교수법에 관한 제2언어습득이론으로서 VanPatten의 입력처리이론 평가

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요약

본 연구는 이론의 가치를 평가하는 객관적인 준거에 근거하여 VanPatten의 입력처리이론을 평가하였다. 입력처리이론에 근거한 교수법은 전통적인 문법교수법이나 의미중심의 발화교수법보다 더 효과가 높으며 구조화된 입력처리 활동이 주요한 요인인 것으로 기존연구에서 보고되었다. 입력처리이론은 실증연구를 통한 입증가능성과 설명의 내적다탕성이 높은 것으로 나타났다. 그러나 외적타당성은 비교적 약하며 이론적 설명의 범위 또한 입력처리에 관련된 부분으로 제한되어 있다. 향후 지속적인 연구의 외연을 넓힌다면 교수환경 내에서 발생하는 제2언어습득의 효과를 검증하는 실증 연구의 이론적 틀로서 계속적으로 획기적인 역할을 할 수 있는 유용한 이론으로 판단된다. 본 논문에서는 특히 입력처리이론이 EFL환경인 한국에서의 영어교육과 제2언어습득이론의 발전을 위해 제공하는 시사점을 논의한다.

Evaluation of VanPatten's Input Processing Theory as a Theory of Instructed Second Language Acquisition

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ABSTRACT

This study evaluated VanPatten's Input Processing Theory, which underpins what is known as Processing Instruction. This review revealed that Processing Instruction is more effective than traditional and meaningful output-based instruction, and this effect results mainly from structured input activity. Input Processing Theory has a high level of empirical verifiability and internal explanatory validity. However, it has relatively weak external validity and its scope is limited to input processing. It is expected to continue playing a monumental role as a theoretical framework for empirical research. Implications are discussed in relation to EFL teaching in Korea and the advancement of instructed second language acquisition theory.

Key Words: input processing theory, processing instruction, information processing, second language acquisition, structured input

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Ⅰ. Introduction

Learning a second language (L2) involves years of repeated exposure to an enormous amount of input[1]. Krashen, in his Input Hypothesis, highlighted the primacy of input in acquiring an L2 by stating that comprehension of new input is the sufficient condition for second language acquisition (SLA)[2]. Research conducted in the Canadian immersion context, however, indicated that exposure to input alone does not guarantee full mastery of all essential aspects of the L2. For example, researchers have found that English-speaking L2 learners of French still produced ungrammatical L2 morphosyntactic features despite exposure to years of target-like input[3].

This finding implies that not all features of input are utilized for acquisition. VanPatten argued that L2 learners' difficulties with processing L2 input are a significant factor accounting for the inadequacy of input in fully mastering an L2[4]. According to VanPatten's principles of L2 input processing, L2 learners' attentional focus is primarily placed on lexical items and grammatical forms essential for comprehension, which results in processing of meaning, not necessarily processing of form[5]. VanPatten stressed that L2 learners' default orientation toward meaning-focused processing needs to be complemented by what is widely known as Processing Instruction (PI), which draws L2 learners' attention to redundant yet necessary L2 grammatical forms through explicit grammatical explanation and structured input activities that provide numerous relevant examples[5].

Following VanPatten's call for attention to this issue, a number of empirical studies on PI's effects on L2 learning have been conducted, which in turn have contributed to an enhanced understanding of the relative effect of PI on L2 learning over other types of L2 instruction. On the other hand, an issue has been raised at a more theoretical level regarding whether the theory of PI is truly a theory of SLA comprehensive enough to account for a significant portion of the complexity of SLA. Doughty pointed out that the theory of PI is only concerned with input features that pose processing-related challenges, not other types of learning difficulties[6]. In fact, considering other crucial conditions of SLA such as interaction and output production, the sole focus of VanPatten's Input Processing Theory (IPT) on L2 learners' input processing strategies challenges its status as a theory of SLA. Thus, this paper is aimed at evaluating IPT to determine its viability as a theory of SLA based on three objective criteria for theory evaluation. This paper first examined how IPT has contributed to the development of the field of SLA in terms of the advancement of scientific knowledge and practical applications. To lay the groundwork for theory evaluation, the following section discusses three criteria for evaluating SLA theories, which is followed by a brief review of previous research on PI. The final section discusses some key implications of PIT and PI in the Korean EFL context of teaching and provides suggestions for future research on PI in Korea.

II. Criteria for Evaluating an SLA Theory

Larsen-Freeman and Long stated that building a rigorous theory is an essential first step to facilitate SLA research because a good theory provides

researchers with a coherent framework for conducting empirical studies productively and interpreting research findings in a valid manner[7]. Larsen-Freeman and Long discussed two different types of theories: *set-of-laws* and *causal-process* theories. Set-of-laws, though useful for generalizing consistent research findings, do not provide an explanation. A casual-process theory, in contrast, is a more desirable theoretical model to explain SLA phenomena that have been already identified. Causal-process theories provide some causal statements aimed at answering the *how* and *why* of the existing phenomena. This type of theory allows researchers to formulate testable hypotheses and conduct empirical research to verify the hypotheses in focus. To summarize, Larsen-Freeman and Long view a viable SLA theory as one that provides an interim explanation that can be empirically verified, which suggests that *empirical verifiability* should be a primary criterion for evaluating SLA theories.

Once a theory is empirical verifiable, it is important for the theory to explain what role language use plays in SLA. This issue is important because all humans acquire a new language, both L1 and L2, by using the language they are learning to a large extent. Even the theory of Universal Grammar, the strictest innatist theory, assigns a role to linguistic input in language acquisition. Other theories, needless to say, view language use as conducive to SLA in one way or another. A useful SLA theory, thus, needs to provide a valid explanation regarding how L2 use (i.e., both comprehension and production) influences L2 development and eventual acquisition. In other words, a valid theory of SLA must explain the relationships among L2 use, development, and the ultimate end state of L2 development.

SLA theories concerned with the role of instruction in L2 development, however, should be distinguished from theories focusing on the end state of SLA (e.g., Critical Period Hypothesis) or naturalistic L2 development (e.g., Acculturation Model) because theories of instructed SLA focus on explaining cognitive or psycholinguistic processes involved in an effective instructional intervention. IPT is concerned with classroom-based SLA processes. Thus, it is important to see whether IPT *adequately* explains the cognitive mechanisms involved in L2 learning and the workings of the causal variables involved in instructional techniques utilized.

Third, the *scope* of the explanation is to determine whether a SLA theory accounts for an adequate portion of SLA phenomena. these three criteria have been selected to evaluate the IPT in this paper.

표. 1. 이론평가의 준거
Table 1. Criteria for Theory Evaluation

Criterion	Description
Empirical verifiability	Does the theory provide theoretical constructs that can be easily operationalized and thus be empirically verified?
Explanatory validity	Does the theory provide a sufficiently valid explanation, not simply a description, of both the systematicity and variability of L2 development and/or acquisition triggered by instruction?
Scope of explanation	Does the theory provide an adequately comprehensive explanation of SLA or is its explanation limited to only a particular aspect of SLA?

The next section reviews previous research on PI before its evaluation.

III. Review of PI Research

VanPatten noted the observation that L1 input processing strategies L2 learners bring to their L2 learning situations sometimes prevent them from processing L2 input appropriately due to their limited attentional capacity[4]. This limited attentional capacity model originated from early psychological research[8][9]. Shiffrin and Schneider, in particular, identified two types of information processing: the controlled processing and the automatic processing modes[10]. The controlled processing mode demands much more attentional energy and its typically employed in the processing of new information whereas the automatic processing mode is a relatively effortless process. Psychological research on attention also revealed that due to capacity limit, attention is selectively distributed to incoming stimuli[11]. In other words, if a certain type of input consumes too much attentional energy, the processing of other types of input is inhibited. Many psychologists claimed that learners need to pay attention to input to store it in short-term memory, a necessary step toward the eventual acquisition of new knowledge[10][12][13][14]. Their research had exerted a profound influence on SLA research and the widely accepted assumption that attention is indispensable for L2 learning[15]. VanPatten's IPT is based on this limited attentional capacity assumption. Faced with the challenges of real-time language processing, L2 learners tend to focus on meaning, not form. This tendency implies that they do not process L2 forms necessary for L2 learning. Recognizing this processing constraint, VanPatten formulated four input processing principles to address several potential sources of learning difficulties arising from L2 learners' limited input processing capacity and the interference of their L1[5].

These principles are manifested by PI in the classroom. Wong provided a detailed description of a typical PI lesson based on VanPatten's conceptualization of L2 input processing[16]. First, L2 learners are presented with explicit information regarding incorrect processing strategies that they might employ in their L2 input processing. Then, the teacher induces L2 learners to use an appropriate processing strategy, and then draws their attention to a communicatively redundant, yet persistently challenging L2 grammatical feature. Then, learners are given a structured input activity that exposes them to numerous examples containing the target linguistic structure. In the structured input activity, L2 learners' newly learned processing strategy is applied to their input processing so that they may be able to convert the essential grammatical features in the input into intake, which can subsequently be integrated into their developing L2 system.

Early empirical studies of PI focused on the comparison of PI with traditional instruction (TI) characterized by its emphasis on mechanical output practice. VanPatten and Cardieno, the earliest empirical study of its kind, investigated their relative effects on college-level Spanish learners' learning of Spanish object pronouns[17]. The results indicated that PI was more effective than TI for comprehension. PI and TI, however, had no significant difference in their effect on production. These findings imply that PI is more advantageous to TI in that PI better promotes comprehension and have a positive effect on production which is comparable to the latter.

Many replication studies followed VanPatten and Cardierno. Cardierno, for instance, compared PI and TI for their effects on Spanish preterit tense[18]. Consistent with the results gained in VanPatten and Cardieno (1993), the results of this study indicated that the PI group outperformed the TI and the control group on the posttests that measured both comprehension and production gains, verifying the superior effectiveness of PI to TI.

A study conducted by VanPatten and Sanz investigated the effectiveness of PI on both oral and written production of L2 discourse involving Spanish object pronouns[19]. The researchers found that PI had positive effects on oral and written-mode tasks: a sentence production task, a video-based narration task, and a question-and-answer task. PI had significant effects in all these tasks except the oral video-based narration task. This study demonstrated that PI is an effective L2 teaching approach for both oral and written L2 learning.

Cheng studied the effect of PI on Spanish copula verbs (i.e., *ser* and *estar*) in comparison with the effects of TI[20]. The tasks employed in this study were interpretation, sentence-level controlled production, and composition tasks. She found that both PI and TI significantly affected the comprehension of the target forms. The PI group outperformed the TI group on one of the two posttests that measured comprehension, even though no significant difference was found on the second posttest. On the sentence-level and the discourse-level production posttests, both PI and TI were significantly effective.

Other studies investigated more specifically which component of PI (i.e., explicit instruction or structured input) accounts for the positive learning outcomes. VanPatten and Oikennon divided treatment groups into three: (1) explicit instruction, (2) structured input, and (3) both combined[21]. The posttest results revealed that the structured input was the significant variable that brought about the positive learning gains on both comprehension and interpretation posttests. There was no statistically significant difference between (2) and (3), which suggests that the explicit information provided to learners prior to structured input was not necessary for learning.

Sanz and Morgan-Short reached the same conclusion that the explicit explanation component may not be essential[22]. In their computer-based study, Sanz and Morgan-Short examined the effect of providing L2 learners with explicit grammatical information on the computer for comprehension and production gains of Spanish preverbal direct-object pronouns. The results indicated no evidence for significant effects of explicit rule presentation on L2 learning.

Later studies compared PI and meaningful output instruction (MOI). As a departure from early comparative studies on PI and mechanical output-based TI, Benati investigated the relative effectiveness of PI and MOI for the acquisition of Italian future verb tense morphology[23]. The findings again lent support to the superiority of PI to MOI.

In contrast, Farley did not find any significant difference between PI and MOI for their effects on the learning of Spanish subjunctive[24]. Both the PI and MOI group improved their L2 comprehension and production performances. However, in a follow-up study, Farley found that the effect of MOI, though as

equally effective as PI, was not held up on the delayed posttest whereas the effect of PI was sustained[25].

Benati conducted a more comprehensive comparative study on the effects of PI, TI, and MOI for the acquisition of English past tense[26]. Benati found that PI was more effective than TI and MOI for comprehension. However, all three instruction types were effective for production.

To summarize, previous empirical studies have found that PI is effective for improving L2 learners' ability to comprehend and produce several morphosyntactic forms in languages including Spanish, Italian, and English. PI has also been found to be superior to TI. However, as several studies showed, its superiority to MOI is not as clear as its advantage over TI, though PI has a more lasting effect than MOI.

Based on this review of previous PI research, the next section discusses the quality of IPT as a theory of SLA based on the three criteria: empirical verifiability, explanatory validity, and the scope of explanation.

IV. Evaluation of IPT

4.1 Empirical Verifiability of IPT

Theories are interim explanations. The value of a theory is primarily contingent upon its potential for empirical verification. To be verified in empirical studies, a theory needs to provide operationalizable theoretical constructs. IPT is credited for the constructs that can be easily operationalized in an empirical study (e.g., PI, TI, MOI, structured input, and explicit information). These precise constructs have contributed to the development of PI research as a systematic and productive research paradigm. It has provided a useful quantitative research framework within which different instruction types were compared for their relative effectiveness for L2 learning. Empirical findings have been utilized to revise or update the explanations of the effectiveness of input processing strategies in relation to other types of instruction.

PI research is in sharp contrast to Krashen's Monitor Theory, which suffers from a lack of operationalizable constructs. Krashen claimed that a sufficient amount of comprehensible input is the only necessary driving force for SLA[2]. Krashen also made the distinction between acquisition and learning to argue that comprehensible input brings about acquisition whereas conscious L2 learning efforts only lead to the development of the learned system, which is separate from the acquired L2 competence[2]. The affective filter was posited to explain individual variation in acquisition outcomes despite the same amount of comprehensible input provided to L2 learners. Krashen argued that when the affective filter is high, which means that L2 learners feel extremely nervous or stressed, L2 learners cannot process comprehensible input.

Larsen-Freeman and Long pointed out that the constructs Krashen coined were just metaphoric terms, not truly scientific[7]. Comprehensible input, though intuitively plausible, cannot be easily operationalized, for instance. Its purported effect on L2 learning, thus, cannot be put to empirical testing. The term, affective filter, is also not precise enough because it may mean

different concepts such as self-esteem, anxiety, or motivation depending on the context. This makes it difficult to tease out the effects of those variables from each other. More seriously, the distinction between acquisition and learning implies a number of theoretical constructs and there is no practical way of testing this hypothesis.

Due to such problems associated with empirical verifiability, Krashen's theory still remains a theory that cannot be verified or falsified. It is not surprising to find that since its original conception, no empirical study has been conducted to verify Krashen's conceptualization of SLA obviously because of its low level of empirical verifiability. In contrast, PI research has produced a number of empirical studies, the findings of which have been used to verify theoretical claims made by VanPatten[4][5]. Thus, in terms of the criterion of empirical verifiability, IPT is considered a viable theory for SLA.

4.2 Explanatory Validity

Studies conducted within the framework of IPT and PI employed a relatively rigorous experimental research design with a control group and one or more treatment groups. The learning measures typically used in those studies include both immediate and sometimes delayed posttests. In addition, the inferential statistical procedures commonly employed by PI studies enabled the researchers to draw valid inferences on actual L2 learning outcomes.

On the other hand, Doughty argued that, due to the discreet nature of the learning measures employed in most PI studies, the validity of the test results is in question[31]. This raises an issue regarding to what extent PI is related to the development of L2 communicative competence. As Doughty acknowledged, however, this problem is not confined to PI because almost all effects-of-instruction SLA studies suffer from a similar problem[27]. Thus, Doughty's criticism is applicable to instructed SLA research as a whole, not just to PI research. It should be noted that PI researchers have been making efforts to address this persistent limitation of instructed SLA research by employing measures gauging both sentence-level and discourse-level production skills[20]. Given this consideration, it can be concluded that PI studies are equipped with relatively strong internal validity.

Regarding its external validity or generalizability, PI has been tested for several representative morphosyntactic and semantic features in several languages: Spanish, French, Italian, and English. This lends support to the view that PI research has yet to achieve a high level of external validity because there are still many languages around the world that have not been explored in the IPT framework. Further effort needs to be made to generalize its effectiveness to other types of intractable grammatical issues in various languages in various institutional settings. PI research, with its high level of empirical verifiability, however, can continue improving its external validity as more and more empirical studies are being conducted on various grammatical structures in various languages.

4.3 Scope of Explanation

Does PI research provides comprehensible explanations of SLA? PI research focuses on the

failure part of L2 development and the effect of intervention utilizing input processing[28]. The processing principles are explanations about why L2 learning results in incomplete success. The major motivation underlying PTI is a pedagogical attempt to intervene in the process of L2 development. For this reason, PI does not provide a detailed explanation of SLA phenomena in general. However, its explanations are solely focused on the workings of input processing and the effects of pedagogical intervention. The psycholinguistic processing model posited to explain the effect of PI (i.e., input>intake>L2 system>output) is concise, yet provides a useful explanation of the impact of PI on a learner's internal L2 system. However, PI does not explain exactly how intake is integrated ito the L2 system, and also why MOI also has comparable effects on the L2 system as PI does. In short, its explanations are not adequate enough, even though its explanations regarding the role of input processing and the effect of structured input are valid.

Another concern is raised regarding the fact that IPT only addresses the processing of input. The issues such as general L2 developmental and final learning outcomes are out of scope in this theory. VanPatten stressed that IPT was never intended to be a comprehensible theory of SLA[5]. He made it very clear that his IP model is concerned only with the conversion of input into intake, which is just an initial step involved in the whole SLA process[15]. This is a factor diminishing its scope to a theory of input processing. A theory that does not address the entire process after the intial input-intake processing stage is not considered a complete theory of instructed SLA.

Lightbown stated that "once this step has taken place, learners need to encounter the language features again and again in discourse-rich contexts where their use is appropriate" (p. 72)[29]. This means that after the input processing stage, interaction and output practice in the L2 bear more importance. Then, the issue becomes not only input but also other elements of L2 learning such as interaction, feedback, and output. Another factor limiting the scope of PI is its sole focus on a particular type of input that poses a learning problem due to L1-L2 typological differences and the associated differences in input processing strategies. Regarding this issue, Doughty pointed out that "if the error was not a consequence of a processing problem, then PI would not be expected to be effective." (p. 289)[6].

Considering the fact that the main goal of an SLA theory is to explain universal L2 learning phenomena regardless of setting and individual differences, the limited scope of current IPT may be an obstacle in assigning IPT a viable general theory of SLA. Recognizing this criticism, VanPatten defended his position by arguing that it is not possible to reduce SLA to a single theory due to its complexity[5]. He further argues that researchers be specialized in different aspects of SLA.

VanPatten's point regarding the complexity of SLA and the inevitable need for dividing various research foci is legitimate. However, just as a company needs a CEO who directs and coordinates the operations of the various departments inside the company, SLA research needs researchers who can draw a big picture of SLA. Maybe, it is possible to develop IPT into a more comprehensible theory of input processing and its impact on L2 learning by conducting studies

on the effect of PI on the longitudinal development of L2 grammatical features.

The literature on interactionist SLA research clearly demonstrates that a theory can expand its scope by drawing on findings from other research realms. Mackey and Philp investigated the effect of intensive recasting imbedded in task-based interaction on the development of English wh-questions. In this case, the developmental stages identified in Pienemann and Johnston (1987) enabled the researchers to draw the conclusion that L2 learners in their study who were both developmentally ready and received intensive recasts on their errors moved up to a more advanced developmental stage of English questions. The use of the target L2 form that has implications for L2 development contributed to the status of the interactionist SLA theory as a theory of L2 development, not just as a theory of interaction and instruction[32][33].

PI research has mainly focused on the effect of PI on the comprehension and production of discreet L2 grammatical forms. To attain at least a status of a theory of L2 development, future PI research may need to investigate the effect of PI on a linguistic structure with a clear developmental sequence. Once its effect on L2 development is verified, then, PI, would be able to expand its scope of explanation into a broader realm of L2 development.

V. Conclusion and Implications

This evaluative review of IPT and PI research presented in the preceding section suggests that conducting more comparative studies on the relative effects of various types of PI and output-based instruction on long-term L2 learning both at the sentential and discourse levels would be highly productive because previous research has not found enough evidence for the superiority of PI to MOI. Also, PI research may need to strengthen its generalizability by conducting more empirical studies with learners having various L1 backgrounds and by testing its hypotheses in various languages in various settings other than the US.

Another viable research option would be a meta-analysis of previous studies of PI because most PI studies have employed relatively strong experimental designs, which allows researchers to calculate the effect sizes of various treatments. Such a meta-analysis would be conducive to reexamining the practical effectiveness of PI for L2 learning and also discovering further promising research agendas.

In line with the necessity of further research on PI in various contexts, the application of PI to Korean EFL teaching would make a meaningful step forward especially when it is considered that there have been almost no studies of PI in Korean EFL settings. Only one study by Hwang has been done and even that was not a study which compared the actual effect of PI in comparison with MOI or TI[34]. It investigated through a survey the perceptions of Korean EFL learners regarding the use of structured input. Therefore, comparative studies on the relative effects of various types of PI and MOI in Korean EFL settings would reveal a clearer picture of IPT as a theory of SLA processes in relation to pedagogical intervention.

There are some viable target forms for a PI study

in Korean EFL settings that may give syntactic and semantic difficulty to Korean EFL learners. First, negative yes/no questions are known to be difficult to Korean EFL learners because the answers of which have exactly the opposite meaning in English[35]. The interpretation of a universally quantified noun phrase and negation (e.g., the boy didn't eat every cookie) poses yet another difficulty to Korean learners[36]. Other viable linguistic targets include the incorrect use of no with nonreferential there (e.g., *there's no any questions which check students' reading comprehension), ungrammatical passives with ergative verbs (e.g., *it is ridiculous that most women in developing countries are suffered from extreme poverty), and conditionals[35]. Finally, long-distance subject wh-question constructions (e.g., who did the girl think pinched the pig? vs. Who did the boy think the cow pinched?) would also be a legitimate issue to tackle within the PI framework[37].

In conclusion, IPT has both strengths and limitations as a theory of SLA in terms of empirical verifiability, explanatory validity, and the scope of explanation. PI has provided a useful theoretical framework for numerous empirical studies. It has often been updated in the process of empirical verification during which hypotheses have been tested, verified, or sometimes rejected. This sound theory building process has also enhanced its explanatory power. Even though the scope of its explanations is mostly focused on the comprehension and production of discreet L2 grammatical forms posting processing-related learning difficulties, PI has enough potential to become a more comprehensible theory of instructed SLA in the future. The current status of IPT can be summarized in a single statement as a valid casual-process theory of L2 input processing with a very limited scope. Future research on PI is expected to make continued contributions to a better understanding of SLA processes and effectiveness of L2 instruction for SLA.

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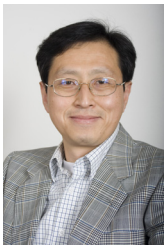
저자소개



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