

History of Psycholinguistics

source: J.F. Kess (1992)

- Any or every discipline has a history behind its development and the stages of development actually entail the contributions of the great minds that have shaped the discipline and in this regard Psycholinguistics or Neurolinguistics is no exception.
- The first such name that must be taken with all due respect is that of Morris(1938). He is the first to study the interrelationship between the **signs and symbols as well as language and thought.**
- What is known as his **logical positivistic division** of the study of signs and symbols can be listed as the following fields of activity:
 - Syntactic = the relationship of signs to signs
 - Semantic= the relationship of signs to their meanings
 - Pragmatic= the relationship of signs to the people who use them

- Some thirty years later, Miller(1964) also used this logico-philosophical frame of reference in order to explain a linguistic-based approach to psycholinguistics.
 - He opined that such a classification of the field into problems of structure, of comprehension, of a collaboration of relevant disciplines such as linguistics, psychology and philosophy was very much needed in the present time.
1. *Syntax or problems of structure: at the lowest level, it is necessary to understand the syntactic structure of a language.*
 2. *Semantics or problems of comprehension: after this level, it becomes possible to understand its semantic content.*
 3. *Pragmatics or problems of belief: once both structural analysis and semantic comprehension are achieved, an understanding of pragmatic acceptance or rejection, and belief or disbelief is possible.*

Miller thought that this division would correspond roughly to the order in which the study of language has progressed.

This seemed true at that time and it seems quite appealing even in modern times too but not in the way Miller had envisioned it.

It is, however, still true, as he suggested, that syntactic is the best known, semantics is next best known and pragmatics is the least known activities with regard to the processing of the language by the human mind.

It might be true that Miller's classification of the ways language is processed by the mind does not meet the standard of modern research in the field, however, at the time when he made this division, the three fields could be allocated between the disciplines as follows:

1. *Psychology was traditionally interested in pragmatics, the psychologists were trying to understand the ways in which human beings acquire, understand and exploit the linguistic system.*
 2. *Semantics was traditionally interested in philosophy and later in the anthropology.*
 3. *Syntax was traditionally interested in linguistics, with its analysis of the formal relationship of signs to one another.*
- Miller was trying to attempt to demonstrate the importance of theoretical insights that were derived from linguistics to psycholinguistics. He, therefore, must be given the credit for his effort.
 - However, things have changed a lot in modern times, as we do not seem to make distinction between the theories of language and the theories of language users.
 - Also we do not see the fields neatly broken into linguistics and psychology, where linguists are just doing syntactic analysis and psychologists describing how human acquire and use that system.

- Changes have also occurred in the very definitions of what syntax, semantics and pragmatics and these changes have reflected in the interest of the researchers in these fields.
- Psychologists are more aware of problems of the structure and the meaning of the sentences in their research plans and linguists are well alert about the users and acquirers of language in constructing their theories of language.
- However, Miller's comments are best understood in the context of the **Linguistic Period of psycholinguistics**.
- His comments arrested the attention of the psychologists that they must pay attention to the structure of the language at the time of making the theories of language users and they must answer the question as to how the users deal with syntactic and semantic aspects of language, with the realities of structures and meaning derived from the language itself.

Since many researchers take these things for granted and new signposts have been erected in the field giving directions to where we should go and why, it is important to hold on for a second to see how we have come up to this stage and therefore we must examine the historical development of the field first.

Periods of Development in Psycholinguistics

- Names that are again important:
- Wilhelm Wundt= brought psycholinguistics out of Romanticist evaluation of language and was keen to show that language could be explained on the basis of psychological principles.
- Leonard Bloomfield= known as prototypical structuralist attempted in (1914) to pay careful homage to Wundtian psychology.
- Noam Chomsky= started the enterprise of ‘TG-Grammar’ and proposed the ‘innateness principle’ which helped the psycholinguists to achieve a new dimension altogether.
- Finally, updating Maclay’s useful (1973) classification of developmental steps in modern psycholinguistics, we can trace the field’s progression in four major periods:
 - 1. Formative period
 - 2. Linguistic Period
 - 3. Cognitive Period
 - 4. Cognitive Science Period or Psycholinguistics theory or Psychological Reality

- **Formative period:** The formative period in psycholinguistics is known for its **amazing symmetrical relationship** that it started between linguistics and psycholinguistics.
- This is so because researchers in both the fields were committed to an operationalist philosophy: this operationalist could be understood with structuralism being the prevailing paradigm in linguistics and behaviorism dominating psychology.
- An operationalist approach in philosophy of science requires the researchers to **construct any theoretical claim** on the basis of **observable data** and by using **a set of verifiable operations** which are **highly explicit** or **self explanatory**.
- This is what structuralist in linguistics were doing and trying to define the linguistic units like phoneme and morpheme in terms of operational procedures.
- For example, linguists used the concepts like ‘minimal pair’ or ‘complementary distribution’ to define a given phoneme.
- These operational procedures were called ‘discovery procedures’ and were used in interviewing language consultants in field-work to ‘discover’ the structure of an unknown or even familiar language.

- Similar emphasis to the observable data was given by the behaviorists in psychology.
- It was demanded that efforts should be put to make the theoretical claim valid by ensuring the elaboration of operational methods
- As only this could guarantee that the explanatory device adopted to analyze the data was based on real world experience or situation.
- Behaviorist methodology thus started giving emphasis on rigorous experimental design and statistical analysis of the data.
- It must be noted that the emphasis on good experimental design and statistical analysis of the resultant data continued to be the hallmark of mainstream psychology before any psychological investigation could be carried out.
- And method dominated the discipline regardless of the paradigm that was adopted for the investigation or study.

- There was a third partner that is being reported to be the part of Formative period and it is known as ‘Information theory’.
- This theory was derived from communication engineering and it served largely as a source of ideas and models.
- For example, Shannon and Weaver (1949) who worked as communication engineers with Bell Telephone, defined a ‘communication’ unit as follows:
- **Source Transmitter/encoder-> Channel-> Receiver/decoder->Destination**
- The channel might be subject to interference or ‘noise’ and this was a prime concern for communications engineers at that time.
- So, the emphasis was put on decoder and encoder on opposite ends of the channel.
- It was also ensured that attention must be put to the possible interference that channel might be encountered with.
- Information theory and by extension, psycholinguistics, made use of this mechanical metaphor for language processing for a brief period of time in the 1950s.

- As an example how psycholinguistics made use of this system of ‘communicating units’ for language where producing/encoding and comprehending/decoding messages took place can be understood from Osgood and Scheek(1954) comment that states ‘..psycholinguistics deals directly with the processes of encoding and decoding as they relate states (stages) of messages to the states (stages) of communicators’.
- There seems to be some disagreement amongst the scholars as to who did what in psycholinguistics. However, it is very much evident that some kind of division of labor did exist between the two interrelated fields.
- The linguists were quite busy in analyzing the states/stages of message in their area of research inquiry and the psychologists took interest in the states of communicators.
- The process of encoding and decoding remained in the hands of **Information theory** and the interest of communication engineers got into the realm of psychology because of the natural affinity that it had with behaviorism.

- **Linguistic Period:** The advent of TG-Grammar in linguistics has had its own effects in the theoretical domination in psycholinguistics research during 1960 to 1970 (even later).
- Chomsky's criticism of behaviorism came to dictate the shape of psycholinguistic research.
- Chomsky almost put to an end the two cornerstones of psycholinguistic research which had served the formative period.
- His main argument was that an operationalist philosophy can not provide adequate explanation to the grammar of any natural language.
- He argued for a deductive approach in linguistic research and advocated for the study of competence of the language than the performance.
- He emphasized that the competence of the user for languages should be the main concern for a linguistic analysis.
- Thus, the claim about the division of labor that was the sole basis of 'formative period' was called into question and theoretical assumptions were rebuked.
- In linguistics, this period came to indicate a shift in the 'paradigm' but in psycholinguistics this was really the introduction of ONE where there was NONE.

- In this changed scenario, a psycholinguistic research, based on what the generativists thought to be crucial was the study of competence than the study of the performance.
- So, the centrality of grammar was considered the basic assumption, with the sentence emerging as the prime unit in this quest to understand the processing of the language.
- Therefore, most of the psycholinguistic experiments during this period gave emphasis on the analysis and use of the sentences as they played such an important role in defining the data and dimensions of TG-grammar.
- George Miller was the initiator of this exercise. Most of the researches in this period started embodying the centrality of the grammar and thus many researches started coming up with titles such as '*Some Psychological Studies of Grammar* (Miller 1962)' and '*Some Perceptual Consequences of Linguistic Rules* (Miller and Isard 1963) etc.

- Having accepted the centrality of the grammar and its rules that played an important role in the grammatical description of the language, the psycholinguistic researches wanted to test whether such linguistic rules of grammar were involved in language comprehension.
- They also wanted to test whether the number and complexity of mental operations performed during language processing had to do anything with the number and complexity of the formal rules prescribed in TG-grammar for the grammatical derivation of the sentences.
- [Example of number and complexity](#)
- This notion came to be known as ‘**Derivational Theory of Complexity**’ in Psycholinguistics.
- This idea, of course, was not supported either by the originator, Chomsky or the practitioners of the TG-grammar.
- But much of the information which experimental results demonstrated along the way was even more informative, and showed that there was much more to be learned from Psycholinguistic research than just treating this as a weak hypothesis.

One of the good things that happened in this period, despite the clashes of interests between the researchers of the two disciplines, was the considerable interest in language acquisition in psycholinguistics.

Smith and Miller (1970) and McNell's (1966, 70) writings in developmental psycholinguistics whole-heartedly accepted the transformational approach.

They opined that the child enters the process of language learning with an innate predisposition for the general form of linguistic rules and possibly even certain linguistic categories.

Lennenberg (1967) being inspired by Chomsky's theoretical position of innateness hypothesis and generative grammar, supported the claim and gave it a full bloom.

The basic argument is that the capacity for language acquisition is species-specific and is a genetically determined attribute of human and human alone.

This gave the birth of a fully developed branch of psycholinguistics which is known as 'Developmental Psycholinguistics'.

With the insights being achieved from this endeavor of language acquisition, linguistic period paved the ways of a richer and more interdisciplinary commitment in psycholinguistics which later came to be known as 'Cognitive Period'.

One of the reasons for the set back of linguist period was the rapid pace with which the formalizations changed in linguistic theory, and this burdened even the committed psychologists and even the linguists desperately kept trying to keep the pace and the track, but the change was just too fast to catch up in many applied areas of linguistics.

There were of course the practical problems as well such as the role of performance facts, the difficulties for the inclusion of semantics in syntax and many other such problems with regard to the acquisition of language and its stages.

These problems might have given the way to the upcoming stage we just mentioned, however, linguistic period did not end abruptly nor it stopped influencing the research in psycholinguistics.

But a mad marathon which has started in the period in terms of grammatical models and methodologies from generative paradigm was certainly rejected on its face value.

Cognitive Period: Fodor (1966) and Lenneberg (1967) were the ones who started the movement.

The sole basis to advocate for the cognitive approach to the language processing is the **dependence of language upon human cognition**.

Researchers believed in the notion that language is nothing but one of the several outcomes of more fundamental cognitive processes.

Even Chomsky(1968) had supported the fact by calling the linguists as the cognitive psychologists.

However, Bever (1970) and Slobin (1973) were more vocal about the approach.

They rejected the centrality and independence of the grammar and argued that the cognitive capacity that is being described by the grammatical rules for the purpose of competence is the only manifestation of human language.

And this is in no way prior to or independent of other cognitive and behavioral systems that are involved in the processing of the language (either production or acquisition).

- They opined that linguistic structures are not learned independent of semantic concepts and discourse functions.
- And the acquisition of language was explained as a result of the interaction between the linguistic and other behavioral systems.
- Some researchers spoke to this extent that they claimed the TG-grammar itself just as a theory about having linguistic intuitions.
- The implication was that this type of language behavior is no more closely related to the ultimate nature of language than the other linguistic aspects of learning, perceiving and speaking.
- Thus, the role of the linguistic structure and that of the grammatical rules were denied the priority over the other cognitive processes.
- This was the dominant belief in ‘cognitive period’ despite the fact that ‘linguistic period’ continued to play an important role in psycholinguistic theory and practice.

Psycholinguistic theory, Psychological reality, and Cognitive science

- As has been pointed out by Rieber and Voyat (1981), Psycholinguistics is in a state of transition, and thus there is no one single school of thought that prevails in the discipline.
- If we examine the statement carefully, we would land up saying same thing about Psychology and Linguistics and many other disciplines too.
- What is true in modern times, is the tremendous amount of interdisciplinary activities everywhere.
- As we saw that once the centrality of the grammar was refuted by the researchers in Psycholinguistics during Cognitive period, the demand for the ‘psychological reality’ under scientific standards in psycholinguistic theory was no longer a novel issue (Johnson – Laird 1983)
- In the search for the ‘psychological reality’, the grammatical rules were not treated any special but part of other cognitive processes.
- The correctness of any grammatical theory was no longer the quest because every grammatical theory was demanded to be intrinsically correct.

- Rather, the quest in this period was for the usefulness or compatibility of a system of grammatical description that can be used in psycholinguistic research.
- It was claimed that ‘psychological reality’ is a term that must be reserved for that grammar ONLY which have the relevance to language processing.
- This set-standard, of course, created problems for linguists as many of them did not wish psychological validity for their theory, many did it very explicitly and some were trying very desperately, but in vain.
- However, it was the call for the day and ‘psychological reality’ served as an essential requirement for any linguistic theory which truly demanded the explanatory power about the nature of language beyond the linguistic system itself.
- One such attempt to integrate linguistic or psycholinguistic information into a single theory of language is found in what is known as LEXICAL-FUNCTIONAL GRAMMAR acronym-ed as LFG (Bresnan 1981, Bresnan and Kaplan 1982, Kaplan and Bresnan 1982).

Bresnan (1978) made a claim that her grammatical postulates are not only meant to be but are psychologically real.

LFG simply stores grammatical information directly in the lexical entry, assuming that it is easier to retrieve lexical information from the memory rather than grammatical permutation like TG rules which can change the syntactic format of sentences.

It is also sensitive to the well-established fact that we remember the semantic gist of the sentences and discourse requirement for them rather than their mere actual syntactic formats.

In one line this theory of grammar either avoided or overcome the problems that TG grammar could never solve.

At this stage it is important to talk about the contribution of Winograd (1983).

If one accepts his clever portrayal of 'Paradigm shift' in linguistics as a series of metaphors from the successful paradigms in the HARD SCIENCE, it is easy to see how this shift happened in psycholinguistics.

Paradigm shift in Psycholinguistics:

- In past, Darwinian evolutionary theory matched with ‘linguistics as biology’, with much attention paid to language change and defining families of languages.
- In the previous century, the taxonomic orientation of structuralism wanted ‘language or linguistics’ to be similar to ‘chemistry’, where one discovers the units of language structure such as phonemes, morphemes etc. as the scientists discovered the units of atoms or other elements.
- In the fifties of the century, Chomsky’s generative grammar wanted to view ‘language as mathematics’.
- The mode of inquiry was deductive, the goal was to understand the competence, and thus a highly abstract characterization of the knowledge of language on the basis of the mathematical symbols was proposed.
- But in this century, the models and metaphors come from elsewhere else. Linguistics as well as Psycholinguistics, having been influenced very much by the power and usefulness of the mechanical devices in the field of language processing, the fourth paradigm demands ‘language to be compared with computers’.

- The computational paradigm is after all the final basis to check the ‘psychological reality’ of any grammatical theory’.
- Language is now seen as a symbolic representation and processing and enabling the making of the decisions by the machine i.e. computers on the basis of the knowledge of grammar created for and by AI.
- In case of the human being, processing of this knowledge of language is helped by the mind and in case of the computer, it is the ‘programmed’ input knowledge that should help the computer to parse the correct form of the symbolic representation of the natural language = artificial intelligence.
- Now, we can understand the statement that the discipline (Psycholinguistics) is in a transition period of intellectual growth and reorientation toward issues in Cognitive Science.

That's all 😊

Rules for Passive in English:

- 1. The first very rule in English to transform an Active to Passive is that the verb must be a transitive one in the clause.
 - 2. Change the positions of the subject and the object.
 - 3. The verb of the sentence, having been changed to its V1 form first, must be transformed into V3.
 - 4. We must introduce a BE verb after the changed place of the Obj as the Subj of the passive.
 - 5. This Be verb must be given the left over TENSE marker of the original verb of the clause and should agree with the changed Obj that is the subj of the passive sentence.
 - 6. We can insert or place (optional, though) a BY phrase before the Obj of the Passive sentence.
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