

The Output Hypothesis: Its History and its Future

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Introduction

In the 1980s, the word “output” was used to indicate the outcome, or *product*, of the language acquisition device. Output was synonymous with “what the learner/system has learned”.

Outline

- the context in which the output hypothesis was proposed
- three functions of output, along with a description of some of the supporting research
- future directions

There has been a shift in meaning from the 80's to now from output being understood as a noun, a thing, a product to output being understood as a verb, an action, a process.

What is The Output Hypothesis?

The output hypothesis claims that the act of producing language (speaking or writing) constitutes, under certain circumstances, part of the process of second language learning.

Three functions of output in second language learning:

- 1) the noticing/triggering function
- 2) the hypothesis-testing function
- 3) the metalinguistic (reflective) function.

What was the context in which the output hypothesis was formulated?

Two aspects of the context that are important to mention.

1. The dominant theoretical paradigm for second language acquisition (SLA) research at that time (1980s): information-processing theory.

2. The widespread growth of French immersion programs in Canada, the evaluations of which were showing some rather unexpected findings.

Information-processing theory

In the early 1980's, the burgeoning field of SLA was dominated by the concept of input.

“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.”
(Krashen, 1984, p 61).

French immersion programs in Canada

- the French proficiency of the immersion students was more advanced than that of students taking 20 to 30 minutes a day of FSL.

- on some tests of French listening and reading comprehension, French immersion students obtained scores similar to those obtained by francophone students of the same age.

- to the surprise of some, the speaking and writing abilities of French immersion students were, in many ways, different from those of their French peers.

These latter findings raised doubts for me about the validity of the input hypothesis (Swain 1985), most particularly about the argument that comprehensible input was “the only true cause of second-language acquisition” (Krashen 1984: 61).

Alternative explanations were sought.

- One explanation, based on both informal and formal observations in immersion classrooms, was the output hypothesis (Swain 1985).

- Observations revealed that the immersion students did not talk as much in the French portion of the day (in French) as they did in the English portion of the day (in English) (Swain 1988).

- More importantly, the teachers did not “push” the students to talk in French in a manner that was grammatically accurate or sociolinguistically appropriate.

“...the meaning of ‘negotiating meaning’ needs to be extended beyond the usual sense of simply ‘getting one’s message across.’ 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 toward the delivery of a message that is not only conveyed, but that is conveyed precisely, coherently, and appropriately. Being ‘pushed’ in output...is a concept parallel to that of the $i + 1$ of comprehensible input. Indeed, one might call this the ‘comprehensible output’ hypothesis.”

(Swain, 1985, 248-9).

Mackey (2002) provides evidence of the reality of the notion of “pushed output”.

NNS: And in hand in hand have a bigger glass to see.

NS: It's err. You mean, something in his hand?

NNS: Like spectacle. For older person.

NS: Mmm, sorry I don't follow, it's what?

NNS: In hand have...he have...has a glass for looking through for make the print bigger to see, to see the print, for magnify.

NS: He has some glasses?

NNS: Magnify glasses...he has magnifying glass.

NS: Oh aha I see, a magnifying glass, right that's a good one, ok.

Stimulated recall of the learner as an instantiation of the perception of “being pushed”

“In this example I see I have to manage my err err expression because he does not understand me and I cannot think of exact word right then. I am thinking thinking it is nearly in my mind, thinking bigger and magnificate and eventually magnify. I know I see this word before but so I am sort of talking around around this word but he is forcing me to think harder, think harder for the correct word to give him so he can understand and so I was trying, I carry on talking until finally I get it, and when I say it, then he understand it, me.” (non-native speaker, excerpt b of example 3 in Mackey in 2002).

Mackey (2002) found a high degree of agreement between learners' perceptions and the researchers' interpretation that an interaction episode involved learners being pushed to make modifications in their output:

- 81.5% in student-teacher interaction in a classroom setting;
- 72% in NNS/NS interaction in a laboratory setting; and
- 64.5% in NNS/NNS interaction, also in a laboratory setting.

Conclusion

Students' perception of being "pushed" is highest when the feedback comes from the teacher and least when it comes from a non-native speaking peer.

The label “comprehensible output” tended to get in the way of the idea of output as process even though the 1985 formulation was clear that the output hypothesis was about what learners did when “pushed” – what processes they engaged in.

Two ways in which the “comprehensible output” label focussed research on the product of learning.

1. The label was taken literally, and out of context, so that “comprehensible” was taken by some (e.g. Van den Branden 1997) to mean just that – able to be understood – rather than output that was an improved version of an earlier version in terms of its informational content and/or its grammatical, sociolinguistic, or discourse features.

2. The label (a noun) put the focus on product, rather than on process. Much of the research (e.g. Pica, Holliday, Lewis, & Morgenthaler 1989; Pornpibul 2002; Shehadeh 1999; Van den Branden 1997) conducted in the late 1980s and 1990s about the output hypothesis was descriptive in nature, and tended to focus more on “occurrence than acquisition” (Shehadeh, 2002: 641).

The research demonstrated that learners often responded to negotiation moves such as requests for clarification with modified output. Instances of this modified output were counted and compared according to context and learner variables, for example;

- the type of task (e.g. Iwashita 1999)
- the type of negotiation move (e.g. Pica et al 1989) that generated it,
- gender of participants (e.g. Gass & Varonis 1986; Pica, Holliday, Lewis, Berducci & Newman 1991),
- proficiency level of participants (e.g. Shehadeh 1999).

Three functions of output:

- i) the noticing/triggering function. The claim here is that *while attempting to produce* the target language (vocally or silently (subvocally)), learners may notice that they do not know how to say (or write) precisely the meaning they wish to convey.

In other words, under some circumstances, *the activity of producing the target language* may prompt second language learners to recognize consciously some of their linguistic problems: it may bring their attention to something they need to discover about their second language (possibly directing their attention to relevant input).

- This awareness triggers cognitive processes that have been implicated in second language learning – ones in which learners generate linguistic knowledge which is new for them, or which consolidate their current existing knowledge (Swain and Lapkin 1995).

- The student has just written “*Il y a trop d'utilisation des chimiques toxiques qui détruisent l'ozone.*” (There's too much use of toxic chemicals which destroy the ozone layer).
- [2] *La dé...truc...tion. Et la destruction.* No, that's not a word. *Démolition, démolisson, démolition, démolition, destruction, détruision, détruision, la détruision des arbres au forêt de pluie* (the destruction of the trees in the rain forest).
- (from Swain & Lapkin 1995)

- **The final solution, “*la détruision*,” is not correct, but he has created this new form by making use of his knowledge of French: he used the stem of the verb he has just produced and added a French noun suffix.**

- **This example is revealing because it is an incorrect solution: it allows us to conclude that new knowledge has been created through a search of the learner's own existing knowledge, there being no other source. The learner's search was triggered by his own output, which he noticed was incorrect.**

- Learners may simply notice a form in the target language due to the frequency or salience of the feature (Gass 1997).

- Learners may notice that the target language form is different from their own usage (“noticing the gap”).

- Learners may notice that they cannot say what they want to say in the target language (Swain 1995). Noticing this “hole” (Doughty and Williams 1998) may be an important step to noticing the gap.

Izumi (2002) examined whether output promotes noticing and learning of English relativization (object-of-preposition (OPREP) type of relative clauses (RCs)) among adult ESL learners. Izumi wanted to know whether the act of producing the target language promoted the noticing AND learning of formal elements in relative clauses more so than did visually enhanced input.

The findings concerning acquisition were clear. The results revealed:

- a significant main effect for output
- no significant effect for input enhancement
- no significant interaction effect.

- Izumi concluded that the greater learning evidenced by the learners under the “output” conditions triggered deeper and more elaborate processing of the form, which led them to establish a more durable memory trace.” (p 570).

ii) the hypothesis testing

function. The claim here is that output may sometimes be, from the learner's perspective, a "trial run" reflecting their hypothesis of how to say (or write) their intent.

“I am thinking at that time why she say “really?” she understands me or does not agree me or does not like my grammar or my pronounce? So I try again with the answer she like to hear but I still try out suit, suit, I cannot get the correct word but I see in my picture, written in the door of the room and I think it is a name, name of this area. I say suit, suit, I was try it to see how I sound and what she will say, and she does not understand me. Sad for teacher...but I keep trying and here, here, she finally she gets my meaning, and she corrects me, and I see I am not I do not was not saying it in the correct way, it is suite suite and this sound better, sound correct, even to me.” (non-native speaker, excerpt b of example 4 in Mackey 2002)

- If learners were not testing hypotheses, then changes in their output would not be expected following feedback. However, research has shown that learners do modify their output in response to such conversational moves as clarification requests or confirmation checks.

- Recently, however, research has been directed at establishing whether the production of modified output facilitates L2 learning.

- An example: Loewen (2002) examined the occurrence, nature and effectiveness of incidental focus on form episodes (FFE) in communicatively-oriented classes.

- Teachers' reactions could be classified into those which provided the student with an answer (e.g. recasts) versus those which pushed the student to produce an answer (e.g. elicitation, clarification requests) (see also Lyster 1998). Uptake by the students could occur in either case.

- 32 hours of classroom interaction observed in 12 different ESL classes of young adults
- teacher recasts were the most frequent reactive response
- however, both uptake and *successful* uptake were more likely to occur in response to elicitation moves.

- **In other words, students were more likely to modify their output, and do so successfully, when they were pushed to do so.**

- important for students to actually produce the targeted linguistic items correctly, supporting the notion that in these cases the learners were actively seeking feedback through hypothesis testing.

**iii) metalinguistic (reflective)
function of output. The claim here is that using language to reflect on language produced by others or the self, mediates second language learning.**

- This idea originates with Vygotsky's sociocultural theory of mind. Sociocultural theory is about people operating with mediating tools (Wertsch 1985). Speaking is one such tool.

- In this context, I (Swain 2000; 2002; 2006) have re-labeled “output” as speaking, writing, collaborative dialogue, private speech, verbalizing, and/or languaging – in order to escape the inhibiting effect of the “conduit metaphor” implied in the use of terms such as input and output (Firth & Wagner 1997; Kramersch 1995; van Lier 2000).

- Stetsenko and Arievitch (1997: 161) state: “Psychological processes emerge first in collective behaviour, in co-operation with other people, and only subsequently become internalized as the individual’s own possessions.”

- This means that the dialogue learners engage in takes on new significance. In it, we can observe learners operating on linguistic data – operations that move inward to become part of the participants own mental activity. In dialogue with others, we see learning taking place (Donato & Lantolf 1990; Lantolf 2000a; Swain 2001).

- These claims provide a basis for having students work together – eventually students are expected to engage in solo mental functioning, and that solo mental functioning has its source in joint activities.

- In those joint activities language is used – used initially to externally and collaboratively mediate problem solution.

We (Swain & Lapkin 1995; 1998; in press a) have called this joint problem-solving dialogue, “collaborative dialogue”, which is “taken in”, so to speak, – re-created on the intramental, that is, the psychological plane – by the learner, and when this happens, it serves to mediate problem solution by the learner, him or herself.

Collaborative dialogue is thus dialogue in which speakers are engaged in problem-solving and knowledge-building/co-constructing knowledge – in the case of second language learners, solving **linguistic** problems and building/co-constructing knowledge **about language.**

- In our research (e.g. Kowal & Swain 1997; Swain 1998; Swain & Lapkin 1998; in press a; b), we have experimented with tasks which encourage students to engage in collaborative dialogue and found that tasks where students are asked to write something together tends to elicit collaborative dialogue as the students discuss how best to represent their intended meaning.

- Furthermore, we have shown through the use of post-test items based on the students' collaborative dialogues that the collaborative dialogues were a source of language learning.

- Speaking also completes thought.
- Vygotsky, Barnes (1992), Wells (1999), and others have argued that speech can serve as a means of development by reshaping experience.

- Speaking serves as a vehicle “through which thinking is articulated, transformed into an artifactual form, and [as such] is then available as a source of further reflection” (Smagorinsky 1998: 172), as an object about which questions can be raised and answers can be explored with others or with the self.

- As Smagorinsky (1998) says, “The process of rendering thinking into speech is not simply a matter of memory retrieval, but a process through which thinking reaches a new level of articulation.” (pp 172-3). Ideas are crystallized and sharpened, and inconsistencies become more obvious.

SR-S. [...] because I thought it meant
48: like he was going to. So he was
se lever, which means like in a
moment, not exactly right away.

SR-S. He's doing it and then he is doing it
58: again. Instead of just kind of uh he
did this and that and that, so it's a
better form of saying it by adding
the *se*. It's more French.

SR-R. Do you see a difference between the
73: two? (*se brosse les dents* and *brosse*
les dents)

SR-S. Uh...yeah, because when you say *se*
74: *brosse les dents*, it's kind of like um
he is brushing his teeth and then he's
gonna comb his hair. But when you
take off the *se*, it's like so he
brushed his teeth, combed his hair
and then kind of left.

SR-R. 77: [...] Why would you need *se*?

SR-S. 78: Um I think...I don't know. I don't really get why you do need *se*.

-Sue has talked herself into understanding that she doesn't understand the use of “*se*” in French.

- What Sue's verbalization has accomplished for her is two-fold:
 1. she has externalized her thinking,
 2. her externalized thinking provides her with an "object" on which to reflect.

To repeat, Sue's speaking was a tool through which her thinking was articulated and transformed into an artifactual form, and as such became available as a source of further reflection. She recognizes through the inconsistencies in her explanations, that she did not understand what this "se" is all about – a step that must surely be an important step for her language development to proceed.

- From a sociocultural perspective, producing language has vital and significant functions in second/foreign language learning and teaching which need to be explored in the future.

- Over the last few decades, there's been a shift in meaning from *output as product* to *output as process* – a shift that creates the need for some new metaphors, new research questions, and a new respect for our research tools.

- if verbalization has the impact I am suggesting on second language learning, then research tools such as think alouds and stimulated recalls, need to be understood as part of the learning process, not just as a medium of data collection (Smagorinsky 1998; Swain 2002).

- Think alouds and stimulated recalls are not, as some would have it, “brain dumps”; rather they are a process of comprehending and reshaping experience – **they are part of what constitutes learning.**

Sociocultural theory, then, puts language production in a “star role”. Speaking – and writing – are conceived of as cognitive tools:

- **tools that mediate internalization;**
- **tools that externalize internal psychological activity, RE-cognizing it for the individual;**
- **tools that construct and deconstruct knowledge; and**
- **tools that regulate and are regulated by human agency.**

FUTURE DIRECTIONS

Experimental studies within an information processing framework would seem particularly fruitful.

Investigation of the levels and types of processing that output, under different conditions, engenders seems to me to be a particularly interesting route to pursue.

- Within a sociocultural theory of mind framework, ethnographic and case study approaches would seem to be more valuable at this point in time, although there is certainly a place for experimental work.

- Particularly useful to understanding processes and strategies of second language learning will be studies of the collaborative dialogue and private speech of learners as they work to solve language-related problems they face in their language production, be they at the level of morphology, syntax, discourse, pragmatics, or conceptualization of ideas.

- By studying the collaborative dialogue and private speech of learners, according to a Vygotskian sociocultural theory of mind, we are observing learning in progress.

- Of considerable sociocultural interest are other broader questions about verbalizing/ languaging. For example, if verbalizing/ languaging is such an important cognitive tool, can its use help prevent memory loss?

Other important questions for the future include:

- What are the roles of languaging in distributing cognition.
- In what ways does the setting and context constrain or enhance learners' opportunities to language?

The most significant new understanding for me in studying the roles of the activity of producing language is just how very important it is as a cognitive tool – as a tool which mediates our thinking – an activity which I am now calling “linguaging**”.**

Collaborative dialogue and private speech are examples of languaging. My view is that the concept of languaging – of using language to mediate cognitively complex ideas – greatly widens our agenda for second and foreign language learning and teaching theory, research and practice.