

# *A Psycholinguistic Analysis of Spoken Language Production*

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**Abstract:** This paper explores the theme of spoken language production from first language speech production and Levelt's (1989) Speech Production Model. Then, second language production will be analyzed with second language acquisition and the spoken language constructs: Complexity, Accuracy, and Fluency (CAF). It is suggested that the CAF constructs can be references for education practitioners in their teaching practice.

## **1. Introduction**

This paper examines the theme “spoken language production”, a review will be conducted of the first language speech production and Levelt's (1989) Speech Production Model to view how language is produced<sup>[6]</sup>. Linked with this research context, the second language production will be analyzed with second language acquisition and the spoken language constructs: Complexity, Accuracy, and Fluency (CAF).

## **2. First Language (L1) Speech Production**

Language production is a psychological process in which language expresses ideas. By means of encoding the ideas, language and psychology, the sounds and words of a certain meaning are sent out by means of the articulator<sup>[17]</sup>.

Such psychological processes of spoken language production are regarded as a complex and multi-faceted production, which is explained by psycholinguistics through models ever since the 1970s<sup>[9]</sup>. In the fields of psycholinguistics, there are three influential and recognized models of L1 speech production: Fromkin's Serial Model, Dell's Parallel Model, and Levelt's Modular Speech Production Model<sup>[9]</sup>.

Fromkin (1973) has adopted a series of speech errors to observe the roles of language units in speech production<sup>[4]</sup>. Eight types of speech errors were summarized: transfer, exchange, advance, delay, increase, decrease, substitution, and combination. However, Fromkin's speech error analysis has indicated that speech production goes through many independent stages, which can make all levels of language production isolated. Furthermore, not enough evidence for speech errors in interpreting the unprepared speech was found<sup>[9]</sup>.

After Fromkin's serial model, Dell (1986) has proposed the parallel model, which is interactively

activated among semantics, syntax, morphology, and phonetics levels<sup>[2]</sup>. Dell's parallel model has assumed that all levels are operated at the same time<sup>[9]</sup>. Nevertheless, problems have existed in whether the activation of phonemic information in morphemes is simultaneous<sup>[18]</sup>. To prevent the simultaneous activation of phonemes between different syllables causing errors, Dell has proposed the so-called "binding by time" mechanism, which considers that phonemes are combined in turn with morphemes or syllables. Even so, experimental studies have shown that when speakers have multiple speech forms at the same time, they do not integrate the speech information, which results in errors<sup>[18]</sup>.

The last one, Levelt's (1989) modular speech production model, is based on decades of psycholinguistic research and many empirical studies, which is the most influential model of L1 speech production and the most widely used theoretical framework of speech production<sup>[6][9]</sup>. Therefore, Levelt's model will be chosen to view the language production process and later lead to the assumptions of Skehan's Limited Attentional Capacity model in this study.

#### *Levelt's (1989) Model of First Language (L1) Speech Production*

Levelt (1989) has proposed the information processing model of L1 speech production in three hierarchically modular stages: conceptualization, formulation, and articulation. The conceptualization stage is to develop and organize the ideas into a communicative goal<sup>[6]</sup>. Then, in the formulation stage, a phonetic plan is made for the content of speaking. Finally, articulation is created when the phonetic plan is transformed into the actual speech<sup>[3]</sup>. To scrutinize the L1 speech production process, the following figure can be referred to (Figure 1). In this figure, the L1 speech production involves several stages. For each stage, there will be some input and output. The output of one stage could be the input in another<sup>[7]</sup>. Based on the map in Figure 1, the 3 stages of this information process will be explicated.

#### *Conceptualization*

The first stage is conceptualization. In this stage, the speakers need to generate mental activities involving the conceptualization of speaking intentions before speaking. For such an intention, the speaker would need to decide what information is necessary to the speech, how the information should be ordered, and follow up with the expressions to realize the intention<sup>[7]</sup>. The mental activities of conceiving, planning, selecting, and monitoring are considered as the process of conceptualization. The output of this stage constitutes the preverbal message<sup>[7]</sup>.

#### *Formulation*

Moving to the formulation stage, the preverbal conceptualized messages are accepted as input. Then, those messages are transformed into the linguistic messages, which consist of two parts<sup>[7]</sup>. The first is grammatical encoding including the procedures of accessing lemmas (the basic form of a word) and the procedures of all the syntactic building (the way that words and phrases are put together to form sentences). Then, a surface structure, "an ordered string of lemmas grouped in phrases and subphrases of various kinds", will be produced by the grammatical encoder<sup>[7]</sup>. Based on the surface structure, the second part of the linguistic message, the phonological encoding is established with the plan of building the phonetic or articulatory utterance for the lemmas and forms. The output of the phonological encoding comes with a phonetic or articulatory plan<sup>[7]</sup>.

#### *Articulation*

The articulation stage, the end product, which is the phonetic or articulatory plan of the formulating stage, turns into the input of this stage. The phonetic plan is realized and delivered. In this execution stage, the internal speech of phonetic plan can be generated faster than the articulation<sup>[7]</sup>. Then, there is an articulation buffer as the temporary storage of the phonetic plan. The speakers can reclaim the phonetic plan from the buffer and deliver them in the articulation stage. The output of the articulation is called overt speech<sup>[7]</sup>.

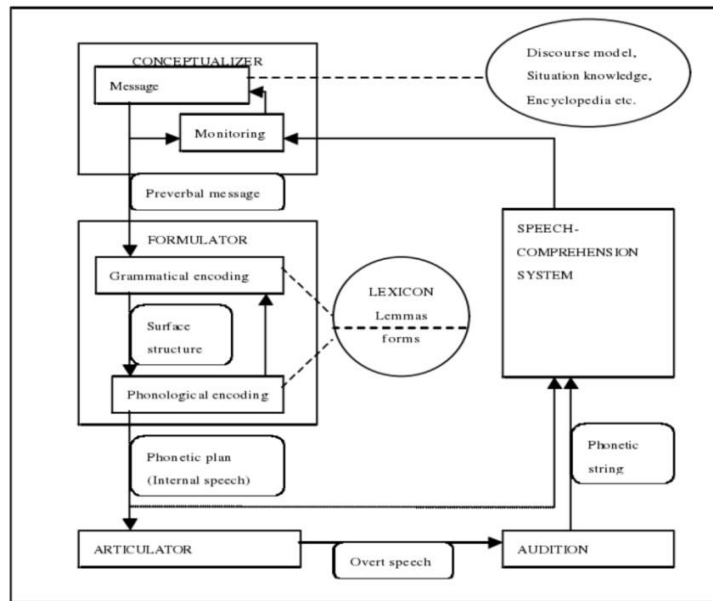


Figure 1: A Map for the First Language Speech Production Process

The above analysis concentrates on Levelt's model of L1 speech production. However, the context of this study focuses on second language speech production for students in a university of science and technology in China. Then, based on Levelt's model of the language production process, second language speech production will be scrutinized.

### 3. Second Language (L2) Speech Production

To fully understand the concepts of L2 production, first, the understanding of learners' second language acquisition (SLA) should be reviewed. In SLA, the scope and the origin of SLA research are analyzed. Then, the Input and Output Hypotheses are raised. Next, based on the Output Hypothesis, the triad constructs of complexity, accuracy, and fluency (CAF) are identified by Skehan (1999), which can serve as the measurements of L2 speech production<sup>[11]</sup>.

Unlike L1 production, L2 speech production, however, can be more demanding in the cognitive information process and the memory system, along with insufficient mental lexicons, the storage of "considerable information about each lemma and information", to support the natural and immediate L1 speech production<sup>[13]</sup>.

Therefore, in the process of L2 speech production, the information and memory system are cognitively challenging for L2 learners. The role of cognitive factors is more complex, because L2 speakers have different degrees of conceptualization and formulation (Levelt's model) for L2 language coding<sup>[16]</sup>. The pre-verbal message in the conceptualization stage is difficult to produce in L2 context. Meanwhile, the L2 speech formulation requires a conscious attention search mechanism to extract the appropriate lemma, cooperating with activated concepts, to complete the syntactic and lexical coding process<sup>[16]</sup>. With smaller, incomplete, less organized, and less redundantly structured mental lexicons, the formulation stage will be considerably difficult for L2 speakers to find ways and resources to express meanings<sup>[13]</sup>.

#### *The Scope of Second Language Acquisition (SLA)*

The scope of SLA begins with fundamental inquiries of how SLA occurs, which in other words, is how an L2 learner blend in the internalization of L2 linguistic system<sup>[15]</sup>. SLA researchers have diligently sought answers to which instructional efforts can promote L2 acquisition.

### *The Output Hypothesis*

Swain (1985) put forward the Output Hypothesis in SLA research, which suggested that language engaging in the syntactic process of learners could foster SLA [3][14]. From the output hypothesis, learners pay attention to the problems in their language system in the process of expressing meanings, which triggers the attention in the analysis of language form. The conscious attention to the language form constitutes the key link of the whole hypothesis [8]. Without conscious attention to the language form, it is impossible for learners to analyze their own language and produce the revised output for the internalization process of language knowledge and the improvement of L2 [8]. Therefore, it is indispensable for the attention and the notice function in the language output to promote SLA. During attentive noticing, the important premise for output is that the learners must have enough cognitive resources to pay attention to the form and meaning of language [8]. Thus, cognitive resources could impact on L2 output. In this study, the varied task characteristics and task conditions in the speech-making tasks can have different cognitive demands, which can influence learners' L2 production. Therefore, the cognitive perspectives influencing language output will be analyzed in the later sections. Additionally, second language production constructs will be identified first.

## 4. Second Language Production Constructs

Based on Swain's Output Hypothesis, the three perspectives of second language production have been distinguished by Skehan (1999)[11]. Complexity, accuracy, and fluency (CAF) have been viewed as the principal research variables of language production in L2 research [12]. However, to review the literature of the triads, the L2 pedagogy research can be traced back to the 1980s. Brumfit (1984) was one of the earliest researchers to identify the dichotomy between fluency-oriented activities and accuracy-oriented activities [1]. Later in the 1990s, Skehan (1989) introduced a third component of the triad, complexity, to form the CAF in the proficiency dimensions. Accuracy relates to the "degrees of deviations from a particular norm" [5][10]. Errors, compared with accuracy, is characterized as a deviation from the form [5]. Fluency is about the language proficiency of a person with characterization of ease, eloquence, and smoothness of speech or writing [5]. The last of the most ambiguous triad is complexity, which can be the properties of L2 performance and proficiency (L2 complexity) [5]. The three constructs, complexity, accuracy, and fluency are defined in Table 1, which will be used as the quantitative measures in this study.

Table 1: Definitions of Complexity, Accuracy, and Fluency [13]

Complexity	The capacity to use more advanced language, with the possibility that such language may not be controlled effectively. This may also involve a greater willingness to take risks, and use fewer controlled language subsystems.
Accuracy	The ability to avoid error in performance, possibly reflecting higher levels of control in language.
Fluency	The capacity to use language in real time, to emphasize meanings.

## 5. Conclusion

This paper explores the theme of spoken language production from first language speech production and Level's (1989) Speech Production Model [6]. Then, second language production has been analyzed with second language acquisition and the spoken language constructs: Complexity, Accuracy, and Fluency (CAF), which can be presented as a reference for education practitioners in their teaching practice.

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