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The Language of Thought: Myths and Facts

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Abstract

Throughout the years, philosophers and psychologists have striven to solve the mind-boggling question of learning by juxtaposing the two competing theories, namely, empiricism and rationalism. They have usually opted for one and ruled out the other on the grounds that it cannot account for learning because theoretical and empirical evidence discredits it. Since 1965, with the publication of Chomsky's *Aspects of the Theory of Syntax* in which, he explicitly introduces the notion of *Universal Grammar* and implicitly employs the term to support Fodor's philosophical view of learning in terms of 'language of thought', the rationalistic arguments seem to have taken over this never-ending and perpetual battle. Here in this article, it is argued that despite its popularity among a good number of scholars, the rationalistic account of learning suffers from serious flaws. A conglomerate of empirical and theoretical evidence challenges the notion of 'language of thought'. Self-interpretive power of the language of thought, inaccessibility of cognitive theories to truth conditional meaning, meaningful experiences, inability to test memory, problems with modularity and regulation are simply some of the arguments that might be raised against the idea of 'language of thought'. Finally, a framework for the acquisition of language is presented.

Keywords: Universal Grammar, language of thought, verifiability, falsifiability, rationalism, positivism

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1. Introduction

1.1. The question of the relation between language and thought or language and mind has always been a burning issue, and it will probably continue to remain so in future. This has led psychologists and philosophers over the previous centuries into heated debates about whether language is an innate propensity or a phenomenon with no genetic make-up which is fashioned once a person is exposed to a human language. Of the language acquisition theories suggested over the years, one linguistic theory concerning the acquisition of language knowledge which has still stood up to counter arguments is the '*Language of Thought Theory'* that was proposed by Fodor and underlies the backbone of Chomsky's *Universal Grammar* and what has recently been called the *Principles and Parameters theory*. This article is intended to describe Fodor's theory in succinct terms. Then, it will be argued that the theory suffers from grave flaws and thus cannot survive scientific tests of precision, and so it has to be replaced by a more comprehensive one. Having put forward a few of the arguments against this theory despite its promising face value, a framework will be suggested that will try to explain the phenomenon of language acquisition more efficiently. The suggested model is believed to yield itself more to scientific experimentation and evaluation.

1.2. The Epistemology of Language Acquisition: An Overview

In the realm of epistemology, advocates of the long-lasting empiricism believe that the knowledge we possess is acquired through sense data or perception or sensory experience. Therefore, knowledge is the product of our sensory perception. The brain, as a muscle, plays a minor role in the interpretation of the incoming knowledge since it is only a blank slate, a blank marble with no veins (Bailey and Gillespie, 2002). This attitude towards the role of the mind probably originated in positivism which became dominant at the turn of the 20th century. They defined the borderline of science in terms of analytic and synthetic statements. And they considered anything except analytic and synthetic as nonsensical or metaphysical. They defined a synthetic statement as one which is verifiable. What is crucial to say is that they considered verifiability as the criterion for sciences and argued that the form of knowledge is quite free (Popper, 1977: 86). Indeed, the main reason why epistemologists with empiricist leanings tend to pin their faith to the method of induction seems to be their belief that this method alone can provide a suitable criterion of demarcation. This applies to those empiricists who follow the flag of positivism (Popper, 1977: 34). As Bailey and Gillespie (2002) believe the blank slate mentality is taken up by those who

believe human traits can be altered with the right changes in social institutions. After all, finding a criterion of demarcation must be a crucial task for any epistemology that does not bow to inductive logic.

In 1950s, it was found out that logical positivists had made a grave mistake by assigning verifiability to separate sciences from non-sciences. In their anxiety to annihilate metaphysics, logical positivists annihilated natural sciences as well. This is because it was observed that ' strict universal statements', theories, laws and hypotheses are not verifiable but falsifiable and they cannot be logically reduced to statements of experience (Popper, 1977: 40). This shows evidently that induction cannot offer a criterion of demarcation. Roughly speaking, logical positivists had managed to defeat their own cause.

Popper introduced 'falsifiability' as a criterion for meaningfulness in 1950's and proposed the notion of hypothetico-deduction of sciences. Positivists would have to deal with as to which was observable, and would have to describe the entities with 'unbiased' observation through inductive means. As far as language was concerned, they could propose theories of phonology and syntax; however, could not come close to meaning in as much as it was non-observable. They described the structure of *language acquisition* in terms of limited elementary 'peripheral processing mechanism'. These mechanisms provide an analysis of experience and sense data and that knowledge beyond that, is acquired by inductive processes. (Chomsky, 1965: 48).

Long before logical positivists, German philosopher, Kant said that human perception is selective, that we perceive not what is presented to us but what we want to see. We see the world not as it is but as we want it to be. If this is true, unbiased observation is never plausible, and one always approaches the world with preconceptions and expectations. If unbiased observation is not possible, then perception is 'theory- laden', and we cannot have inductive inference (Popper, 1977: 45). In fact, this rationalistic belief constructed the foundations for defining modern sciences. With regard to *language acquisition*, on the basis of this theory, sense data do not give anything beyond corporeal movements. It is the faculty of thinking, inherent to us, that provides ideas (Chomsky, 1965: 50). Descartes asserted that no idea which we have in our minds has taken its rise from senses except those movements, which are created in the brain through senses (quoted in Chomsky, 1965: 48). Therefore, theory makers in the psychology of language acquisition found their way into the mind in order to bring mentalistic accounts of the way that language is acquired.

In rationalists' view, of language learning is a matter of drawing what is innate or inbred, that we are born with an inherent device of some kind that predisposes us to language. Plato and Fodor allege that learning presupposes an innately determined construct, and performance can be explained with reference to that natural propensity in our brain (Enrling, 1993: 24). Fodor claims that psychological processes that underlie human learning and behavior are computational or the manipulation of symbols according to rules, which our minds are already equipped with. Chomsky attributes this computational procedure to UG that seeks the optimal instantiation (2005). Hence, learning is a manifestation of what is already inbuilt within us. Form of knowledge, in this sense, is fixed in the mind and experience is only necessary to trigger knowledge. In fact, it is the power of the 'framework' which enables us to step beyond what is presented to us (Enrling, 1993: 25).

In psychology, as a reaction to the behavioristic notion of learning, which failed to explain higher mental processes like language and concept- formation, Chomsky proposed *Universal Grammar* which includes *Principles and Parameters* with principles being already fixed for all languages as well as a set of unfixed parameters (Cook and Newson, 1997: 35). More specifically, he asserts that "the grammars of all languages comprise a series of inter-related components called modules" (Radford, 1990: 4) 'specialized mechanisms' for learning (Chomsky, 2005: 5). Chomsky argues that human language is biologically isolated in its elementary or essential properties (Chomsky, 1997). Fodor rebuffs behavioristic psychology on the grounds that we can go beyond our experiences with language, and that the theory falls short of a sound and valid reason for the psychological processes involved. On the face of it, the attack can turn to Fodor in as much as these psychological processes are operating but they have nothing to do with learning; because to know about or be aware of these processes does not affect learning. Learning is an external process not internal (Enrling, 1993: 62).To account for productive learning, Fodor proposes a miraculous language of thought which will be discussed below.

1.3. Language of Thought

The underlying principle behind the language of thought is that human beings possess some universal formal properties, which enable us to assign meanings to natural language. Chomsky's (1972) explanation seems convincing:

The structure of formal logical languages is characteristically simplified, but that simplification is only expressible through a human language. Thinking involves the use of language or a similar system. In this way, language is the mirror of the mind (p.47).

The idea of language of thought originated in Plato's conception of learning and it has been followed by Fodor. Aristotle also speaks of universal properties of the mind to account for meaning in language while Fodor talks of a representational system sharing a number of similarities with natural language (Enrling, 1993: 43). Both constitute a productive power for this innate language faculty with no restriction. In other words, rules of the language faculty, they argue, are recursive and so there is no upper limit for the potential number of sentences one can produce. In fact, when Chomsky talks about an ideal listener/speaker within a 'homogenous speech community' he implicitly alludes to that unification, which he asserts to exist within the minds of all individuals speaking at least one human language (Chomsky, 1965: 3). Recently, Chomsky assumes that the human intellectual capacity, of whatever sort, essentially embodies the faculty of language (Chomsky, 2005).

The Chomskyan argument in favor of finite resources to unbounded competence and structural recursion is overwhelmingly persuasive. The argument would be more fascinating if, as Lycan (1993) postulates, the representational system deployed a physical representation or a physical state in the process of thinking.

This strong innatist belief allows the proponents of the computational system to account for the acquisition of new knowledge and the uniformity of language acquisition processes among children learning their first language. Based on this theory, whatever is learnt is already inherently present in the mind. What the individual does is that he relates his new experiences to already existing propositions. In Augustine's conception, language learning is a matter of translation of an inner language of thought to whatever language is spoken around and about the child. Signs direct the mind toward meaning, and cognition of things is superior to their signs (Stoyanoff, 1998: 5). In particular, one cannot learn a language unless one is already equipped with a rich comparable system that represents language. Thus what the child, learning his native language, does is to formulate hypotheses on the basis of the external data that he is exposed to, and then he confirms or refutes his hypotheses by testing them against his language of thought. The uniformity of language acquisition and the poverty of the stimulus argument allow us to claim that linguistic knowledge is innately determined (Radford, 1990: 17; Cook and Newson, 1997: 82). Chomsky adds that 'even the most elementary concepts of human language do not relate to mind-independent objects by means of some reference-like relation between symbols and identifiable physical features of the external world … (Chomsky, 2005: 4).

Even if we accept the assumption of a *language of thought*, which is underpinned by Plato, Aristotle, Kant, Fodor and Chomsky, we have to admit that it is an area of controversy at least among contemporary philosophers and psychologists. The next section discusses the validity of this construct and argues against it.

2. Language of Thought: Pros and Cons

Proponents of the *language of thought* argue that language of thought is per se meaningful, and two sentences are semantically different if they are different in their representational systems. In other words, it is the *language of thought* that assigns meanings to natural language sentences. At first sight, it appears that this proposition has been capable of justifying the mind-boggling problem of human kind. In fact, many philosophers and psychologists have been enchanted by the persuasive power of the theory. However, there is at least a fairly equal number of well-founded claims for the non-existence of a language of thought.

2.1. Fodor claims that language of thought is a formal system; it is not just a system of meaningful syntax. Lycan (1993) argues for a language of thought on the grounds that we need to posit a language of thought to explain the productivity of human thinking. Enrling (1993: 57) argues that since no linguistic system is self-interpreting, for that reason we will encounter the problem of dealing with an endless number of *'languages of thought'*, hence, the basic intuition of Fodor's model, namely that *language of thought* is a meaningful system, is lost. In the words of Abbott (1995), it may also lead to the hard-to-believe view that we are inherently endowed with an astronomically large mental lexicon. Fodor points out that cognitive theories cannot have access to truth- conditional meaning and reference. They can only deal with formal rather than substantive meaning which comes from syntax. According to Enrling, if this is so, there should be no way for psychology to attain meaning or knowledge, because knowledge is connected to truth (1993: 46).

2.2. Proponents of language of thought assert that thought is meaningful, or more precisely, it includes formal meaning. If we believe that our experiences include more meaning than the formally presented meaning, we have to accept that part of our new learning experiences cannot be described by language of thought. Thus, either we have to accept that no further learning occurs, or if it does, it cannot be accounted for in terms of *language of thought* phenomenon. If learning, according to Fodor's account of knowledge, is modulated by *language of thought*, strictly

speaking, one can argue that no learning is taking place. In other words, if we deal with a knowledge inherently fixated in the language of thought, we end up with the thought that "knowledge of rules and an internal representational system is enough to explain human cognitive conduct", and social and biological factors play no role (Enrling, 1993: 57).

2.3. Furthermore, cognitive psychologists claim that they test memory and perception to discover the nature of *language of thought*. However, there is, actually, no way to test memory or even perception directly. All that yields itself to testing, Yehouda Harpaz argues, is behavior which is a result of cognitive processes which integrate past information, current information and emotional state (1996: 4). They also assume that the mind is a modular system. According to the modularity hypothesis, the mind is a structured phenomenon which is made up of several compartments, each being distinct on the basis of its functional properties (Smith and Tsimpli, 1995). Thus, for instance, the fundamental distinction between perception and cognitive systems, Smith and Tsimpli argue, is "where the former pertains to sensory plus language, while the latter refers to 'central' systems responsible for the fixation of belief, for thought and for storing information' (Smith and Tsimpli, 1995: 56). In addition, cognitive psychologists propose that this modular system, which interacts with the central system includes propositional knowledge. For Fodor, modules are 'informationally encapsulated'; that is, they do not share information with the central system, and their processing cannot be affected by the central processes such as memory, inference and attention (Gerrans, 2002: 260).

Nevertheless, if it is possible to uncouple the effect of different systems, Gerrans (2002) maintains, this requires an extensive knowledge of cognitive processes. For example, it is too difficult to sustain a distinction between reading and parsing which seem to require input from central systems. On the other hand, if one agrees with the above dichotomy that the central systems account for thought and modular systems cater for perception and language, it appears unrationalistic to accept interaction between these two sources of language of thought- central and modular- and not to side with mutual effects of these two. Vygotsky (1962) complies with the same belief to boot:

Like in animals, thought and speech have different roots in human kind, thought being nonverbal and language being nonintellectual in an early stage. But their development lines are not parallel- they cross again and again [even before age two]. At a certain moment around the age of two, the curves of thought

and speech, until then separate, meet and join to initiate a new form of behavior. That is when thought becomes verbal and speech becomes rational. A child first seems to use language for superficial social interactions, but at some point this language goes underground to become the structure of the child's thinking. (quoted in Schutz, 2002: 2).

Nevertheless, despite the argument for the language of thought being sound, without sufficient and justified reasons, modularity is fatuous and ludicrous, and eventually it falls to pieces.

2.4. It should be added further that logically in a communication process, each participant regulates his/her patterns of behavior by admitting to the communication principles to make communication possible. Besides, each participant's behavior affects the other interlocutor to some extent implicitly or explicitly. This is all carried out to achieve a certain degree of fit in the process. Even if one believes in Fodor's claim about the unidirectional link between the modular and the central systems, applying the above arguments to the mental systems, it appears that both systems are affected once information is flowed from one side to the other side- one side sharing information and the other side gaining information.

2.5. One vexed question concerns the *inception* of this so-called innate *language of thought*. If the innatist apostles admit that biological evolution could principally culminate in this miraculous power of the mind, as Chomsky blatantly argues that language is biologically determined and 'a component of human biology that enter into the use and acquisition of language' (Chomsky, 2005: 2), according to Enrling,

They would be undermining their basic position that simple systems cannot on their own give rise to more adaptedly complex ones. The two may be right in their assertion that all human conceptual knowledge is innate. But, their basic argument that such knowledge must be innate because a new, more complex, adapted system cannot emerge from a preexisting less complex adapted system is obviously flawed. The evidence that the mammalian brain undergoes a type of adaptive evolution and selection of synapses provides an important additional reason to doubt Chomsky and Fodor's innatist views (Enrling, 1993: 69)

Owing to, under these circumstances, one's qualms about the empirical validity of the providential theory, it is not pathological to remain quizzical about the falsifiability of the theory as well. Hence, unless questions of this type are answered by proponents of *language of thought* the argument that modular systems

are unaffected by the central system remains a burning and an unsolved issue.

3. Conclusion

3.1. Hare-Brained Productivity or Down-to-Earth Finitism

Given the above arguments against the *language of thought* theory, it seems that language is not genetically determined and to bolster a language of thought by adhering to the poverty-of-the-stimulus argument is definitely not sufficient. The data may not be inadequate for the child to construct a grammar but for a linguist to build his theoretical grammar. It is maintained that certain capacities or behaviors that enable language acquisition may be genetically endowed. Language growth is not akin to seed growth as has been suggested by the advocates of innateness hypothesis such as Cook and Newson (Cook and Newson, 1997). A seed does not determine whether to have flat leaves or a bulky trunk or any other shape when it begins to grow in the presence of rich soil. This is part of the seed's biological foundation that in the presence of input, as a triggering device, converts the seed into a tree. The seed has no intention in this regard. Contrary to this, the child's intention to communicate with the world around him forces him to manipulate the language input and so adjust the (genetically determined) framework to the type of input he has received. The goal is to speak a language in ways similar to the speakers of the community, and this is achieved through the variability of word relationships in language use and negotiation of meaning (Stoyanoff, 1998: 3; Kenny, 1973: 155). Without this shared belief, communication breaks down. "Words have as many uses as money, which can buy a cow, a title, a seat at the theatre, rapid travel, or life itself" (Kenny, 1973: 155). Thus, learning is a process of assimilating and adapting new structures, knowledge and behavior and accommodating old ones. In this process, the child learns to assimilate new sounds in the language while simultaneously learns to conceptualize his behaviors. The accommodation process is not static but open-ended. Language learning means adopting certain open-ended frameworks or norms. Learning in this sense does not involve transcending the given information, but acquiring the limits of language. These limits are acquired on the basis of a finite set of innate behaviors, finite set of examples and finite social encounters which enable the child to use language as a tool for communication (Enrling 1993: 135). To choose to say *the mat is on the floor* rather than *the floor is under the mat, upside down* not *downside up, back to front* not *front to back* nor any other alternative is determined by the restrictions

that the communication situation imposes on the framework. Therefore, language learning entails learning how to adapt the potentially boundless framework to the limits made by the speakers of the society.

Fundamental to Wittgenstein's conception of meaning, as Kenny (1973:16) argues, is finitism, that is, the encyclopedic meaning of a word does not determine further uses. Language learning in this sense is not to go beyond what is presented to you but to acquire constraints and curbs of a phenomenon that can go unrestrained. Language learning is a process of structuring, ordering and discovering the limits of language. It is the acquisition of a framework which is mounted on the examples of language behavior. The child is exposed to and is shown examples of correct language use within the boundaries set by the community, and only later does he learn to make examples of his own based on the training that he has received. Otherwise, without constraints on the linguistic properties for the child, there is an astronomical number of interrelations for the child to test. Language learning means acquiring the constraints established by the community in which the child lives.

3.2. A Final Word

When one says that a child is acquiring a language, there are at least three types of senses with reference to first language acquisition. First, he learns to produce well-formed utterances that conform to the rules of the target language. This ability he gains on the basis of finite examples that he has been exposed to especially in the early language games, in which he always constituted one side with the adult standing on the other side. This is the process of identifying the meaning of words used. This view is in stark contrast with Chomsky's idea that uniqueness of language is not so much its role in communicating but its role in evoking cognitive images creating mental worlds (2005). Second, language does not take place in a vacuum. In other words, he learns to use language in context to refer to and to mean. It is impossible to use language to refer to or to mean independently without context. Therefore, in order to disambiguate language, he learns to exercise context under certain constraining conditions in which it is uttered. Is the expression 'look' a warning or a reference to something to be seen or having an appearance that befits or turning the attention of somebody to a speaker? The third sense of language that is acquired when a child learns a language concerns the functions or communicative intent, that is the identification of implicatures over and above the propositions expressed. In other words, the child learns how to verbalize his intentions

into language. In fact, he learns to use language to offer and demand goods and services and information (Halliday,1989). The latter is specifically served through language. In other words, he gradually abandons his natural gestures and actions and replaces them with arbitrary and conventional linguistic signs. Instead of pointing to an object to show his desire to have it, he learns to employ linguistic signs to carry out the same function. Fodor's view of language learning seems to fall in the first sense stated above and only meager reference is made to the other two senses since experience only does the function of triggering in his suggested processes. However, these three aspects of language seem to be acquired interdependently. The transactions that occur in such formats between the child and the adult constitute the input from which the child masters grammar, learns to mean and to refer and to express his intentions. Obviously, some genetically determined behaviors are necessary, but they cannot function without the contribution put forth by the adult who enters into this transaction participating in language games. This format provides a supportive environment and frames the language input to those innately determined behaviors in a manner to make the whole system operate. The input in the environment is not always appropriate for the child to take in. The crucial role of the adult becomes evident here as he has to manipulate the input to make it digestible. This simplification of language comes about through interaction and negotiation with the child in the context of language use. It is the interaction between those innate behaviors and the adult support that makes it possible for the child to enter the linguistic community. This format requires sensitivity to a patterned sound system, to grammatical constraints, to referential requirements and to communicative intentions. This can be fulfilled by predicting the environment, interacting and moving towards goals with the aid of the participants and the like.

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زبان تفکر: واقعیتها و خیالها

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در طول تاریخ، محققان امر فراگیری زبان در تلاش بوده اند تا مسئله فراگیری زبان را که ذهن بشر را به خود مشغول کرده است توصیف و تشریح نمایند. در این راستا، دو مکتب فلسفی تجربه گرایی و عقل گرایی همیشه با هم در تعارض بوده اند. یک گروه از مکتب تجربه گرایی (یعنی مثبت گرایان) نقش ذهن را در یادگیری حذف می کنند و ادعا می کنند که قرار گرفتن در معرض زبان به تنهایی می تواند باعث فراگیری زبان شود. از طرف دیگر، طرفداران مکتب عقل گرایی مهمترین نقش در یادگیری زبان را به ذهن منتسب می‌کنند. این گروه ادعا می کنند که انسان دارای استعدادی ذاتی به نام زبان تفکر است که با قرار گرفتن در معرض زبان طبیعی (مادری) فعال شده و زبان طبیعی را فرا می‌گیرد. قرار گرفتن در معرض زبان طبیعی که به نظر چامسکی (۱۹۸۰) آینه زبان تفکر است تنها زبان تفکر را فعال می کند و بنابراین نقش عمده ای در کیفیت زبان تفکر ندارد. در این مقاله انتقادی، بحث می‌شود که علیرغم شهرت و آوازه این نظریه شواهد نظری و تجربی موجود نظریه زبان تفکر را باطل می سازد: توانایی خود تعبیری زبان تفکر(self-(interpretive، عدم دسترسی پردازش های شناختی به مفاهیم حقیقت–مدار truth-conditional (meaning) تجربه‌های معنادار، عدم امکان آزمون حافظه جهت آزمایش آن، مشکلات نظریه تخصیص دهنی (modulaity) و ارتباط آن با سیستم مرکزی ذهن و همچنین تکامل بیولوژیکی مشکلاتی هستند که نظریه زبان تفکر را به چالش می کشاند. در پایان این مقاله با در نظر گرفتن مشکلات نظریه زبان تفکر که زیر بنای دستور جهانی چامسکی را تشکیل می دهد ، چار چوبی بر پایه نظریه های ویتگنشتاین و ویگوتسکی ارایه شده است که شاید بتواند پدیده زبان آموزی را بهتر توجیه نماید.

کلید واژگان: عقل گرایی، تجربه گرایی، زبان تفکر، مثبت گرایی، دستور جهانی.

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۱. دانشیار، گروه زبان انگلیسی، دانشگاه شیخ بهایی اصفهان

۲. استادیار، گروه زبان انگلیسی، دانشگاه شهید چمران اهواز