
Establishment and Movement of Psycholinguistics

การกำเนิดและการพัฒนาภาษาศาสตร์จิตวิทยา

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Abstract

The present paper is aimed to illustrate the establishment and development of psycholinguistics. Psycholinguistics is a discipline, which linguistics and psychology are integrated. This paper will shed light to the beginning of this science since the early development of psycholinguistics, the influential theorists who had the impact on the development of psycholinguistics, and finally, the important movement in each period of history. The influential theorists who will be mentioned in this article are Wilhelm Wundt, Leonard Bloomfield, and Noam Chomsky. The influence of each theorist on the development of psycholinguistics will be revealed and discussed. Finally, the major developmental steps of modern psycholinguistics will be presented and discussed in four major periods as 1) Formative period, 2) Linguistic period, 3) Cognitive period, and 4) Cognitive science period or Psycholinguistic theory or Psycholinguistic reality. This paper will bring readers deeper understanding in the important and influential flow, which has the impact on modern psycholinguistics.

Keywords: establishment, development, psycholinguistics, period

บทคัดย่อ

บทความนี้มีวัตถุประสงค์เพื่อนำเสนอการกำเนิดและการพัฒนาภาษาศาสตร์จิตวิทยา ภาษาศาสตร์จิตวิทยาในฐานะศาสตร์ ซึ่งเป็นการบูรณาการของภาษาศาสตร์และจิตวิทยา บทความนี้นำเสนอการเริ่มต้นของภาษาศาสตร์จิตวิทยา ตั้งแต่การพัฒนาตั้งแต่ระยะแรกเริ่ม นักทฤษฎีผู้มีอิทธิพลต่อการพัฒนาภาษาศาสตร์จิตวิทยา และสุดท้ายการจำแนกช่วงเวลาที่สำคัญต่อการพัฒนาภาษาศาสตร์จิตวิทยา นักทฤษฎีผู้มีอิทธิพลในที่นี่ กล่าวถึง Wilhelm Wundt, Leonard Bloomfield, และ Noam Chomsky โดยอิทธิพลของแต่ละท่านต่อการพัฒนาศาสตร์นี้ จะถูกนำเสนอและอภิปราย สุดท้ายช่วงเวลาที่สำคัญต่อการพัฒนาภาษาศาสตร์จิตวิทยาถูกนำเสนอและอภิปราย เป็น 4 ระยะ ได้แก่ 1) ระยะเริ่มก่อตั้ง 2) ระยะภาษาศาสตร์ 3) ระยะปริชาน และ 4) ระยะทฤษฎีทางภาษาศาสตร์จิตวิทยา หรือ ความจริงทางภาษาศาสตร์จิตวิทยา บทความนี้ให้ความเข้าใจเชิงลึกแก่ผู้อ่านต่อกระแสที่มีความสำคัญและมีอิทธิพลต่อภาษาศาสตร์จิตวิทยาในยุคสมัยใหม่

คำสำคัญ: การกำเนิด, การพัฒนา, ภาษาศาสตร์จิตวิทยา, ระยะ

Introduction

Psycholinguistics is a discipline in which two fields as linguistics and psychology are integrated together in order to investigate both theoretical and empirical study of the mental aspects and skills related to language understanding and production and the acquisition of these skills (Blumenthal, 1970; Altman, 2001; Garnham, Garrod, & Sanford, 2006; Traxler, 2011). Harley (2005) stated that the main purpose of psycholinguistic research is to study the cognitive process underlying the language comprehension and production and the way of language comprehension and production are interacted from cultural environment. Whereas, in modern psycholinguistics, biology, neuroscience, cognitive science, language teaching and learning, and information theory are implemented to study language processing (Traxler, 2011).

In this paper, the mature disciplines involved in history of psycholinguistics will be explained and summarized in the first section in order to introduce how the psycholinguistics was developed and the influential theorists who had the impact on the development of psycholinguistics and also reveal the important movement in each period of history.

Mature Disciplines in the Beginning of Psycholinguistics

The first period of Psycholinguistics began in the early 1960s. In this section, the two mature disciplines which collaborate in the theories and interchange of both psychology and linguistics to psycholinguistics will be illustrated.

1 Two Early Mature Disciplines

In the beginning period of psycholinguistics, psycholinguistics is established from two pillars of disciplinary. That is the pillars of psychology and linguistics. Based on psychology study, language ability is a psychological phenomenon (Wundt, 1900). Whereas, language is a visible human behavior (Bloomfield, 1933) and language is an innate behavior, which requires specific mechanisms (Chomsky, 1959, 1968) in the aspect of linguistics. The disciplinary of psychology and linguistics collaborated in the early history of psycholinguistics as the scientific study of linguistic theory proposed by Wilhelm Wundt and Leonard Bloomfield and linguistic theory which launched psycholinguistic enterprise by Noam Chomsky.

1.1 Wilhelm Wundt

Wilhelm Wundt (1832-1920) is a German professor who was trained in experimental psychology and known today as one of the founding figures of modern psychology. He is known as the “*father of experimental psychology*” (Boring, 1950). Wundt looked at language as the result of psychological processes and the study of language could provide important insights into the nature of mind. In 1879, Wundt founded the first institute of experimental psychology in Leipzig, where scientific psychology emerged with the development of the first psychological laboratory. In addition, this institute is the important beginning of a number of Wundt’s works (Danziger, 1979, 1990).

Part of Wundt’s works provided a prominent contribution to theories of psycholinguistics and linguistics. Regarding to Wundt’s psychological theories, language is an important part of his work. One of the earliest psychological accounts of language was shown in Wundt’s voluminous *Völkerpsychologie. Eine*

Untersuchung der Entwicklungsgesetze von Sprache, Mythos und Sitte (1900) named *Die Sprache* (1900) introduced his ten-volume of *Völkerpsych.*

During this period of Wundt's works (1832-1920), Wundt had both impact on psychology and psycholinguistics. Wundt's psychological principles allow the derivation with the other fields, including linguistic principles. There is strong influence of Wundt on psychology study of language. Wundt's influence was also observed in the following the other theorists' work and proposed by the later works concerning psycholinguistics such as Hermann Paul (1846-1921) in the work named *Prinzipien der Sprachgeschichte* (Niemeyer, 1909,1995), which putting his work with respect to Wundt's notion.

1.2 Leonard Bloomfield

Leonard Bloomfield (1887-1949) was one of the most important representatives of American structuralism and he was a major influential person who changed the perspective of linguistics from the historical and comparative study of languages in the 19th century to the language description of grammar in the 20th century. (Hall, 1970) p.549 considered Bloomfield as "was the first to demonstrate the possibility and to exemplify the means of a unified *scientific approach* to all aspects of linguistic analysis".

Bloomfield's scientific approach on the study of language were illustrated in his main book *Language* published firstly in 1933, which includes the subjects such as a physicalist and behaviorist conception of language; descriptive and synchronic linguistics of phonology, meaning, lexicon, and grammar, with syntax and morphology, and practical applications of linguistic knowledge (Hall, 1970).

Leonard Bloomfield (1887-1949) as one of the pioneers who implements scientific and behaviorism approach in linguistics, Bloomfield denied the application of evidences that cannot be directly observed for linguistic analysis. Regarding to Bloomfield (1887-1949), a behaviorist view of language was adopted. Bloomfield proposed that linguistic study must start from form not meaning as an opposition to mentalistic subjective interpretation of meaning. On the other words, Bloomfield's behaviorism approach emphasizes that the conception of language must be represented as visible and measurable behavior as a set of stimuli and reactions that occur in certain situations, not mental image. One of the examples of Bloomfield's implementing scientific and behaviorism approach in linguistics is that he concerns in analyzing formal features of language in order to get the conclusions. Bloomfield also points out that linguistics should have a similar character to the natural sciences, which explicitly considers an epistemological model (Robins, 1988, 1997; Murray, 1999).

1.3 Noam Chomsky

Noam Chomsky is an American linguist and one of the founders of the field of cognitive science. The role of linguists in Psycholinguistics was motivated by Chomsky's work in linguistics, and by his assumption that language has special properties, which a specific mechanism is required to handle it. Chomsky's works (e.g. Chomsky, 1957, 1959, 1969, 1981, 1985) became one of important movements in Psycholinguistics in the early to mid-1960s and this movement is called "*the Chomskian revolution*" (Bracken, 1973; Koerner, 1983).

Chomsky proposed the theoretical explanation of language, and specifically its structures. He proposed that language structures as an entity could be studied independently of the speakers that produced it, the purpose that it served, or the world within which it was acquired and used (e.g. Chomsky, 1957, 1959, 1969, 1981, 1985).

Chomsky, American theoretical linguist, whose work from the 1950s revolutionized the field of linguistics. Based on Chomsky's works, linguistics is a branch of cognitive psychology, which is aimed to provide understandings of mental processing and human nature. Chomsky's a universal grammar was a direct challenge to the behaviorist theories (e.g. Bloomfield, 1933) and had major contribution to explain how language is learned by children and what the ability to use language is (Lohndal, & Lasnik, 2013; Lasnik, & Lohndal, 2017).

According to Chomsky's theory (1968), he concentrated on issues of the innate structure operation and development for syntax capable of creative language ability. Chomsky proposed his point of view that scientific evidences of language behavior obtained from the studies in animals are not enough to provide the implication to human language behavior (Palmer, 2006) because of restricting to the evidences of external communicative conditions. Regarding to Chomsky's argument, the examples of children's language acquisition were raised. Chomsky gave a notification that young children can quickly develop their ability to create grammatical sentences, and also show the universally creative language use of native language competence. Thus, Chomsky provides an assumption that language is the product of universal innate ability, which he named it as "*Universal Grammar*". This assumption is contrary to the assumption proposed by Skinner's behaviorism approach (Chomsky, 2012; Cook & Newson, 2007).

Chomsky's argument of Skinner's behavioural approach paved the direction for the "*cognitive revolution*". With the influence of Chomskian revolution, the psycholinguistic research in the early period 1960s focused on investigation of the *psychological reality* of linguistic theories proposed by linguists with a purpose to examine the reality of linguistic theories occurring in speakers' and hearers' minds. During the Chomskian revolution, the connections between psychology and linguistics were particularly closed, especially in the area of syntax, in which the psychological reality of various proposed linguistic rules was tested.

Major Movement of Psycholinguistics

This section will present the classification of developmental steps proposed by (Maclay, 1973). According to (Maclay, 1973), the development of modern psycholinguistics can be divided in four major periods as 1) Formative period, 2) Linguistic period, 3) Cognitive period, and 4) Cognitive science period or Psycholinguistic theory or Psycholinguistic reality. The characteristics of each period, including the important movement obtained from each period will be presented in this section.

1 Formative Period

The first formal contacts between linguistics and psychology were established at a meeting of Social Science Research Council at Cornell in 1951. From this meeting, a committee on Linguistics and Psychology was set up. This is the first period in which a symmetrical relationship between linguistics and psychology, which is boosted. This period, structuralism was the influential paradigm in linguistics and behaviorism was predominant in psychology. Thus, both linguistics and psychology were committed to a behaviorism methodology, which constructs theory from observable data by using a set of verifiable operations.

In this period, psycholinguistics were interested to investigate the following issues of how humans comprehend language, how humans produce language, how and under what circumstances humans lose language, how a particular language affects cognition, the relationship between the first and foreign language learning, and how mother tongue interference is.

2 Linguistic Period

During this period, psycholinguistics was based on the notion of generative grammar in order to study language understanding. The primary starting point of psycholinguistics was the study of competence and the study of performance as a secondary activity. It was agreed that providing an understanding of speakers' competence is crucial to understanding the nature of speakers' actual performance. During this period, most psycholinguistic experiments were conducted to investigate the understanding and use of sentences. Based on the key concept of transformational generative grammar, the sentence has an important role to define the data and dimensions of grammar.

The important examples were from George A. Miller (1920-2012), American psychologist who was one of the founders of cognitive psychology and of cognitive neuroscience. His writings and experiments made significant contributions to psycholinguistics and the study of human communication. His works were known as a bridge between linguistic theory and psychological experimentation. His first book entitled *Language and Communication* was published in 1951, is popularly considered as a foundational work in psycholinguistics.

Miller also conducted some of the experiments to examine how people understand words and sentences on the basis of computer speech-recognition technology. He wrote a book named *Plans and the Structure of Behavior* (1960) with Eugene Galanter and Karl H. Pribram. This was an effort of using psychological research on how humans initiate languages to synthesize artificial intelligence research. Another well know work of George A. Miller is the development of *WordNet*, which began in 1986. WordNet was an electronic reference databank, which was designed based on psycholinguistic theories of human lexical memory.

In conclusion, linguistic period slowly promoted a more interdisciplinary in psycholinguistics. The study of psycholinguistics are the integrative disciplinary rather in the formative period.

3 Cognitive Period

During this period, the major influence is a cognitive approach, which is the dependence of language upon human cognition. Language is one of several fundamental cognitive process outcomes.

Psycholinguistics was completely independent of linguistics as a branch of cognitive psychology. The psycholinguistic research in this period investigated language from the perspective of cognitive psychology. The best early representatives of the cognitive approach in Psycholinguistics are Thomas G. Bever (born 1939) and Dan Isaac Slobin (born 1939).

Thomas G. Bever (1939-Present) is a Professor of Psychology, Linguistics, Cognitive Science, and Neuroscience at the University of Arizona. His research has two primary directions as applied and theoretical disciplinary. His research focuses on the perennial issues as the source of linguistic universals which is critical to the study of grammar. His study of linguistic universal (Bever, 2009, 2013; Medeiros, Piattelli-Palmarini, & Bever, 2016) also leads to more detailed analysis of topics distant from linguistics such as cognitive process differences among groups of people with different characteristics (e.g. Ross, & Bever , 2004; Bever, 2009), the visual computational process nature comprising the evolved biological substrate for language, and the components of abstract knowledge (e.g. Hauser, & Bever, 2008). These examples of previous works conducted by Bever and colleagues are the attempt to reveal the true linguistic universals.

According to applied linguistics and cognitive science, Bever's work is aimed to apply linguistics and cognitive science to improve the human language uses. He believes that the practical problems can be solved with the insights from recent linguistics, psycholinguistics, and cognitive science (e.g. Townsend, & Bever, 2001; Bever, 2013; Bartoli, D'Ausilio, Berry, Badino, Bever, & Fadiga, 2015).

Dan I. Slobin (1939 - Present) is a Professor Emeritus of psychology and linguistics, the University of California, Berkeley. He made important contributions to children's language acquisition study and his work also illustrated the importance of cross-linguistic comparison on the studies of language acquisition and psycholinguistics in general. The example of Slobin's work is his cross-linguistic research on investigating the information organization of spatial relations and motion events obtained in children and adults speakers of different languages (Slobin, 1986a, 1986b; Slobin, Iraide Ibarretxe-Antuñano, Anetta Kopecka, & Asifa Majid, 2014). According to the results of this study, he argued that in order to become a competent speaker of any language, a competent speaker has to learn certain language-specific modes of thinking or "*thinking for speaking*" (Slobin, 1996, 2014). Regarding to the notion of "*thinking for speaking*", he claimed that the way we perceive and think about reality was shaped by the language, which we have learnt. Another example of Slobin's work was a research study with Bever, T.G. entitled *The children use canonical sentence schemas: A cross linguistic study of word order and inflections* in 1982. In this study, *the subjects were monolingual children who resided in Berkeley, Rome, Dubrovnik, Istanbul, and Ankara. They were aged between 2-4 years old and spoke one of these four different languages as English, which is the representative of order and uninflectional languages; Italian, weakly ordered and weakly inflectional; Serbo-*

Croatian, weakly order and inflectional; and Turkish, minimally ordered and inflectional. The results were summarized that children prepared to learn both inflectional and word-order languages.

Additionally, during the 1980s, psycholinguistics includes the study of children's acquisition of language, the first and other language learning (e.g. Clark, & Clark, 1977; Slobin, 2006; Lemmens & Slobin, 2008) and also linguistic disabilities (e.g. Garnham, 1985; Slobin, 2015).

There were three main questions of psycholinguistics research within this period as:

(a) The study of interrelation between psychology and linguistics in mental representations and language processing.

(b) The study of the language processing processes which speakers' mental representation transformed a process into another. In this period, the study of processing in each level of language was largely conducted and explained by different models such as interactive activation (McClelland, & Rumelhart, 1981) and Connectionist models (Rumelhart, & McClelland, 1986).

(c) The study of overall language processing in which each level of language processing interact to the other levels. For example, according to the interactionist position, language processing in each level is distinct representational domains such as phonological and orthographic word forms, syntax, semantics; however, these all interact with each other during processing. Thus, higher levels of processing can influence lower levels before processing at the lower levels is complete.

4 Psycholinguistics Theory Period

A state of transition of psycholinguistics development started in the 1980s. That is no longer any one single discipline of thought, nor is psychology or linguistics, prevailed in the psycholinguistics. Furthermore, with the impact of cognitive science in the previous period, it was shown that psycholinguistics can be investigated as the scientific understanding of how the human mind involves to language works. This supported that psychological reality can be examined scientifically in psycholinguistic theory and is necessary for a realistic and well-formulated theory of language, which is more a feature of this period than of the previous three periods. Presently, psycholinguistics is the integrating between cognitive psychology and linguistics. However, Psycholinguistics does not base on neither linguistics nor cognitive psychology. It has become an interdisciplinary field.

Psycholinguistics is currently involved in a larger field to examine the nature of knowledge of the mental representation structures, and how these are used in mental process. Language is seen as a symbolic process, often leading to language processing in both comprehension and production. In this period, psycholinguistic research had a contribution to a realistic science of the human mind. Psycholinguistics is truly an interdisciplinary field. Hence, it is studied with different disciplinary such as psychology, cognitive science, linguistics, computer sciences, and speech and language pathology (Fernandez, 2017; Duffield, 2018).

Conclusions

Psycholinguistics is a discipline in which linguistics and psychology are integrated with the aim of studying the mental aspects and skills related to language understanding and production, and the acquisition of these skills. In addition, study and research in psycholinguistics provide both theoretical and empirical resources for human experimental psychology, and knowledge related to the structure of languages offered by linguistics (Altman, 2001, 2006).

Based on the history and development of psycholinguistics, two mature disciplines took on important roles in the early history of psychological study of language. These two disciplines are *the scientific study of linguistic theory* proposed by Wilhelm Wundt (psychologist) and Leonard Bloomfield (linguist, behaviorism), and *linguistic theory* which launched the psycholinguistic enterprise of Noam Chomsky (linguist). The development steps of modern psycholinguistics (Maclay, 1973) are classified into four major periods: 1) Formative period, 2) Linguistic period, 3) Cognitive period, and 4) Cognitive science period (or Psycholinguistic theory, or Psycholinguistic reality). Each period of modern psycholinguistics development represents a significant advancement of the psycholinguistics field, culminating in the present situation in which psycholinguistics is examined and utilized as an interdisciplinary field of research and practice.

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