntactic analysis of a form and the incorporation of the form are not independent, there are as many as 98 cases where a syntactic analysis did not result in the incorporation. It is necessary to investigate the cause of this. The primary cause is that the participants were exposed to the relevant input only once. It is self-evident that the number of exposure to target linguistic forms influences the incorporation of them. Thus it is not surprising that the participants failed to incorporate a form in spite of their syntactic analysis. It should rather be interpreted that a syntactic analysis of a form made the participants incorporate the form in as many as 74 cases after exposure to the relevant input only once.

There are 19 cases where the participants incorporated a form without a syntactic analysis. Although it was predicted that an analysis made at the level of syntax generally requires more attentional resources from learners than an analysis at the level of meaning, there can be cases where the latter makes learners pay enough attentional resources to a form to result in the incorporation of the form. The 19 cases should be interpreted as cases where the participants' analysis of a form was deep enough to result in the incorporation of it although it did not accompany a syntactic analysis.

6.2 Summary

This chapter tested the six hypotheses which were formulated in Chapter 4 by referring to the results of the three studies which had been conducted to clarify how output and noticing triggered by producing output contribute to L2 learning.

The results of the three studies show that L2 learners chiefly learn what they have noticed and what they have processed for comprehension. Producing output has a role of triggering the type of noticing which comprehension does not provoke. Both producing output and noticing have important roles to play in L2 learning. The results are summarized in Table 6.2.

Table 6.2

Summary of Results

Hypothesis	Prediction	Result
H1	Incorporated linguistic forms: Grammatical forms, grammatical collocations, lexical collocations	Supported
H2	Incorporation of linguistic forms: +noticing a hole > -noticing a hole	Supported
	Incorporation of linguistic forms: +noticing a form > -noticing a form	Supported
H3	Noticing of a form: Upper group > Middle group > Lower group	Not supported
H4	Incorporation of linguistic forms: Upper group > Middle group > Lower group	Partially Supported Upper group > Lower group
H5	Incorporation of linguistic forms: +resemblance > -resemblance	Supported
H6	Incorporation of linguistic forms: +syntactic analysis > -syntactic analysis	Supported

Chapter 7

Conclusion

This final chapter will review the previous six chapters briefly, explain the significance of the present study, make a proposal on how an output activity should be interwoven in class, discuss the limitations of the present study and suggest possible future studies.

Although VanPatten and Cadierno (1993a, 1993b) have argued that output practice plays no role in developing learners' interlanguage (IL) system, the present study assumes that output practice facilitates second language (L2) learning if it successfully affects cognitive processes such as noticing, hypothesis testing, metalinguistic reflection and syntactic processing. The objective of the present study is to clarify how producing output and noticing triggered by producing output contribute to IL development of Japanese learners of English. To achieve this objective, Chapter 2 gave the detailed discussion to output. After pointing out several drawbacks of Krashen's Input Hypothesis, the chapter explained Swain's Output Hypothesis and the process of language production by consulting Levelt's production model. Several empirical studies were also reviewed which investigated the causative effects of producing output on L2 learning. The chapter finally confirmed the importance of output in L2 learning.

Chapter 3 dealt with noticing. Attention, consciousness and noticing were first reviewed to elucidate the relationship between them and then the Noticing Hypothesis was reviewed. After reviewing the criticism against the hypothesis, the chapter confirmed the validity of the hypothesis. It was finally asserted that L2 learning is mainly driven by what learners pay attention to and notice in target language (TL) input. Chapter 4 presented a hypothetical way which shows how producing output and noticing triggered by producing output bring about desirable IL development. Then theoretical support for the output-input activity was offered. Finally, six research questions were offered, which in turn formulated six hypotheses. Chapter 5 made a report of the three experimental studies which had been conducted to

test the six hypotheses formulated in Chapter 4. Each study employed a different kind of output task and target linguistic forms.

Based on the results of the three studies, Chapter 6 answered the six research questions (see Table 6.2 for details). It is generally agreed that learning with subjective awareness has a major role to play when adult learners learn an L2 (Robinson, 2002; Skehan, 2002). The results of the three studies support this. It can be concluded that L2 learners learn what they have noticed and processed for comprehension.

7.1 Pedagogical Significance

This section will review the findings of the present study and discuss the significance of what it has clarified. The basic assumption of the present study is that IL development does not take place in a vacuum – it has to be stimulated by a concern, on the learner's part, for formal elements of language. If L2 learners are concerned with the form of the language which they are using, sensitivity toward a form is heightened during output and the relevant form in model input attracts their attention.

The output-input activity provides L2 learners with the following opportunities: (1) Paying close attention to language itself and (2) Making use of their currently held knowledge for production and for the processing of form in input for comprehension. It encourages learners to restructure their IL system actively and seems to be an activity suitable for learners with high proficiency. The three studies basically offered evidence to support this. The Upper group participants showed more learning than the Lower group participants through the output-input activity. There were quite a few cases where the Lower group participants were not able to process noticed forms because of their limited linguistic resources. No learning activity, including the output-input activity, can be a panacea for all L2 learners. In employing the output-input activity in class, teachers should take the proficiency level of their learners into consideration and choose an output task which encourages them to use less familiar expressions and encode meaning which their currently held linguistic knowledge is not enough to realize linguistically. If the above conditions are fulfilled, the output-input activity contributes to IL development in several ways.

7.1.1 Locus of the Output-Input Activity

The Output Hypothesis claims that producing output leads L2 learners to incorporate certain aspects of the TL which they cannot incorporate through comprehension. As discussed in 6.1.1, the output-input activity helps L2 learners improve their command of the TL in two ways. First, it helps L2 learners gain control of grammatical forms which they cannot use correctly. Second, it helps L2 learners establish a new associative connection.

The participants of the three studies incorporated grammatical forms, lexical collocations and grammatical collocations through the output-input activity. While the first is concerned with the rules of the TL, the latter two are concerned with how a lexical item should be used in a sentence. Although some linguists (for example, Barlow & Kemmer, 2000; Bybee & Hopper, 2001; Langacker, 2000) consider that there is not a sharp distinction between the rules and how a lexical item should be used in a sentence, each of them will be discussed separately for the sake of convenience.

7.1.1.1 Gaining Better Control of Grammatical Forms of the TL

In Study 3 (see 5.4 for details), four grammatical forms were employed as the target linguistic forms. The selected grammatical forms were: The hypothetical past perfective, the relative pronoun, the inanimate subject and the comparison. Although the participants were not majoring in English, the length of their English learning was at least almost seven years. As the four grammatical rules are taught at high school in Japan, it is not likely that the participants did not have any knowledge on them. Their comments on the relevant forms in input suggested that they had learned the forms before. Nevertheless, there were quite a few erroneous expressions in their Output 1. When they noticed the relevant forms in input, however, they incorporated approximately 60% successfully in the posttest. It was concluded that the output-input activity led the participants to be more accurate in using the four grammatical forms in question (Iwanaka, 2008b).

This section will discuss the issue in more detail and confirm the significance of the conclusion,

referring to Skill Acquisition Theory. It accounts for how people progress in learning a variety of skills from initial learning to advanced proficiency (DeKeyser, 2007b). Researchers have generally posited three stages of developments. For example, Anderson (1982, 1993) calls the three stages “declarative,” “procedural” and “automatic” and Byrne (1986) calls them “presentation,” “practice” and “production.” The nature of knowledge and its use are quite different between these three stages.

Initially, learners acquire a bit of knowledge on a skill without even trying to use it. Next, they act on this knowledge and turn it into a behavior. In more technical terms, this is the stage of turning declarative knowledge into procedural knowledge. Declarative knowledge followed by deliberate practice leads to increasingly robust knowledge. If the relevant declarative knowledge is available and drawn on to perform the target behavior, L2 learners can turn declarative knowledge into procedural knowledge after just a few trials (DeKeyser, 1997). For procedural knowledge to be automated, a large amount of practice is required. Practice leads to gradual automatization of knowledge.

It should be stressed here that proceduralization cannot get started if the right conditions for proceduralization are not present. The declarative knowledge which the task at hand requires is the first prerequisite. The second prerequisite is a situation which allows for use of that declarative knowledge. If the two prerequisites are fulfilled, L2 learners can turn declarative knowledge into procedural knowledge. In relation to this, Anderson, Fincham and Douglass (1997) show that the combination of abstract rules and concrete examples is necessary to get learners past the declarative threshold into proceduralization. Abstract rules and concrete examples can be regarded as components of declarative knowledge.

The output-input activity proposed in the present study is considered to set up a situation which allows for making use of declarative knowledge. Making access to declarative knowledge is a process of retrieving pieces of information from memory to assemble them and requires considerable time. When the participants were engaged in Output 1, they were allowed to make use of their currently held knowledge on the TL without time pressure.

The output-input activity also offers concrete examples by providing relevant input immediately

after output. To quote Schmidt (2001) again, learners are likely to notice “elements of the surface structure of utterances in the input – instances of language, rather than any abstract rules or principles of which such instances may be exemplars” (p.5) in input. It is impossible to tell how much knowledge the participants in Study 3 had on the rules of the target grammatical forms. To avoid offering an opportunity to learn the target grammatical forms before the experiment, the participants’ initial knowledge on them was not measured. Chances are that the participants with high proficiency were more likely to know the abstract rules of the target grammatical forms than the participants with low proficiency.

In spite of the fact that the four grammatical forms are taught at high school, the participants’ Output 1 had a lot of erroneous expressions. When they noticed a form in the relevant input, however, as mentioned before, they incorporated approximately 60% of the noticed forms and were able to use the grammatical forms in question accurately in the posttest. The general tendency was that the Upper group participants incorporated more linguistic forms than the Middle and Lower group participants. A plausible explanation is that the output-input activity served as an opportunity for the participants with the abstract rules of the grammatical forms in question to move from a declarative stage to a procedural stage. On the other hand, however, the activity did not serve as the opportunity for the participants without the rules. The difference is shown in Figure 7.1.

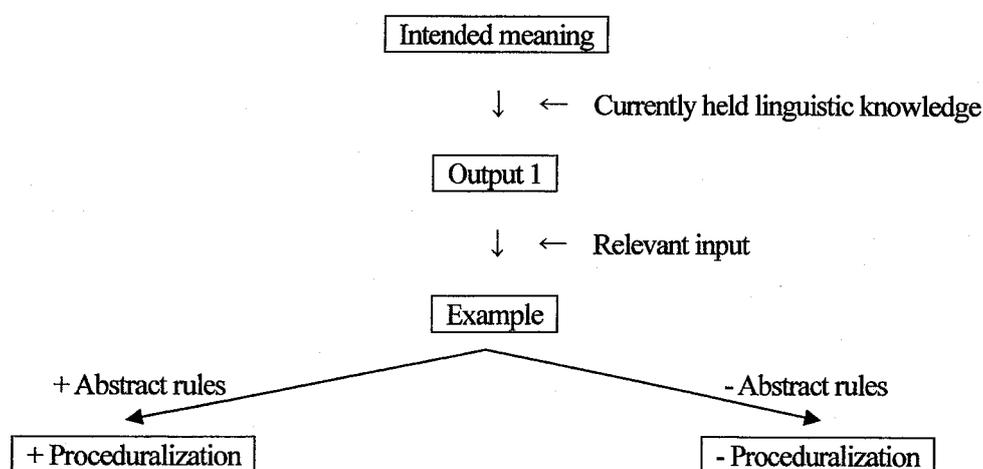


Figure 7.1 A process of proceduralization

As DeKeyser (2007b) has stated, “Automatization requires procedural knowledge. Proceduralization requires declarative knowledge and slow deliberate practice. The acquisition of declarative knowledge of a kind that can be proceduralized requires the judicious use of rules and examples” (p.107). What should be emphasized is these stages cannot be skipped or reversed. If this fact is ignored, L2 learners cannot develop the ability to use the TL. This explains why direct instruction of grammatical rules out of context has not been successful. Learning grammatical forms is a slow and gradual process of making the knowledge robust and fine-tuned.

Whether producing output is useful in L2 learning or not seems to be a fruitless debate. There is evidence that having learners produce language has an effect on L2 learning, and there is also evidence that it does not. What should be noted is that producing output plays little role in bringing about the qualitative change of learners’ IL system unless the output practice is slow and deliberate. In Izumi (2002), producing output contributed to learning because a text-reconstruction task was employed as an output task. In VanPatten and Cadierno (1993a, 1993b), on the other hand, producing output did not contribute to learning. The primary reason is that a drill was used as output practice. While a text-reconstruction task requires learners to pay attention to both meaning and form, a drill is rather a mechanical activity and does not require learners to think about language deliberately.

The output-input activity is considered to be “slow deliberate practice” which is likely to bring about the proceduralization of declarative knowledge. Many Japanese learners of English have difficulty moving from an initial state, where target forms are not known at all, to an end-state, where they have some command of the system of the TL and some capacity to use that system for production. The participants of the three studies are typical Japanese learners of English in that sense. The participants of the three studies reported in Chapter 5 are undergraduate students. Although they are not English majors, they have been studying English for more than six years. They had a substantial amount of knowledge on English. Most of them, however, were not able to use the four grammatical forms correctly. In the posttest, their performance was improved. That the participants were able to use the target grammatical forms in

the posttest can be regarded as an indication that the participants proceduralized their declarative knowledge.

7.1.1.2 Learning of Lemma Information

Through the output-input activity, the participants incorporated grammatical collocations and lexical collocations. Both are concerned with how a lexical item should be used in a sentence. This means that the output-input activity encourages L2 learners to acquire lemma information of a lexical item. A lexical item is a complex entity. Each lexical item has its semantic, syntactic, morphological and phonological information. The term *lemma information* (for short, lemma) is used to refer to a lexical item's semantic, syntactic and morphological information, that is, nonphonological information of a lexical item. People's lemma information is declarative knowledge, which is stored in their mental lexicon (Levett, 1989).

When people produce output, they retrieve a lexical item to match their intended meaning. They then access the lemma information of the retrieved lexical item. The lemma information tells them how the retrieved lexical item combines with other lexical items. The availability of the lemma information enables them to encode their intended meaning into a sentence. Once the appropriate lemmas have been selected, they are combined into a well-formed sentence. This process is known as grammatical encoding which constitutes one of the two components of the Formulator (see 2.3 for further details). If the lemma information of a selected lexical item is not available, however, people cannot construct the framework of their utterance.

In learning a lexical item, most L2 learners are likely to check its meaning in their first language (L1) first. When they meet a lexical item for the first time, many of them try to know what the lexical item means in their L1. While the knowledge is enough for them to decode the meaning of input, it is not enough for them to encode their intended meaning.

According to Schmitt (1997), L2 learners use dictionaries for two broad purposes. One is to find out the meaning of a lexical item whose meaning they do not know and the other is to consolidate their

knowledge on a lexical item. Understanding how a lexical item is used belongs to the latter. While the former is considered as one of discovery strategies, the latter is considered as one of consolidation strategies.

The close analysis of the participants' Output 1 in the three experimental studies indicates that many Japanese learners of English do not use their dictionaries to get information on how a lexical item can be used in a sentence. Erroneous expressions were abundant in their Output 1. This may be partly because many Japanese learners of English prefer bilingual dictionaries to monolingual dictionaries and use dictionaries primarily to find out the meaning of a lexical item (Baxter, 1980; Schmitt, 1997). If they use dictionaries for that purpose, they cannot learn lemma information of a lexical item. If the information is not stored in their memory in the first plane, trying to access lemma information of a selected lexical item does not help at all.

It should be stressed here that the participants of the three studies were undergraduate students and were rather successful learners of English given their TOEIC scores. They basically understood the importance of learning English and were strongly motivated to study it. Still, they had difficulty in producing output correctly.

The output-input activity can be a promising activity to solve this problem. As discussed in 6.1.1, the activity encouraged the participants to replace their erroneous linguistic realization with its target linguistic realization. The activity drew the participants' attention to how a lexical item should be used in a sentence and what lexical items it should combine with. It is likely that the activity can draw learners' attention to linguistic aspects which otherwise they would not pay attention to.

As discussed in Chapter 1, advanced learners rely on lexicalized chunks of language which function as wholes and thereby ease processing demands since they are retrieved without internal analysis or construction (Foster, 2001). The output-input activity prompts L2 learners to notice the co-occurrence relation of lexical items. If the incorporated linguistic forms are practiced enough, they will be used as lexicalized chunks. By incorporating grammatical collocations and lexical collocations into their IL

system, L2 learners would greatly improve their ability to produce the TL.

7.2 A Desirable Output Activity

Most L2 teachers are likely to believe that output practice is crucial for developing L2 proficiency (Muranoi, 2007). Output practice provides L2 learners with opportunities to access their knowledge on the TL for production. As a result, they will be able to enhance fluency in the TL. Although it is an important function of output practice, using already-learned linguistic forms repeatedly does not contribute to the qualitative change of their IL system.

Advanced learners usually have developed high levels of strategic competence (Canale & Swain, 1980; Tarone, 1981), and as a result, the growth of their IL system slows down if deliberate attempts are not made to draw their attention to how they are realizing their intended messages linguistically (Swain, 1988, 1993). Their IL system may have fossilized expressions which do not conform to grammatical rules of the TL. If L2 teachers want to employ output practice to combat such fossilization, just speaking and writing are not enough (Swain, 1993). As mentioned above, output practice contributes to IL development if the practice affects cognitive processes such as noticing, hypothesis testing, metalinguistic reflection and syntactic processing. It is necessary for L2 teachers to take this into consideration in implementing an output activity in class.

One prevalent output activity in Japan is to ask learners to translate Japanese into English. Taking the participants' familiarity with the activity into consideration, Study 1 employed the translation task. Although it may be a popular activity, it is not a desirable output activity in that it is less likely to lead learners to think about how a lexical item should be used.

In Study 1, the participants wrote down how they would encode the requested meaning when they looked at the Japanese sentences (see 5.2.4.3). The detailed analysis of their reports of noticing a hole indicates that the most prevalent cognitive activity during the translation task is manipulation of meaning (see Takatsuka, 1999, for further details of manipulation of meaning). Typical examples are:

“*Migaruniryokosuru* means *nimotsuwomotteinai*” and “*Kaimeisuru* means *akirakanisuru*.” These comments qualify as evidence that they manipulated the original meaning so that they could encode the requested meaning. Although manipulation of meaning is a good strategy in that it prevents a breakdown in communication and keeps the communication going, resorting to that strategy excessively prevents L2 learners from developing their IL system steadily.

The effects of producing output on IL development can be maximized if an output activity provides learners with opportunities to reflect on how a lexical item should be used. When L2 teachers implement an output activity in class, they need to contrive a task which prompts learners to do so. In other words, an output task which leads learners to retrieve lemma information of a lexical item is desirable. One of the promising candidates is a technique called guided summarizing which was proposed by Muranoi (2000b). The technique is considered to contribute to enhancing learners’ accuracy in the use of relatively complex grammatical forms (Muranoi, 2002).

7.2.1 The Output-Input Activity With Guided Summarizing

It is necessary to be careful not to assume that output practice can be useful for any learner with any linguistic form under any condition. Whether output practice leads to IL development heavily depends on various factors, including learners’ psycholinguistic readiness and linguistic features of the target form. One way of helping learners manage the cognitive load of simultaneous processing is to give learners more time to plan their production.

The instructional treatment which will be proposed here is called the output-input activity with guided summarizing. In this treatment, L2 learners are directed to reproduce the story of a text that they have comprehended through reading. Then they are provided with relevant input.

Compared with autonomous summarizing in which learners summarize a passage in their own way, guided summarizing is capable of leading learners to use specific lexical items. By directing learners to use specific lexical items, it indirectly guides them to use relevant grammatical forms. It is considered to

be a focus-on-form treatment (see 3.5 for further details of focus on form). If the technique is combined with the output-input activity, steady development of learners' IL system will be brought about. How they can be combined as one activity will be explained in the next part.

7.2.2 Procedure of the Output-Input Activity With Guided Summarizing

The procedure of the output-input activity with guided summarizing consists of four stages.

Stage 1. Learners are provided with a passage and are engaged in comprehension activities such as true-false questions and sight translation.

Stage 2. Following the directions, learners reconstruct the passage they have comprehended in a written mode. The lexical items in the directions are arranged to lead learners to think about how they are used in a sentence. That is, learners are moved to a syntactic mode.

Stage 3. Learners are provided with relevant input. They compare their reconstructed text with the relevant input.

Stage 4. Learners write down what they have noticed in comparing them.

At Stage 1, learners comprehend a passage (see Appendix D for a sample). Teachers' role is to facilitate their understanding by answering questions and explaining difficult linguistic forms.

At Stage 2, they summarize the passage by following the directions (see Appendix E for a sample). As they have to use certain specified lexical items, they are led to think about language. They reflect on how the specified lexical items can be satisfied in a sentence.

At Stage 3, they are provided with relevant input, or the model summary (see Appendix F for a sample). It is assumed that they compare their own linguistic realization with the relevant input, which brings about a cognitive comparison.

At Stage 4, they write down what they have noticed in comparing their summary and the model

summary. That is, they externalize what they have noticed.

Although further research remains to be done to clarify how the output-input activity with guided summarizing contributes to L2 learning, it is quite promising given the results of the studies which have clarified how focus-on-form activities contribute to L2 learning (see 3.5.4 for further details). It should also be noted that the activity leads learners to be involved in “*linguaging*” which is considered to contribute to IL development (Swain, 2006).

7.3 Limitations

Producing the TL prompts L2 learners to move from the semantic and strategic processing to the syntactic and complete processing. The results of the present study basically argue for positive and important roles of producing output and noticing triggered by producing output to play in L2 learning. The output-input activity provides learners with opportunities to notice a hole in their IL system, notice a form in relevant input, notice the gap between their IL form and TL form and reflect on the difference between them. As a result, learners stretch their IL system. On the other hand, however, the present study has several drawbacks which should be improved by further research.

The first drawback is that the present study has not dealt with how producing output and noticing triggered by producing output contribute to the restructuring of learners’ IL system over the long term. When the participants used a linguistic form correctly in the posttest, it was judged that they incorporated the linguistic form. Although this can be used as an indication that learning has occurred, one may also argue that the form was temporarily retained at a conscious level but not fully integrated yet and that learners may cease to use the temporarily retained form after some time. It is clear that exposure to relevant input once is not enough for learners to learn a new linguistic form and that repetition is a crucial factor in learning an L2. Given the limited amount of treatment the participants received in the three experimental studies, the results shed no light on the long-term effects of producing output and noticing triggered by producing output on learners’ IL development. All the author can say with certainty is that the

output-input activity contributes to L2 learning in its own way and help learners retain the noticed linguistic forms for a certain period of time.

The second drawback is concerned with the independent variable which was employed for the three experimental studies. As explained in 5.1.1, the participants' proficiency in the TL was employed as the variable. As discussed in 6.1.6, the participants' proficiency in the TL is not good enough to explain their ability to notice a form in input.

The third drawback is related to the second drawback partially. As the participants' proficiency in the TL was employed as the variable, there is no knowing how much knowledge each participant had on the target linguistic forms employed in the three studies. Concerning the incorporation of linguistic forms in the posttest, two interpretations are possible: (1) The participants incorporated new linguistic forms through the output-input activity and (2) The participants' prior knowledge on target linguistic forms was activated through the output-input activity and they used them correctly in the posttest. It should be admitted that the results of the present study cannot make a clear distinction between them.

The fourth drawback is concerned with the methodology of the present study. In the three experimental studies, the participants were asked to write down what they had noticed in looking at relevant input. This means that they were given an opportunity to verbalize, or externalize, their inner thoughts. This should be regarded as an opportunity for learning. Writing down what they had noticed also contributed to the incorporation of linguistic forms along with producing output and noticing triggered by producing output.

The fifth drawback is concerned with the generalizability of the present study. The participants of the three studies were undergraduate students and were rather successful learners of English. Although they had difficulty in producing output, it seemed they had abundant knowledge on the TL. Even the participants belonging to the Lower group in the three studies were not at a beginning stage of learning. As Yamaoka (2006) states, L2 learners at a beginning stage "need to intensively experience exemplars of the target language usage" (p.5). The results of the present study cannot be generalizable to learners whose

linguistic resources are limited such as junior high school students.

The last drawback is concerned with internally primed noticing a form and externally primed noticing a form (see 6.1.4 for further details). Although it is certain that they both exist theoretically as shown in Figure 6.2, the data which was collected does not serve the purpose of making a sharp distinction between internally primed noticing a form and externally primed noticing a form. When how noticing a form contributed to the incorporation of linguistic forms was discussed in 6.1.2, the author was not able to make a distinction between them. It is likely that their relative impacts on the incorporation of linguistic forms may be different.

7.4 Future Studies

As discussed in 2.4.1, considerable research effort was devoted to the study of input and output was regarded as a consequence of learning in the early 1980s. Although quite a few researchers now agree that producing output constitutes part of the process of L2 learning and contributes to L2 learning in its own way, further research is still needed to elucidate how producing output contributes to IL development. Studies investigating the roles of noticing to play in L2 learning are also necessary.

First, longitudinal studies which investigate whether producing output actually contributes to IL development are necessary. Although the present study has not dealt with long-term effects of producing output and noticing triggered by producing output on IL development, it is an issue of great interest and importance whether the effects of producing output on the incorporation of linguistic forms last for a certain period of time.

Second, future studies should address the issue of learner characteristics. The results of the three studies reviewed in Chapter 5 have suggested that learners with high proficiency in the TL benefit more from the output-input activity than learners with low proficiency in the TL. For learners to benefit from producing output, they need to have certain amount of knowledge on the TL. The threshold level of English proficiency required to benefit from producing output should be clarified by future studies.

Third, experimental studies are necessary to clarify desirable output activities. Output practice can contribute to the development of learners' IL system if the practice successfully affects cognitive processes such as noticing, hypothesis testing, metalinguistic reflection and syntactic processing.

Fourth, future studies should investigate whether the output-input activity with guided summarizing that was proposed can be an effective means for Japanese learners of English to develop the ability to produce the TL correctly and appropriately. Although it is quite promising theoretically, the activity remains to be evaluated empirically by future studies.

Fifth, future studies should clarify relative effects of internally primed noticing a form and externally primed noticing a form on the incorporation of linguistic forms. Although they were treated as one in the present study, they may have different influences on L2 learning.

One of the important purposes of the studies on L2 learning is to clarify how teachers' intervention would facilitate learners' IL development. Although some researchers consider (for example, Krashen, 1985; Bruner, 1992) that a good deal of SLA happens incidentally, the author believes that L2 learners can develop their IL system efficiently if teachers' intervention matches their psychological readiness. The author hopes that what the present study has clarified will contribute to the further development of research on producing output and noticing and to the improvement of English language education in Japan.

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Appendices

Appendix A: Linguistic Items Used in Study 1

The underlined parts were used to judge whether the participants incorporated the target linguistic forms or not.

1. New Lexical Items

(1) The storm has gradually abated. (あらしが次第に治まってきた。)

(2) When I came home, my house had been ransacked by burglars.

(家に帰ると、我が家は強盗に荒らされていた。)

(3) Her arms were mutilated in the accident. (彼女の腕は事故で切断された。)

(4) The studies elucidate earth environment issues scientifically.

(その研究は地球環境問題を科学的に解明している。)

2. Familiar Forms with New Meanings

(1) I always travel light whenever I go abroad. (私は海外に行くときはいつでも身軽に旅行する。)

(2) I am working part-time at a convenience store. (私はコンビニでアルバイトをしています。)

(3) Tom waved goodbye to us. (トムは手を振って私たちに別れを告げた。)

(4) It's hard for me to meet my father's expectations. (父の期待に応えるのは難しい。)

(5) The apple tree is dying. (そのリンゴの木は枯れかけている。)

(6) There's a good chemistry between us, isn't there? (私たちって相性がいいのね。)

(7) What the teacher said cut me badly. (先生の言ったことは、ひどくこたえた (辛かった)。)

(8) An old car eats gas. (古い車はガソリンを食う。)

Appendix B: A Model Passage Used in Study 2

Kurashiki is a traditional Edo-period Town. It is located between Okayama and Hiroshima. It takes

about 5 hours by bullet train from Tokyo.

First, I recommend you to go to the traditional area along the canal and look at the old rice storehouses. Nowadays, the storehouses have been converted into museums and shops. You can take a look around the shops and find some interesting souvenirs.

Try *kibi dango*, a traditional Japanese sweet made of rice and sugar. It is said that Momotaro, the hero in a famous old story, took these with him when he went to fight against ogres.

Second, you shouldn't miss Ohara Art Museum. Besides western paintings, you can see beautiful Japanese folk art: pottery, textiles, and woodblock prints made by Japanese artists during the 1920s.

Finally, you should definitely go to a place called Tsurugata for lunch or dinner. It is near Ivy Square. It serves only tofu dishes.

Appendix C: Model Sentences Used in Study 3

The underlined parts were used to judge whether the participants incorporated the target linguistic forms or not.

- (1) The portrait of the young woman reminded him of the happy hours spent in her company. Not wishing to part with the picture, he told Mona Lisa's husband that it was not finished.
- (2) In feudal times a man remained what he was born to be. If he was a farmer or a laborer, he remained a farmer or a laborer all his life.
- (3) A plain person may admire beauty, and a weak person may admire strength, all the more for not possessing it.
- (4) The meeting was very successful. More than a dozen schools took part in the contest. I wish you had been there with us then.

Appendix D: A Sample Passage Used for Reading Comprehension

The last Wednesday of April is International Guide Dog Day. Countries around the world rely on dogs to guide those with visual impairment. But the way the dogs are treated differs from country to country, revealing a lot about the character of each nation that uses them.

Guide dogs are quite common in Britain, which is the birthplace of the Labrador retriever, the most common type of Seeing Eye dog. There are no laws governing the promotion or training of these guide dogs, however, and there are only about 4,500 of them in the country. Because people in Britain traditionally regard dogs as members of the family, they are very kind to Seeing Eye dogs and their users.

Some 10,000 guide dogs are active in the United States, where the rights of the users are protected under the Americans with Disabilities Act. This law places guide dogs in the same category as wheelchairs and other equipment that is used to help the physically impaired, legally ensuring the rights of guide dog users.

There are around 305,000 visually impaired in Japan, but only 948 Seeing Eye dogs were active here as of March 31, 2004, according to the Japan Guide Dog Association. Most dogs have traditionally been kept outside in this country, and people aren't accustomed to having guide dogs accompany their users indoors. Legally, though, guide dogs are allowed to go anywhere their users go. In actual practice, unfortunately, they are sometimes refused entry in certain shops or vehicles.

People should become aware that Seeing Eye dogs are not pets. They are meant to serve people and have all passed demanding tests after going through a period of training. So when you see a Seeing Eye dog on the street or on the train, show the dog and its user your warm understanding. And remember, don't touch the dogs while they're working. If the user seems to be in trouble, don't hesitate to speak to him or her. Your understanding will help guide dogs work more effectively.

(Taken from Matsuo, H., Chiba, M., & Okazaki, K. (Eds.). (2006). Open your eyes. In H. Matsuo, M. Chiba, & K. Okazaki (Eds.), *Reading Focus of the World* (pp. 28-29). Tokyo, Japan: Sanshusha.)

Appendix E: Directions for Guided Summarizing

【指示】

下記の指示に従って passage の要約を完成させてください。要約は5つの段落から構成されています。なお、括弧内の数字は各段落を何文で要約するかを示しています。指定されている表現を必ず使用して要約を完成させてください。

1. 第一段落 (1文)

- ・ 概要：世界中の国々は盲人の誘導を犬に行わせており、国によってその犬の扱われ方は異なる。
- ・ 使用するべき表現：depend, treat

2. 第二段落 (2文)

- ・ 一文目の概要：Labrador retriever 生誕の地である英国には、介助犬の訓練を管理する法律がない。
- ・ 使用するべき表現：there are, governing, these guide dogs
- ・ 二文目の概要：伝統的に犬は家族の一員とみなされてきたので、英国の人々は介助犬と介助犬の使用者に対してとても親切である。
- ・ 使用するべき表現：traditionally, are regarded, are kind to

3. 第三段落 (2文)

- ・ 一文目の概要：アメリカでは、約10000頭の介助犬が働いている。
- ・ 使用するべき表現：working
- ・ 二文目の概要：この国には介助犬を車椅子と同じカテゴリーに位置づける法律があり、介助犬使用者の権利は法律によって守られている。
- ・ 使用するべき表現：a law placing, in the same category, legally

4. 第四段落 (2文)

- ・ 一文目の概要：日本では犬は伝統的に屋外で飼われてきたので、人々は介助犬がその使用者と一緒に屋内に入ってくることに慣れていない。
- ・ 使用するべき表現：kept outdoors, aren't accustomed to, accompany
- ・ 二文目の概要：そのため介助犬はお店や乗り物に入ることを断られることがある。
- ・ 使用するべき表現：refused entry

5. 第五段落 (3文)

- ・ 一文目の概要：介助犬はペットではないと理解することが必要である。
- ・ 使用するべき表現：necessary for us
- ・ 二文目の概要：通りや列車で介助犬を見かけたら、犬と使用者に暖かい理解を示してください。
- ・ 使用するべき表現：street, train, warm understanding
- ・ 三文目の概要：温かい理解があれば、介助犬はより効果的に働くことができる。
- ・ 使用するべき表現：With, effectively

Appendix F: A Model Summary of Appendix D

Countries around the world depend on dogs to guide blind people and each country treats the dogs in different ways.

In Britain, which is the birthplace of the Labrador retriever, there are no laws governing the training of these guide dogs. Because dogs are traditionally regarded as members of the family, people in Britain are very kind to guide dogs and their users.

In the United States, about 10,000 guide dogs are working. This country has a law placing guide dogs in the same category as wheelchairs and the rights of the guide dog users are legally protected.

As dogs have traditionally been kept outdoors in Japan, people aren't accustomed to having guide dogs accompany their users indoors. Because of that, guide dogs are sometimes refused entry in certain shops or vehicles.

It is necessary for us to understand that guide dogs are not pets. If you see a guide dog on the street or on the train, please show the dog and its user your warm understanding. With your understanding, guide dogs can work more effectively.