

# PAC3 at JALT 2001

Conference  
Proceedings



International  
Conference  
Centre

Kitakyushu  
JAPAN

November  
22-25, 2001

## Comprehension and Production: How are they relevant to language learning?

*Shinichi Izumi*  
*Sophia University*

This paper examines previous literature in language acquisition and cognitive psychology on the comprehension and production processes in order to illuminate the psycholinguistic rationale of the *Output Hypothesis*. It is argued that the benefits of output for language learning may be found in the processes of grammatical encoding and monitoring that occur during production. These processes enable the learners to assess what they can or cannot express in the target language, which may serve as an internal priming device for consciousness-raising for the learners. The resultant state of alertness may then prompt the learners to take several alternative solutions depending on the given production circumstance. Intervening in this process, however, are situational, linguistic, and task variables, which can all affect the extent to which the relevant psycholinguistic mechanisms are engaged. Specifying these conditioning factors is an issue for focused investigation in future research.

本稿では言語習得研究及び認知心理学における言語理解と発話の過程の先行文献を概観し、第二言語習得における発話仮説の心理言語学的根拠を探りたいと思う。言語学習における発話の有用性は、発話中に起こるとされる文法化とモニターリングの中にあるとされる。すなわち、これらの過程が学習者に自分は対象言語で一体何をどれくらい言うことが出来るのかということ気付かせ、そしてそれが

学習者自身の中で言語学習への意識の高揚を促すとされる。その結果、発話状況に応じて学習者は学習へとつながる様々な方法を取っていくことになる。しかしながら、これらの心理言語学的なメカニズムが有効に作用する為には、状況的、言語的、またはタスク的な要因が重なり合って影響を及ぼしている。今後の研究の焦点は発話が言語学習につながることを左右する要因をより詳細に解明していくことであろう。

In second language acquisition (SLA) literature in general, and in focus-on-form literature in particular, it has often been claimed that input comprehension and output production are the two things that are crucial for language learning. In teaching, too, comprehension and production are considered important, especially in communicative language teaching contexts. But how does comprehension contribute to language learning? How is production, or output, relevant to focus on form in language teaching? In this paper, I'd like to grapple with these important issues from a psycholinguistic perspective. Specifically, I will review relevant literature in language acquisition and cognitive psychology on the comprehension and production processes in language use and learning, with the ultimate aim of discovering the psycholinguistic rationale of the *Output Hypothesis* in SLA.

## The Role of Output in SLA—Swain's *Output Hypothesis*

First, let me start with a general background of the *Output Hypothesis* (OH). In the SLA literature, it has often been assumed that output is only a sign of SLA that has already taken place and that it does not serve any significant function in language acquisition processes. However, such a limited view of output has been questioned by Swain (1985) who proposed the OH. Swain's OH postulates active roles played by output in the overall SLA processes. It was formulated in reaction to Krashen's (1985) claim about the major role of "comprehensible input" in SLA and is based on many years of research on Canadian immersion programs. Decades of research in the immersion classes have found that these programs generally have great success, producing students with excellent listening comprehension skills, fluency, functional abilities, and confidence in using their second language (L2). Despite the general success, however, we have also learned that immersion learners, even after many years in these programs, still fail to achieve high levels of performance in some morpho-syntactic aspects of the target language (TL).

Swain argues that one of the reasons for this is that these students engage in too little language production, which prevents them from going beyond a functional level of L2 proficiency. In other words, what is missing



for immersion learners are opportunities for output, especially, opportunities to be pushed to be more comprehensible and accurate in the TL. Swain, thus, argues that comprehensible input is not enough; we also need “comprehensible output” for L2 development. The construct of comprehensible output posits that when learners experience communication difficulties, they will be pushed into making their output more precise, coherent, and appropriate, and this process is said to contribute to language learning. It is claimed that producing the TL may serve as “the trigger that forces the learner to pay attention to the means of expression needed in order to successfully convey his or her own intended meaning” (Swain, 1985: 249).

Since the OH was first proposed, Swain (1993, 1995) has refined her hypothesis and specified the following four functions of output:

1. Output provides opportunities for developing automaticity in language use (*the fluency function*).
2. Producing output is one way of testing one’s hypotheses about the TL (*the hypothesis-testing function*).
3. Output makes learners reflect on their own TL use, raising their metalinguistic awareness (*the metalinguistic function*).
4. Output helps learners to notice the knowledge gap, leading them to recognize the inadequacy in

their IL and prompting them to find solutions (*the noticing/triggering function*).

Swain’s OH is now widely recognized as an important part of an overall SLA theory. As such, it has prompted some empirical research on the role of output in SLA. However, discussion on the psycholinguistic basis of the OH has been scarce. I will attempt to fill this gap in the following sections.

## Speech Comprehension Processes

Before we tackle the issue of the psycholinguistic processes of output, we need to first address why comprehensible input is not enough to drive the learners’ IL development. That is, what is the nature of human speech comprehension, and how is it related to SLA? Decades of research in psycholinguistics give us some useful insights in this regard. Some of the major characteristics of human speech comprehension processes may be briefly summarized as follows (for detailed discussion, see Fender, 2001; Garrett, 1991; Rost, 1990; Scovel, 1998; Tyler & Tyler, 1990; Wingfield, 1993):

- Comprehension processes rely on three types of information: linguistic input, contextual information., and the recipient’s linguistic and other general knowledge of the world, including

- semantic and pragmatic knowledge.
- Comprehension is differentially affected by the linguistic devices used in the sentence. The use of linguistic cues in comprehension processes is referred to as *bottom-up processing*.
- Comprehension is differentially affected by the existence, type and the amount of contextual clues provided. People tend to seek contextual consistency in comprehending speech.
- Comprehension is differentially affected by the general world knowledge possessed by the recipients. The use of contextual clues and world knowledge in comprehension processes is referred to as *top-down processing*.
- Comprehension is selective because humans possess limited processing capacities.

These characteristics of the human speech comprehension system suggest that highly complex processes underlie speech comprehension. People do not rely on only one general knowledge source to understand speech, but they use various resources available to them, using both top-down and bottom-up approaches, to arrive at the comprehension of the input messages.

In fact, some researchers argue that even adult native listeners/readers do not use the two general approaches of syntactic and semantic processing equally

in comprehending speech. Clark and Clark (1977), for example, argue that syntactic information may be circumvented in comprehension processes in listening and reading because people can usually make good guesses about what is to be comprehended even before they hear/read anything. In reading research, Stanovich's (1980) interactive-compensatory model of reading posits that the reader is not merely a passive recipient of the printed information, but as an active subject in the whole process who uses all the knowledge resources available to him/her. What is particularly interesting about this model is not just the interactive nature of the reading processes, but its compensatory mechanisms. If there is a deficiency in any particular process (e.g., weak syntactic knowledge), other processes (e.g., higher-order knowledge structures, such as contextual or general world information that the reader has access to) can compensate for the weak knowledge source. Thus, with information provided simultaneously from several knowledge sources, a deficit in any knowledge results in a heavier reliance on other knowledge sources.

In first language acquisition literature, it has been claimed that children typically rely on general world knowledge for comprehension, such as their general knowledge about the instigators of actions which are typically animate, probable relations between nouns in a sentence, and the knowledge of the usual routine in particular circumstances to decide how to act. In SLA



as well, restricted L2 knowledge of the learners makes them rely on certain strategies more than others. Skehan (1996, 1998), for example, argues that L2 learners use a variety of strategies of comprehension that may obviate careful attention to form. Skehan points out that L2 learners are those who have ‘schematic knowledge’ (i.e., factual and sociocultural background knowledge and discoursal procedural knowledge), but have limited ‘systemic knowledge’ (i.e., syntactic, semantic, and morphological knowledge). Such learners may be likely to exploit their schematic knowledge to overcome limitations in their systemic knowledge. This can lead to a reduced chance for the engagement of the IL system.

To summarize, although the resourceful nature of the comprehension system is highly useful in making L2 comprehension possible, this also implies that L2 learners can attain an adequate level of comprehension without necessarily focusing on many formal features in the input. This can lead to a reduction in the amount of intake that can be used for final integration in the developing system.

## Speech Production Processes

Now, let us turn to the production processes. In psycholinguistics, Levelt (1989) proposed his influential speech production model. The model is shown in Figure 1. There are five distinct components in his model: the *conceptualizer*, the *formulator*, the *articulator*, the

*audition*, and the *speech comprehension system*. There are also three sources of knowledge: *lemmas* and *forms* contained in the *lexicon* and *discourse model*, *situation* and *encyclopedic knowledge* that is connected to the conceptualizer.

A message is generated in the conceptualizer, which produces a *preverbal message* as its output. The formulator converts it into a *phonetic plan* by selecting words and specifying grammatical and phonological configurations of the message. The lexicon feeds into the formulator and provides necessary information in this conversion process. Using the information in the lexicon, the formulator generates a phonetic plan in two steps. First, grammatical encoding of the message takes place by matching the meaning of the preverbal message with the semantic specifications in the lemma. The activation of a specific lemma triggers syntactic building procedures. Second, the phonological encoding takes place by accessing morpho-phonological information stored in the lexicon. The result is a specific *phonetic plan*. The phonetic plan is internally scanned by the speaker via the speech-comprehension system. The articulator, then, converts the phonetic plan into actual speech. The overt speech is guided through the audition into the speech-comprehension system and is checked for any anomalous output. The main work of monitoring is done by the conceptualizer, which attends to the output of the speech-comprehension system.

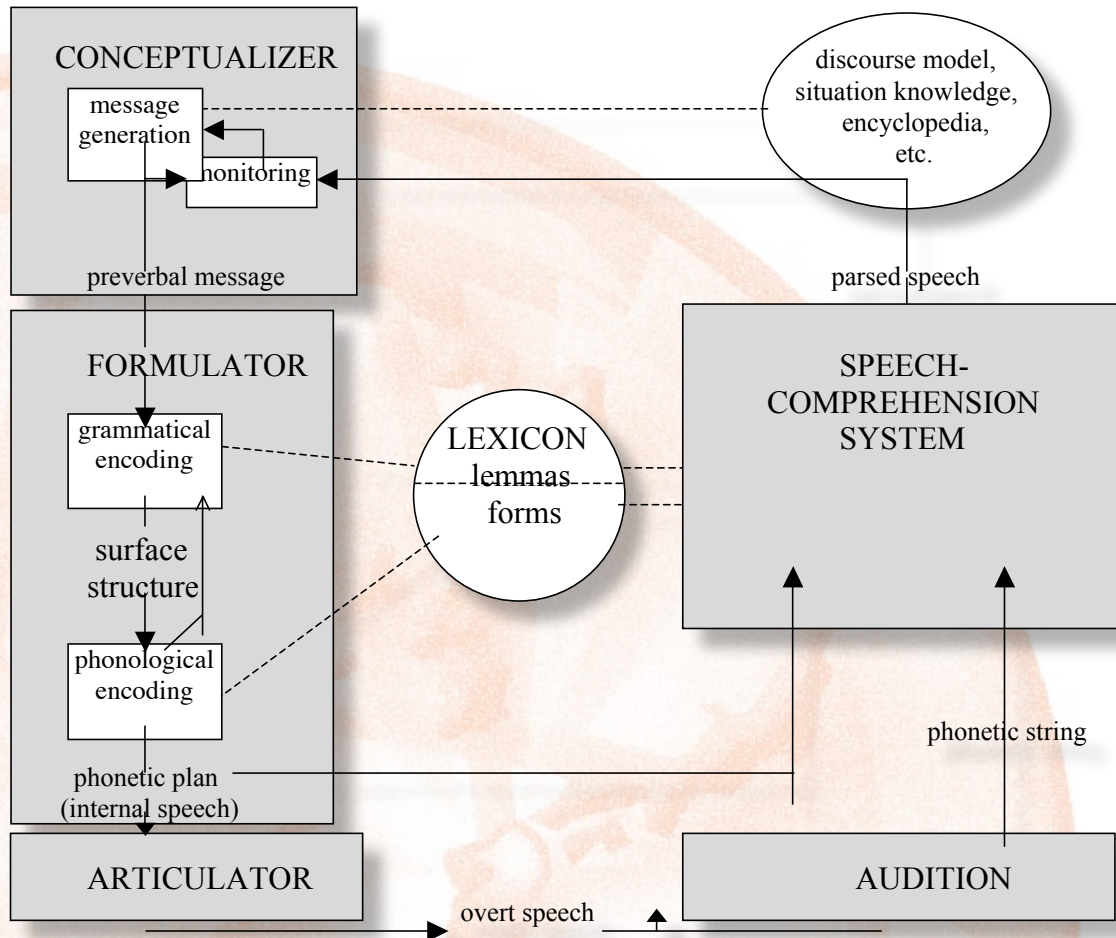


Figure 1: Levelt's speech production model (from Levelt, 1989: 9)



In this process, the grammatical encoding syntacticizes the preverbal message to derive a surface structure of the message, and this requires a focus on syntactic form on the part of the language producer. In production, the speaker is responsible for message generation and formulation, which leaves them much less chance to escape syntactic operations than in the case of comprehension. It is in this sense that output is said to force the learner to move from “the semantic processing prevalent in comprehension to the syntactic processing needed for production” (Swain & Lapkin, 1995, p. 375).

Now, relating Levelt’s model to the OH, Levelt’s model assumes that grammatical encoding by adult native speakers occurs subconsciously and automatically. But this may not be the case for language learners who are still in the process of learning a language and who require a great deal of controlled processing and attention in their language use. It is likely for these people, especially for adult L2 learners, that the very process of grammatical encoding in production sensitizes them to the possibilities and limitations of what they can or cannot express in the TL. Such sensitization may be triggered by the feedback system available for monitoring speech. In Levelt’s model, both internal and overt speech are fed into the speech-comprehension system and back to the conceptualizer to be monitored for matching between the semantic specifications in the

preverbal message and the outcome of the formulation and articulation. The processes of grammatical encoding and monitoring may thus serve as an ‘internal priming device’ for grammatical consciousness raising for the language learner.

In first language acquisition literature, some researchers contend that part of the task of language acquisition is to coordinate comprehension and production. For example, it is observed that children at the telegraphic stage are more likely to respond to adult commands, like *Throw me the ball*, than child-like *Throw ball*. This suggests that in comprehension children initially rely on more adult-like representations of words and phrases not yet reflected in their own production. These representations may “provide a standard to which they will eventually match their own productions of those same linguistic units” (Clark & Hecht, 1983, p. 338). In SLA, de Bot (1992, 1996) proposes that output can facilitate the process of the transition of declarative knowledge to procedural knowledge. This is the fluency function of output. Perhaps more importantly, because the learners’ existing L2 knowledge is still limited, decision problems may be experienced in the monitoring process, which may prompt the learners to recognize the hole or gap in their IL knowledge.

When facing problems in their production process, learners have several alternatives to take depending on

the given situation at the time (and perhaps depending on the individual learners' idiosyncratic preferences as well). The alternatives may include the following:

- a) Despite the uncertainty, learners may try out the outcome because they don't have any other means to express their communicative intention, or they want to try it out and see whether it works. In interactive situations where communication is taking place with an immediate interlocutor, the learners may receive negative feedback from him and confirm, reject, or modify their hypothesis (i.e., *the hypothesis-testing function of output*).
- b) If an 'authoritative' figure, such as a teacher or a NS (or even a dictionary or grammar book), is available, learners may ask him questions or consult with the available information sources in an effort to understand better how the TL works.
- c) Alternatively, in situations where external feedback is not immediately available, as in monologues or communication in writing, learners can resort to other means. If learners are communicating among themselves, specific problems encountered in the process of production and various solutions to the problems may be discussed. The elicitation of relevant input in the collaborative situation may then trigger language learning (i.e., *the metalinguistic function of output*).
- d) If the learner is left on his own to solve the immediate production difficulties, he may engage in various thought processes that can consolidate existing knowledge or possibly generate some new knowledge on the basis of their current knowledge.
- e) If relevant input is immediately available the heightened sense of problematicity during production may cause the learners to process the subsequent input with more focused attention; they may try to examine closely how the TL expresses the intention which they just had difficulty expressing on their own (i.e., *the noticing function of output*).

For teachers who wish to take an active interventionist approach to help their students develop their L2 knowledge, a good intervention point obviously is when the learners' IL system is most open to change, and that is likely to be found when the learners are grappling with the specific means of expression to convey their meaning. In this sense, output produced in meaningful contexts may create potential 'learning space' that can be filled in a timely manner by the teacher (Samuda, 2001). In all cases, learning is believed to be enhanced through the act of producing language, because output, by its mechanisms, increases the likelihood that learners become sensitive to what they can and cannot say in the TL, leading to their



reappraisal of their IL capabilities (Izumi, 2000).

### **Some factors affecting output effects on learning**

With all these psycholinguistic mechanisms available to language learners, an important caveat is that not all circumstances of production may provide language learners with ideal grounds to encourage syntacticization and sensitization to language forms. In many ways, this is similar to the case of comprehension, which does not always guarantee automatic sensitivity to form, but instead requires some conditions for focus on form to occur (cf. VanPatten, 1996). Just as the availability of rich semantic, contextual, or situational information allows the learner to bypass careful syntactic analysis in comprehension, some production circumstances are not particularly conducive to inducing learners' sensitivity to form; hence, the need for 'pushed' output to drive language development (Swain, 1985, 1993, 1995).

Thus, the important issues we need to tackle are not only whether and under what psycholinguistic mechanisms output can enhance learning in general terms, but under what specific conditions it does or does not contribute to language acquisition. Posing these questions is important because it allows us both to consider specific pedagogical recommendations and to address important theoretical issues pertaining to how learner internal factors interact with environmental

factors to effect L2 learning.

Pedagogically, in order to avoid learners' use of avoidance or reduction strategies in their communicative performance, it may be necessary to create tasks that require precise message conveyance for their completion. Cognitive demands of the task may also be manipulated in such a way that the learners can and most likely will pay attention to form. More fundamentally, for output to have any significant impact on learning, a meaningful context for language use needs to be created so that learners can acquire proper form-meaning connections in the L2 (a focus-on-form consideration: Doughty and Williams, 1998; Long, 1991, 1996). In Levelt's model, this means that the coordination between the conceptualizer and the formulator needs to be involved.

### **Conclusion**

In conclusion, I reviewed previous literature relevant to the comprehension and production processes in order to discover the psycholinguistic rationale for the OH in SLA. To recap, I argued that the resourceful nature of the comprehension system is highly useful in L2 comprehension, but often with the cost of reducing the amount of intake that can be used for integration in the developing system. In elucidating the contribution of output to SLA, I argued by drawing on Levelt's production model that the processes of grammatical encoding during production and monitoring enable

the language learners to assess the possibilities and limitations of what they can or cannot express in the TL. These processes are hypothesized to serve as an internal priming device for consciousness raising for language learning. Guided by the knowledge of relevant

psycholinguistic mechanisms underlying the output and input processing, future research should aim to identify the optimal conditions under which successful L2 learning is induced through output and input.

## References

- Clark, E., & Hecht, B. (1983). Comprehension, production, and language acquisition. *Annual Review of Psychology*, 34, 325-49.
- Clark, H., & Clark, E. (1977). *Psychology and language*. New York: Harcourt Brace Jovanovich.
- de Bot, K. (1992). A bilingual production model: Levelt's 'speaking' model adapted. *Applied Linguistics*, 13, 1-24.
- de Bot, K. (1996). The psycholinguistics of the output hypothesis. *Language Learning*, 46, 529-555.
- Doughty, C., & Williams, J. (1998). Pedagogical choices in focus on form. In C. Doughty and J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 197-261). New York: Cambridge University Press.
- Fender, M.J. (2001). A review of L1 and L2/ESL word integration skills and the nature of L2/ESL word integration development involved in lower-level text processing. *Language Learning*, 51, 319-396.
- Garret, M. (1991). Sentence processing. In D. Osherson and H. Lasnik (Eds.), *Language: An invitation to cognitive science*, Cambridge, Mass.: The MIT Press.
- Izumi, S. (2000). *Promoting noticing and SLA: An empirical study of the effects of output and Input enhancement on ESL relativization*. Unpublished Ph.D. dissertation, Georgetown University.
- Krashen, S. (1985). *The input hypothesis: issues and implications*. New York: Longman.
- Levelt, W. (1989). *Speaking: From intention to articulation*. Cambridge, Mass.: The MIT Press.
- Long, M. (1991). Focus on form: A design feature in language teaching methodology. In K. deBot, C. Kramsch and R. Ginsberb (Eds.), *Foreign language research in crosscultural perspective* (pp. 39-52). Amsterdam: John Benjamins.



- Long, M. (1996). The role of the linguistic environment in second language acquisition. In W. Ritchie and T. Bhatia (Eds.), *Handbook of research on second language acquisition* (pp. 413-468). New York: Academic Press.
- Rost, M. (1990). *Listening in language learning*. New York: Longman.
- Samuda, V. (2001). Guiding relationships between form and meaning during task performance: The role of the teacher. In M. Bygate, P. Skehan and M. Swain (Eds.), *Researching pedagogic tasks: Second language learning, teaching, and testing* (pp. 119-140). Harlow: Pearson Education.
- Scovel, T. (1998). *Psycholinguistics*, Oxford: Oxford University Press.
- Skehan, R. (1996). A framework for the implementation of task-based instruction. *Applied Linguistics*, 17, 38-62.
- Skehan, R. (1998). *A cognitive approach to language learning*. Oxford: Oxford University Press.
- Stanovich, K. E. (1980). Toward an interactive-compensatory model of individual differences in the development of reading fluency. *Reading Research Quarterly*, 16, 32-71.
- Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In S. Gass and C. Madden (Eds.), *Input in second language acquisition* (pp. 235-253). Rowley, Mass.: Newbury House.
- Swain, M. (1993). The output hypothesis: Just speaking and writing aren't enough. *The Canadian Modern Language Review*, 50, 158-64.
- Swain, M. (1995). Three functions of output in second language learning. In G. Cook and B. Seidlhofer (Eds.), *Principles and practice in applied linguistics: Studies in honour of H. G. Widdowson* (pp. 125-44). Oxford: Oxford University Press.
- Swain, M., & Lapkin, S. (1995). Problems in output and the cognitive processes they generate: A step towards second language learning. *Applied Linguistics*, 16, 371-391.
- Tyler, I., & Tyler, M. (1990). *Psycholinguistics: Learning and using language*. Englewood Cliffs, NJ: Prentice-Hall.
- VanPatten, B. (1996). *Input processing and grammar instruction in second language acquisition*. Norwood, NJ: Ablex.
- Wingfield, A. (1993). Sentence processing. In J. Berko Gleason and Ratner, N. B. (Eds.), *Psycholinguistics* (pp. 199-235). Fort Worth: Harcourt Brace Jovanovich College.