

Language as Information and the World

“Interdisciplinary approaches following Locke’s Sensation and Reflection”

Kant Koga

14/02/2010

Abstract

Language attracts everyone on earth. That is because we have and use language. Although there are some minority languages that have limited expressions such as the lack of writing systems in *Aynu itak* and *Shona* languages, they can effectively express their emotion and thought with their languages. In addition, every human being can acquire their native language regardless of how difficult the linguistic structure of the language. Noam Chomsky (1965) pointed out that the language specific domain in the human brain, called *The Language Faculty*, stimulates humans to acquire language. He also posited that the production of human language from the faculty comes as a consequence of natural human endowment that works innately in the human brain. On the other hand, Steven Pinker has a different view on the language faculty. He believes that biological adaptation affords humans the language faculty and it is truly instinctive, following Darwin’s natural selection. These two different views give opportunity for researching why human language and its faculty exist in the human brain. Truly speaking, the major function of human language is to verbalize our thoughts and feelings to others and to the speakers or writers themselves. Therefore, language must contain “Information” and “Meaning”. Generative semantics, as suggested by George Lakoff and other

recent linguists, provides a sharp contrast with what Chomsky and Pinker claimed in their interpretive approach to language, which is well-known as Chomskyan linguistics. Although there appear to be some expressions in a particular language that have no meaning, or non-sense expressions, they must entail some meaning. For example, Chomsky's famous non-sense sentence "*Colorless green ideas sleep furiously*" does not seem to have any specific meaning because it is just non-sense, which Chomsky himself claims. But this sentence does express the meaning "nonsense", so it does contain the particular meaning "non-sense". On the basis of the argument, there is an assumption that every expression in any language existing in the world must have a specific meaning that we utilize in every day life.

This dissertation mainly focuses on the matter of "information" in language and how humans perceive and feel towards it from the natural world. I shall specially follow the idea of human "sensation" and "reflection", which was originally extrapolated by British empiricist philosopher John Locke (1632~1704). In the first chapter, I begin by evaluating Chomsky's revolutionary thought on linguistics that still affects current linguistics and even his opponents. In the second part of the chapter, some different theories of language structure proposed by Richard Hudson and other linguists will be evaluated and compared with Chomsky's generative grammar. In the second chapter and the third chapter, I will address two philosophical questions. First, I would like to focus on Humboldt's Problem that asks what are the knowledge and faculty of language. Doing research on this question has great importance for my studies of language, because I will focus on the inner sense of the English language which develops from the faculty of language in the human brain. Both Noam Chomsky and Steven Pinker have proposed theories on the faculty of language. Despite their

efforts, there remain a lot of unresolved aspects to the faculty of language. I would like to further challenge this theme by taking a new syntactic approach called “Digital Construction Grammar.” In doing so, I will observe how humans perceive the information they intake from the world around them. Language, for example, has many unique functions that respond to various stimuli from both humans and the world in which they live. Humboldt’s Problem mainly asks about the relation between language creation and human nature such as functions of the mind in the brain. Social factors from the external world must also relate to human actions such as the creation of language. I will provide support for my theory with results of my research on English prepositions at University College London (2008) and Digital Hollywood University (2009) which reveals language structures strongly reflect their social and environmental background. The concluding remarks give some further explanation on my beliefs regarding the language faculty and offer possibilities for future studies in a wide range of academic realms.

For all living on earth

Kant Koga

I devote this academic dissertation to everyone on earth. I have a lot of gratitude for my teachers at both Digital Hollywood University and University College London, who provided me with a great deal of motivation and excellent conditions to research my academic theme and helped me conduct my research for this dissertation. I especially thank James Sinclair-Knopp, Tetsuya Noguchi, Joseph Heilman, Michael Ringen and Yumiko Noga, all of whom gave me useful comments on my studies.

Contents

● Introduction to the First Chapter 6P

Chapter 1

1. The Aspects of Chomskyan Theory and its Origin 8P
2. Chomsky VS Hudson 12P
3. Summary of Chomsky's ideas and their influences 17P

● Introduction to the Second Chapter 19P

Chapter 2

1. Humboldt's Problem 21P
2. Power of Language 24P

● Introduction to the Third Chapter 31P

Chapter 3

1. Can English Prepositions be Troublesome? 33P
2. Applying the Theories to Second Language Acquisition 37P
3. The Cues to the Problems of Prepositions from Sentimental factors 41P

● Concluding Remarks

For the Future Explanation 45P

References 48P

Introduction to the First Chapter

Language is a major means of communication among human beings. It is also unique to them because no other species of animal seems to have the ability to acquire languages. There has been some research that focuses on acquiring language for non-human beings such as monkeys and bees (Jenkins, 1997; Chomsky, 2004 et al). However, the research could not extrapolate language existence in the animals researched. Historically, there have been several studies completed regarding human language. Around the 19th century, a theory developed named “American Structuralism” where the structure of language is considered as a systematic combination of each word. This theory does not take into account the language production process. It was boldly proposed by one American linguist, Leonard Bloomfield; therefore, it can also be referred to as the Bloomfieldian theory. However, this tradition has been replaced by newer theories such as Universal Grammar as proposed by Noam Chomsky. “Bloomfieldian linguistics had gone out of its way to show contempt for the work which Noam Chomsky was now raising to a position of respect and admiration” (Aarsleff, 1981). Noam Chomsky, an American researcher, is considered to be one of the most prominent figures in linguistics having a number of influences on linguistics today. He has proposed a number of new ideas and theories that bring new perspectives to linguistics studies. In particular, “generative grammar” and “universal grammar” (UG), as mentioned previously, have great influences on a syntactic approach to language.

The first Chapter of this dissertation is divided into two sections. First, I will discuss some Chomskyan theories and some ideas that influence current linguistic studies. Second, I will focus on the views of other linguists who take different approaches to Chomskyan

linguistics by mentioning some differences and similarities between their theories.

Chapter 1

1. The Aspects of Chomskyan Theory and its Origin

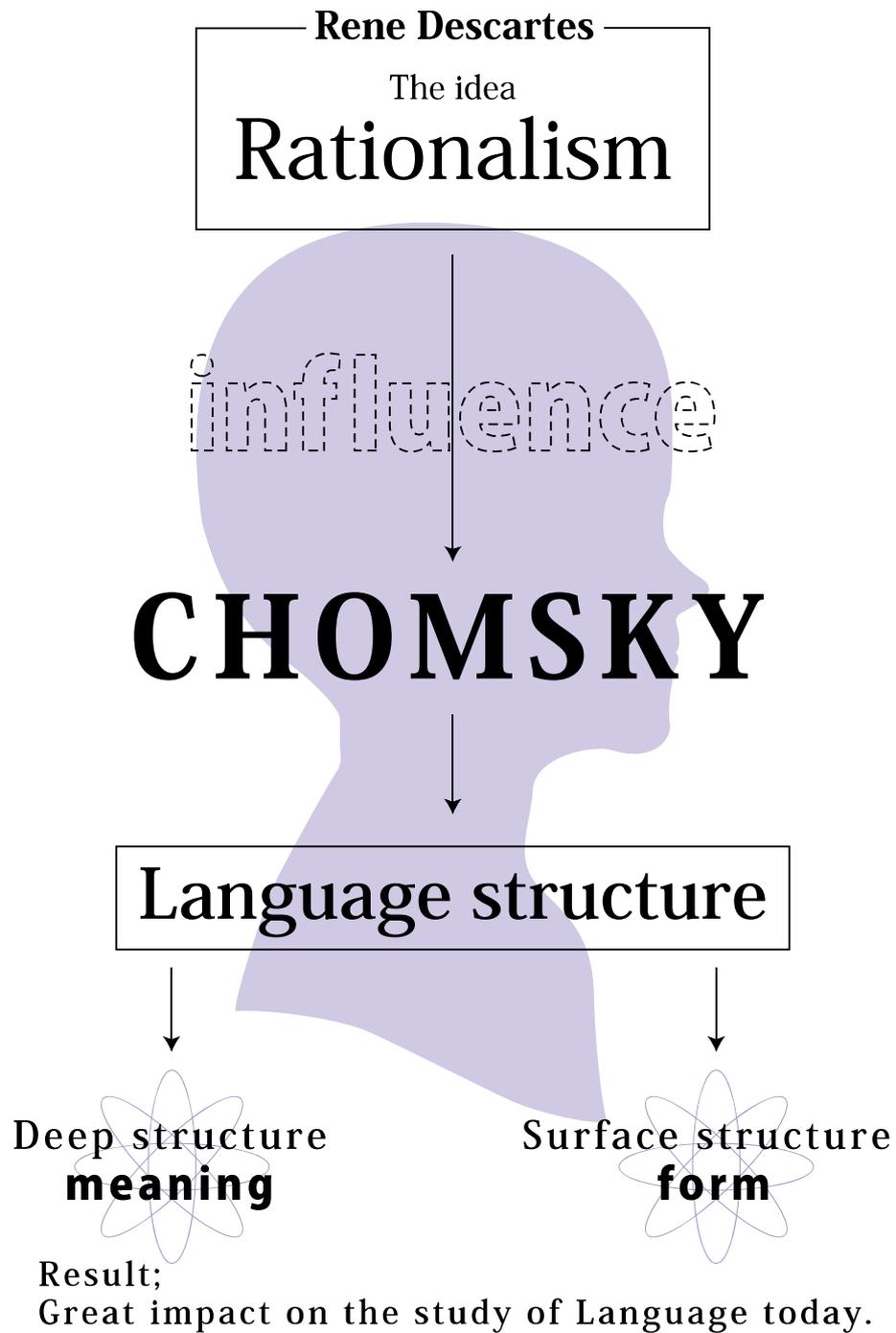
According to Chomsky (1965), his first interpretive approaches to defining the idea of language structure was strongly related to syntax and semantics. In his view, the structure can be separated into two structures which are deep structure and surface structure. Deep structure underlies the real meaning of a sentence which a speaker intends to express, or means. Surface structure represents the exact form of the sentence which a speaker utters. Because of the ambiguity of the surface structure, Chomsky defines deep structure as the recognition process of the meaning of a sentence. Importantly, his ideas have a great influence on syntax studies today because they scientifically describe the production of language in the human brain. He states that language studies should not only highlight a language's systems and rules, but it should also be concerned with the human process of acquiring the language which he relates to linguistic competence and performance. Chomsky mentions that *"people make a fundamental distinction between competence that is the speaker-hearer's knowledge of his language and performance that is the actual use of language in concrete situations"* (Chomsky, p4, 1965). He has himself cogitated about the relation between language and the human brain. He asserts that each human brain has its own module, that is, the faculty of language, which can be recognised as the origin of language production. Chomsky posits that human language creation and production should come from this faculty in a natural manner. He further states that the language faculty and its system should be separated from other cognitive domains in the human brain that stimulate humans' emotion, thought and feeling,

which suggests that Chomsky does not agree with the argument that the psychological and cognitive processes of the brain affect language structure, as George Lakoff, the American Linguist, hypothesises. He has even tried to separate the influence of structure from humans' cognitive domains except for the language faculty. His main claim is that the language faculty specifically concentrates on language and no other domains directly facilitate the use of language. Thanks to this isolation and concentration on scientific and mechanical analyses of language structure, the syntactic and semantic components of the structure of language are clearly introduced and recognised.

Although his ideas seem to be strongly influenced by Rene Descartes, Chomsky has not often mentioned or cited him (Aarsleff, 1981). There are three aspects of Chomsky's reasoning that explicitly support the idea that Descartes had a great influence on him and his language theory. First, the base of Chomsky's theory seems to be strongly related to the idea of human innateness or Rationalism which stems from one of Descartes' beliefs that human beings innately have some aptitude for acquiring knowledge. For instance, Chomsky's idea of Universal Grammar (UG) posits that humans have an innate ability to acquire language through the language faculty. Particularly, UG, explanation of the child's innate knowledge and its use in acquiring language, definitely has a great influence from the theory of Rationalism. Second, his view of language structure is highly systematic. For example, his idea of deep and surface structure seems to be influenced by a systematic based theory such as the Cartesian mathematical view of the world and gives a highly functional view to language structure. Third, his strong encouragement of the isolation of language from psychological concerns is derived from the idea of Descartes' Dualism that emphasises the observation of

human beings. To sum up, Chomskyan linguistics seems to be based on the theory of Cartesian linguistics in terms of the system in which language is produced and how it works (Diagram.1). Chomsky adds that linguistic study needs to focus on the definition of how human beings create a sentence and recognise it from other speakers. He criticized the traditional study of language such as American Structuralism. He claimed that it does not clearly explain the language structure because the idea only highlights the system of a sentence and simply ignores the process of the language produced by humans. Chomsky also claimed that these approaches to language are totally isolated from human biological factors, some of the most important elements in Chomskyan linguistics.

<Diagram.1>



Designed by Yoshiyuki Kato (Digital Hollywood University)

2. Chomsky vs. Hudson

There are several linguists who have different opinions and ideas from Chomsky. Richard Hudson is one linguist who has a different approach to language studies. He claims that language study should not be separated from human cognition. He posits that *“language is not sui generis, a unique system which can, and should, be studied without reference to any other system; this may have been a healthy methodological antidote to the psychology of the early twentieth century, but the intellectual world has changed”* (Hudson, 2007). His theory of linguistics is generally based on the human mind unlike Chomsky’s theory that language studies should be taken in isolation from other human cognitive functions and focus on the human genetic endowment, “The Language Faculty”. Chomsky’s idea entails some basic definitions of language structure which are often stipulated by only a native speaker’s intuitive sense. On the contrary, Hudson’s idea of the structure is always highlighted by the process of the human mind, supported by psychological approaches that have a long history and research to support them. Therefore, it is said that Hudson’s idea is scientifically more organised than Chomsky’s in some ways. Hudson and many recent linguists conduct data-based and corpus-based studies and sometimes take behaviourist approaches to language, which has actually been rejected by Chomsky over the past 50 years. This fact simply elucidates how Hudson’s ideas are in opposition to Chomsky’s claims. Hudson proposed “Word Grammar” (WG) to recognise the structure of language (Hudson, 2007). It has a quite different approach from Chomskyan theory in which each phrase is distinct from a mother (or base) sentence, Hudson’s Word Grammar focuses on dependencies of each word. Hudson himself

explains that the grammatical functions in Word Grammar are more basic than Chomsky's Generative Grammar, and can be more readily understood. Hudson (2007) claims that his Word Grammar provides a clear explanation of the language structure for linguists. Hudson's idea seems to be easy to understand, as he mentions, since his theory does not utilize a systematic combination of phrases as can be seen in Chomskyan studies. In Word Grammar, each word is linearly allocated, and there is distance between each word that demonstrates the relationship of every word in a sentence. Moreover, this clear expression helps everyone to recognise the original structure of a sentence. In contrast, in Chomsky's Generative Grammar, the original form of the sentence is hardly seen because the basic form of the sentence is dramatically changed into a deep structure to define the meaning of the sentence.

In terms of the history, some linguists claim that Chomsky's idea is still immature. According to Hudson (2007), his idea of Word Grammar which consists of 'networks' where every word in a sentence is connected with each other has a system whereby meanings and functions of a word are dependent on those of other words called parent words. This theory emphasises the relationship of each word in a sentence; therefore, it is sometimes called Dependency Grammar. The basic idea of Dependency Grammar has already been proposed by several linguists and psychologists. Hudson states that *"The dependency tradition is originally with roots in Paninian grammar (Bharati, Chaitanya, and Sangal, 1995) and in the ancient grammars of Greek, Latin (Covington, 1984; Percival, 1990) and Arabic (Owens 1988)"* (Hudson, p117, 2007). The long history of dependency grammar means that there is sufficient research done to support the clear and explicit ideas for linguists today. On the other hand, Generative Grammar has a great influence from American Structuralism which was originally

derived from Bloomfield's theory of language structure which was based on the theory that Ferdinand Saussure posited around the early 19th century. Therefore, Generative Grammar seems relatively new compared with what Hudson proposes. Chomsky's opponents claim that his theory of grammar lacks a long history and sufficient support to explain language structure. They also claim that it is even an abstract and contradictory idea. According to Aarsleff (1981), *"Generative Grammar generally focuses on ideas that have already been forgotten and ignored and have totally become old fashioned these days."*

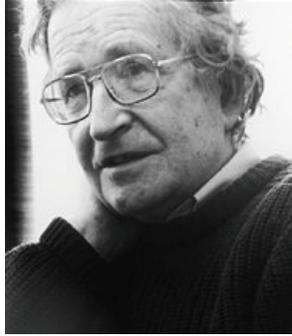
Michel Breal, who is a French linguist, posited that *"Generative Grammar lacks a crucial qualification, which is that the object it treats does not exist in nature. Language is a human ability: it has no reality apart from the human mind."* (Breal, 1891) Although Chomsky tries to separate the study of language from the human mind, he assumes that the production of language is strongly affected and controlled by it. Therefore, there appears to be some contradictions in his theory. There are many linguists who tackle this point such as Robinson, Lakoff and Nobuo (Robinson, 1975; Ikeda, 2006) According to Maiko Ikeda, Chomsky's systematic view of the language structure cannot be accepted, because language itself must be full of meaning, and it directly intervenes and affects other structures. Therefore, even if linguists can predict and define the structure of language by using Chomsky's theory, which ignores or does not clearly express the relationship between the human mind and language, it will produce strong ambiguity and a crucial defect (Ikeda, 2001). Robinson (1975) mentions that Chomsky's theory simply goes back to the old fashioned way of thinking about language such as Wittgenstein's theory that *"there are not meanings going through my mind in addition to the verbal expressions."* <Diagram.2>

Even though there are several differences of ideas and opinions about language structure between Chomsky and Hudson, there are also some similarities between them.

First, both of them try to focus on the structure of language by using a syntactic approach. Chomsky proposed a deep structure to expatiate the syntactic relationship that a sentence has by defining the phrases and nodes of the sentence, each of which can be connected by strings. Likewise, Hudson's idea of Word Grammar emphasizes the relationship between each word by using strings and emphasizes dependencies of each word in a sentence. Second, they both agree that language can be related to some other factors such as social, psychological, and even economic factors although Chomsky is often reluctant to apply psychological matters to language structure studies.

<Diagram.2>

Language is



VS



Chomsky

Hudson

Nature
(Rationalism)

Nurture
(Empiricism)

Generative Grammar Dependency Grammar

Complex?

Simple?

Which is better?

Designed by Yoshiyuki Kato (Digital Hollywood University)

3. Summary of Chomsky's ideas and their influences

Regarding Chomskyan theory, some linguists such as Hudson have different views of language structure as I discussed. Firstly, Chomsky stresses the isolation of language study from any psychological study connecting semantics unlike Hudson who insists language should be concerned with human cognitive abilities. Secondly, Chomsky's idea seems to be too complex and complicated to define language. There is an argument amongst linguists that they should try to propound any theory as clearly as they can. However, Robinson suggests that *“Chomsky has introduced specialist terminology of his own, uses without definite words such as well-known terms as word, noun, verbs and phrase and asks very traditional questions about the grammaticality of sentences.”* (Robinson, 1975)

Lastly, although there are some critiques about Chomsky's view of language, nobody who studies linguistics can ignore his theory of language. Chomsky has had a significant impact on linguistics history and studies. Particularly, his theory of syntax has had a great influence on current linguistics. Moreover, his ideas not only have had influence on linguistics, but also have had influence on other areas of study; for instance, his systematic measure helps mathematicians to solve some mathematical problems. Furthermore, even though Chomsky avoids connecting psychological concerns with language structure, his theory has greatly contributed to some psychological studies such as the human cognition study. His most important contribution can be found in human biological science and the area of language acquisition studies where scientists can relate the human natural endowment such as the language faculty to how children and adults acquire language so effectively. Therefore,

Chomskyan linguistics can be regarded as one of the most important theories in the history of linguistics.

Introduction to the Second Chapter

Since Chomsky posited the theory of the language faculty, there have been many controversies regarding the existence of the language faculty in the human brain and how it works amongst linguists, biologists, psychologists and other specialists who study human mechanisms. Some linguists such as Richard Hudson, Ronald Langacker and George Lakoff doubt the existence of the language faculty. They take different views to a language production system using cognitive approaches. Cognitive Linguistics and Cognitive Grammar (Langacker, Lakoff and Taylor, 1987, 1991 and 2002) reflect the idea of generative semantics that focuses on the production of meaning and sound in language processing. This view seems not relate to traditional generativist views of language creation from the language faculty as Chomsky proposed. Steven Pinker (1994) does not disagree with the existence of the language faculty, but his view of the faculty has a concrete difference from Chomsky's approach. In Pinker's *The Language Instinct*, he states that *"The story I will tell in this book has, of course, been deeply influenced by Chomsky. But it is not his story exactly, and I will not tell it as he would."* (My emphasis) Based on what linguists have discussed over the last 30 years or so, there still remain unsolvable problems with the faculty of language. Chomsky called that problem the "Humboldt's Problem" (1965) with respect to the origin of the generativist view of language structure first proposed by German philosopher, Wilhelm von Humboldt.

The second chapter follows the mystery of the language faculty from the point of view of several linguists. Then, I propose a new syntactic approach to language production from the language faculty, which will solve the difficulty in approaching human inner sense problems

such as how humans perceive and put information in language. This new approach will also help show how humans determine whether sentences are well-formed or grammatical in their languages.

Chapter 2

4. Humboldt's Problem

The 19th century philosopher, Wilhelm von Humboldt first proposed the idea that every human linguistic expression is rule governed. This view that language functions systematically attracts many contemporary linguists who worked on the structural analyses of language such as Ferdinand de Saussure, Leonard Bloomfield and Noam Chomsky. Humboldt posited that this rule-governed system in language allows humans to express infinite sentences with finite meanings, which also provides an opportunity to approach language structures from a scientific view. In Chomsky's *Aspects* (1965), his revolutionary idea of generative grammar, which takes a great deal of its cues from American structuralism for its syntactic analyses, seems to have a great influence from Humboldt's idea of syntactic analysis, as suggested by Bloomfield. Chomsky said that the question "What constitutes knowledge of language?" was Humboldt's Problem. He stated that unsolvable questions with the language faculty theory represented this type of problem. Chomsky generally denies a view that the language faculty is dependent on other cognitive domains in the human brain. He states that the faculty must function as an independent domain and does not work as a *multi-functional domain* in the human brain. This view suggests that the production of language comes from only the language faculty, and it is the so-called origin of language creation. Richard Hudson does not agree with this view of the language faculty. He even rejects the idea of the existence of the faculty. Hudson's main argument is that "*language is not sui generis*" covenants with the factor of other cognitive domains which supports the view that the creation of language should

be the result of cognitive processes in the human brain. Separated from his theory, there are also several approaches from a biological perspective to language production. Since the French physician, Paul Broca (1865) found the frontal lobe in the human brain and the German physician, Carl Wernicke (1874) discovered the Wernicke area located in the superior temporal gyrus (STG) in the human brain (Friederici, 2009), both of which are involved in language production and comprehension, biologists and linguists have been able to make some assumptions concerning the biological relationship between the human brain and the creation of language. So far, much Specific Language Impairment (SLI) research has been conducted following the discoveries of the two areas by not only linguists but also physicians and philologists. Chomsky is one of those linguists that feel there is a strong connection between linguistics and biology. Many of his ideas such as his rationalist view of language, Universal Grammar, Generative Grammar and the theory of language faculty cannot be understood without a human biological perspective. In particular, the language faculty would have not been seen if Chomsky had not related linguistics to biology. Chomsky's term, "*Biolinguistics*" has now emanated a lot of room for linguists to discuss the production of language by human thought including someone doing anti-Chomskyan linguistics. Steven Pinker is one of the linguists who has a great influence on that new realm of studies. As mentioned earlier, he has a somewhat different approach to the language faculty. His basic principle and claim, "language is instinct" comes from the claim that Chomsky made in the earlier stages of his research such as *language and mind* (1968). Although Chomsky's revolutionary work has given some scientific theories such as generative grammar and universal grammar that answer Humboldt's problem asking how the language faculty functions so effectively, there still

remain a lot of questions “how do humans naturally optimize their knowledge of language and put it in their real life, and perceive it from others? Chomsky really does not claim the importance of language as information. To point this, I would like to focus on how human beings perceive and recognise language as information by suggesting an approach to language structure in the next chapter.

2. Power of Language

I believe language is a mass of information. Each language has its power that produces information. Every sentence, word and letter has power that contains information which we can recognise as meaning. Traditional views of “power” are stipulated quite differently from each other. Kant claimed that power *“is linked in a rather obvious way to the size of one and submissive behaviour by the other.”* (Williams, 1993) His view of power mainly concerns physical and physiological affection from one to another. That affection can only work under humans’ commitment. Thus, he needed to stipulate the term “Solidarity” that *“is linked to frequent encounters in early life and to trusting behaviour by both parties.”* (Williams, 1993) According to Kant, power in the world will not be affective unless solidarity comes to our life. That gives us some room for understanding a point that every human action will affect power in our daily life. Another philosopher, Locke determined that power is *“in one thing the possibility of having any of its simple Ideas changed, and in another the possibility of making that change; and so comes by that Idea which we call Power.”* His idea of power is therefore interpreted as “force” that causes any change to both agent and patient positively or negatively. If I am not mistaken, I shall categorise this meaning of “power” as stimulus activation from one to another. I do not limit that activation to only physical phenomena. The activation of power should also be involved in every psychological factor concerning humans’ internal phenomena. Therefore, power and its activation can be found in every use of language. For example, meaning can be motivated to each word with particular power, and it can convert into information which can help humans recognise the word well. Thus, without the power,

meaning in language is never accomplished for human understanding.

George Lakoff (1990) states that every language functions to some degree in order to convey meaning, which must be the main reason why human language exists. If this statement correctly interprets human languages, they must contain meaning all the time. Humans always produce their sentences with meaning intentionally or haphazardly, which we now call language production. Based on that, language without meaning should not be recognised as language, at least for human language. Language not containing meaning, therefore, should be determined with my new term, Inanimate Stabilizer, which stands alone from any human world and has no power of existence to human realization. To sum up, language must entail some information and power to produce it in order to convey its functional meaning. Language is a mass of information so that a language that does not contain information as meaning should not be language. Humans would normally ignore its existence.

Although humans have language as one of their communication tools used frequently in their lives, they cannot readily make a new language because quite many humans hate to accept new rules and large information at once in their daily life (Honna, 2008). As quite many humans tend to be “language conservatists” in that sense, they do not normally want and even need complicated and large information within their daily life, so the power of their languages must be well-formed and generated effectively from their brains to the outer world. I would like to point out this effectiveness of the language production from the language faculty in the human brain. My question is “*how can humans control and recognise their power of information so effectively in their language?*” To answer the question, I first make a new

syntactic theory of language called “Digital Construction Grammar.” In this theory, I will examine structures of language with a binary concept that relates to the digital concept applied to several technologies in the world such as computers and other electronic devices. Applying the binary concept to language makes it much easier to conduct research on how information processes in language than taking conventional linguistic approaches, inasmuch as power of information can often be understood with defined numbers in order to handle it scientifically. The 17th century philosopher and mathematician, Gottfried Leibniz, extolled how we can effectively approach mathematics with the binary concept because of its logical concept of minimalism which just contains the numbers 0 and 1 (Sato, 1988). Claude Shannon (1937) applied this highly effective use of the binary concept to computers, and his “*Theory of Information*” has now been considered as one of the richest ideas with which we can look at current digital technologies. Shannon proves that power of information can easily be recognised and understood with the binary concept, or we can now call it digital concept. Therefore, taking the binary concept to the power of language gives us room for scientific research in the information processing of human language.

I first proposed my theory that every language has a binary concept which I call the “Digital Concept of Language” in my university thesis (Koga, 2009). This theory originally comes from Chomsky’s empty category principle (ECP) and island constraint (Chomsky, 1986). Following his theories, I theorise that each sentence can be separated by island or I re-name it “area” in order to understand the concept well. For example, the English sentence, “He decided on the boat” can be analysed as “(1) (He 2) (decided 3) (4) (on 5) (the 6) (boat 7) (8).” One can divide this analyzed sentence into at least eight separate segments (islands or areas). I

intentionally put the areas (1), (4) and (8) in the sentence because they are the possible positions for some words “*Did*” and “?”, or semantic function that I will explain now. The areas (1), (4) and (8) have no words, so there is no meaning in these segments. I call this status as the meaning is “off”. In this case, I put the number (0) as “no information can be found”. In contrast, the areas (2), (3), (5), (6) and (7) have particular words and meanings, so I put number (1) in these segments as “information can be found”. Thus, I call this status as the meaning is “on”. Based on my theory, this sentence can be further analysed as 01101110. As I discussed above, this number system represents a binary concept that can be seen in digital technology. I intend to present this idea during the early stages of my research in order to posit the importance of language structures in my binary concept.

If some abstractness of meaning presents itself in sentences, we first examine each segment carefully. For instance, the sentence which I created above can be interpreted in two different ways such as “1, *He decided something on the boat*” and “2, *He decided which boat to choose.*” The underlying deep structure and surface structure in those two different sentences needs examined utilizing the segmentation method that I have proposed. First, the most problematic situation exists in area 4, “(1) (He 2) (decided 3) (4) (on 5) (the 6) (boat 7) (8).” This area represents nothing in one form of analysis, but “something” in another form of analysis. If we consider this in the former case, we can ignore the space and simply interpret it with the first meaning with the digital code as 01101110. However, once we consider it having meaning in the segmented space, we must recognize the place no matter the degree of irrelevance to the whole sentence. Therefore, this time we create a different digital code 01111110. Area 4 now has a 1 as if the segment contains a word or meaning. Actually, it does have “meaning” because

the digital code now reads “on;” therefore, we assign it a value of (1). The meaning lacks an interpretation here because it does not simply specify the meaning. The most important thing that we should consider is that the area 4 does have meaning that is at least part of the sentence although it does not represent an important role in the whole sentence. Hence, the first meaning “He decided something on the boat” is acceptable because it has meaning and it requires no specification.

Digital Construction Grammar further allows us to theorise on the power of each sentence logically and visually. For example, the two different English sentences “For what are you looking?” and “What are you looking for?” have nearly the same meaning, but different power to produce. We examine the first sentence as “(For 1) (what 2) (are 3) (you 4) (looking 5) (6)?” And covert it into binary numbers 111110 which equals 63. In contrast, we analyze the second sentence as “(1) (What 2) (are 3) (you 4) (looking 5) (for 6)?” which converts into binary numbers 011111 which equals 31. Therefore, the first sentence has more power and the second has less. I will assume from the numbers that speakers will widely prefer the second sentence because humans tend not to prefer something too strong or harsh in a short space and tend not to be able to calculate a large number of segments at once. I have not yet determined the exact degree of information (i.e., power) that will make humans most comfortable when interpreting a sentence. Identifying this degree of human perception will also help me to take a further step in my research. The first sentence above is preferred more by some people in some situations. That sentence is traditionally described as a well-formed English sentence by English prescriptivists, because the sentence has more power to produce information which attracts humans to process more information. It should also be stated that the first sentence reflects

the usage of Latin, which prohibits the stranded position of prepositions. (Quirk, Huddleston, Lindstromberg, et al, 1985, 1997 and 2002) To sum up, sentences having larger numbers can produce more information, which we recognise as formal or uncanonical sentences. On the contrary, the sentences having fewer numbers produce less power, but allow humans to more readily interpret the sentences and as such can relax in a particular situation. Since these sentences allow people to communicate with less restriction, these sentences receive preference by more people and are called informal or canonical sentences. This can be considered a result of human perception.

Every word originates from within the human brain. We select appropriate words utilizing our faculty of language through Universal Grammar and put them in their designated space as shown in the sentences above. I will refer to the system that selects specific words as the “Digital Parameter (DP).” The DP is closely related to Universal Grammar and functions as a selection tool for words and helps in the creation of any sentences we produce. It also provides the human brain with the knowledge of power for each word with the numbers 0 or 1. If I mistake not, I believe the DP to be the main source for providing the power of information from the human brain, as discussed above. Regarding Chomsky’s stimulus response, the DP should be naturally endowed in every human being and should reflect their sense of perception. Although the DP is genetically endowed in the human brain, it can change itself in accordance with the direct attention from the human world and their usage of language in a timely manner. Therefore, the DP is not as concrete as Universal Grammar in terms of its function from within the human brain. Despite the fact that Chomsky never envisages syntax as “information” in sentences, my new theory will be able to determine

how much information is required for some expression and how the amount of information affects the production of language from the human brain. Eventually, we will compare the “well-formed sentence” with the “ill-formed sentence”, which gives us a clue for understanding what grammaticality and grammaticalness mean for human language.

However, I still need more research on this theory, because I have yet to connect it to any semantic or phonetic units of language which reflect two of the most important elements contained in any language. Therefore, my future research will require applying my theory to Universal Grammar and the faculty of language in order to discover whether I can find a connection between my new theory and other language units. I mainly chose the English language to research because the binary concept comes from English speaking countries originally, so determining the Digital Concept of Language is somewhat easier than finding it in other languages.

Introduction to the Third Chapter

So far, we have looked into language from the view point of human inner sense. This point of view closely relates to Locke's idea of "Sensation", focusing on the perception from the inside of humans. From this chapter, I shall look into another aspect of human perception that Locke called "Reflection", which relates to the human perception from the outside of humans. Following Hudson's claim that "*language is not sui generis*" (2007), human language does not only reflect human's internal sense such as psychological and biological concerns, but also reflects some outer factors such as sociology and anthropology. Saussure (1983) did not agree with the way that linguistics takes only approaches from language itself. Those approaches had traditionally been dominant in the studies of linguistics amongst Port-Royal grammarians and comparativists before Saussure postulated that language is a result of social contact (Harris, 1993). With his theories of *Parole*, which focuses on what speakers say exactly, and *Langue*, which asks what knowledge language speakers have in their mind, Saussure strongly supported an approach from outside realms of linguistics and related language studies to its environmental factors such as society. His ideas were later used by many linguists such as Edward Sapir, Bloomfield, Chomsky, Lakoff and Hudson, all of whom we now consider *linguistic maniacs*.

In the third chapter, I would like to focus on outer factors of language. Being an English as a second language learner, I have found several complex and difficult functions of English prepositions; thus, I shall mainly discuss some issues on the usage of English prepositions considering the social or "outer" role played in their usage. This chapter asks how people use

English prepositions differently in their own sentences. I gave several questionnaires on English prepositions to college educated students who study English as a foreign language and English teachers in London and Tokyo (2008, 9). According to the research, people from different countries or regions have several different usages of English prepositions. Furthermore, my research reveals that as well as non-natives, natives also have several different opinions and views of using English prepositions in their sentences. Because people from different countries have different approaches to the use of prepositions in each sentence, I need to observe different regions where people speak the same language but the language has somewhat different variations such as British English and American English. I will relate the variations to particular societies that stimulate speakers' behaviour and thinking. Although several linguists such as Lakoff and Lindstromberg discussed some usages of English prepositions, which relate to meta-functional usages of the language such as metaphor in cognitive grammar, they did not much concern speakers' social context to their languages (Lakoff, 1990, Lindstromberg, 1997). Thus, following the results of my research I would like to postulate some theories of English prepositions from speakers' social attitudes in particular environments as well as functions of prepositions themselves. Finally, I propose a theory that will alleviate English as a second language student's (EFL) stress and confusion with prepositions.

Chapter 3

1. Can English Prepositions be Troublesome?

Many people recognise “prepositions” as one of the most complex components of the English language. Most EFL students still have difficulty recognising and using prepositions in English sentences. In recent years, there has been some research into prepositions in English. However, those studies are complex and extremely verbose for those students trying to learn English, because they are only intended to postulate ideas to linguists who focus particularly on problems of language usage and syntactic studies. According to the difficult situation with which EFL students are confronted, I shall discuss some of the most important ideas when thinking about prepositions which may be helpful for all EFL students to recognise prepositions in any situation in English. According to my recent research, which was conducted in University College London and Digital Content University, almost every student has different answers to each question in my questionnaire. In the questionnaire, I asked native and non-native English speakers about their usage of different English prepositions in several different situations. My research reveals that there are many factors that confuse native and non-native English speakers when they use prepositions in English.

First, there are several components which function as if they are prepositions. Prepositions in the English language are defined as a small group of words depending on their sentential context. This small group can also be classified as particles, adverbs, locative auxiliaries, stative predicates, predicators, modifiers, preverbs, adpreps, verbal adjuncts, aspect markers, satellites, intransitive prepositions, or transitive adverbs. (O’Dowd, 1998)

Furthermore, prepositions have two major categories, simple and complex prepositions (Quirk, Greenbaum, Leech, Svartvik, 1972). Prepositions such as *in*, *at*, *for* and *to* are simple ones. On the other hand, prepositions such as *along with*, *in terms of* and *in stead of* are complex ones. Those many preposition-like expressions confuse learners in many ways.

Second, some EFL students are still confused when using prepositions in English contexts. There are mainly two reasons why they have difficulty using prepositions. Firstly, prepositions function in many different ways in sentences. They are prominently used to refer to *time* and *place*. In addition, prepositions can also refer to *cause* and *instrument* meanings which can be difficult to identify (Quirk, Greenbaum, Leech, Svartvik, 1972). A questionnaire about the usage of English prepositions was conducted and given to fifty people living in London, including native English speakers and EFL students. According to this research, many EFL students have strong difficulty distinguishing the difference between *on* and *in*. For instance, when I asked their preference between “She was able to score 990 on the TOEIC test” and “She was able to score 990 in the TOEIC test,” the percentage of people who chose each answer is close to equal. I found a similar result in their preference between “She lives in the street” and “She lives on the street.” Moreover, the difference of the two sentences “The film is interesting for me” and “The film is interesting to me” confuses them more. In fact, even native speakers have different answers for this question. From the native speakers’ perspective, there are some interesting results that we can see. According to the BBC Learning English Website, which is an authority on Standard English, using *for* is the most acceptable way in this context. However, according to some research of usage of contemporary English, there are still more people who would prefer to use *to* than people who would prefer to use *for* in the United

Kingdom (Algeo, 2006). On the other hand, interestingly, there are more people who would prefer to use *for* than those who would prefer to use *to* in this context in the United States of America. Hence, the use of prepositions amongst native speakers is also ambiguous. The examples above clearly reveal that some social factors affect people's way of using English and their preference of one expression over another. (I will further discuss the relationship between social factors and language usage in the next chapter.) The difference of usage between different cultures makes comprehension of certain structures even more complex for both native and non-native speakers.

Third, the existence of particles and phrasal verbs definitely makes it difficult for people to understand the usage of prepositions. For example, *up*'s in sentences such as "*I ran up the hill*" and "*I ran up the bill*" cannot readily be identified as to whether these are used as prepositions or particles. (Liles, 1987:19) *Up* in the former sentence functions as a preposition; however, *up* in the latter functions as a particle. Furthermore, because the definition of the usage between prepositions and particles has not clearly been stipulated, it becomes much worse for EFL students to learn. We can clearly distinguish between the two *up*'s in both sentences in that *up* functioning as a preposition cannot be moved after the direct object, whereas *up* in the second sentence, which functions as a particle, can be moved after the direct object. Hence, we can say "I ran the bill up," but cannot say "I ran the hill up." (O'Dowd, 1998) This perplexity between prepositions and particles can hardly help non-native speakers of English to recognise them.

Unfortunately, it does not seem that many grammar books point out and elucidate these problems of prepositions. Therefore, EFL students just need to memorise several functions of

prepositions. This method can make them tired and bored when they learn prepositions. That is one of the reasons why some EFL students still have difficulty recognising prepositions and simply do not like them. In addition, phrasal verbs confuse them for understanding prepositions as well. Functionally, the root of a phrasal verb is used alone, but its meaning in a phrasal verb is quite different from its meaning when used alone. Thus, people need to acquire the simple transitive root *take*, and also phrasal verbs such as *take after*, *take up* and *take on*. The meaning of a phrasal verb often cannot be inferred from the meanings of its constituent root and preposition; it must then be regarded as a separate lexeme. Therefore, people need to distinguish verbs that consist just of a root such as *take*, *mention*; those that consist of root plus preposition, where the root cannot be used alone such as *refer to*; and those that those that consist of root plus preposition, where the root can be used alone, but with a different meaning such as *take after*, *take up* and *take on* (Dixon, 2005). These distinctions definitely make EFL students further struggle with understanding prepositions.

2. The Cues to the Problems of Prepositions from Sentimental Factors

Several linguists and grammarians have already tried to answer the questions as to what exactly English prepositions mean and how they are used in sentences by optimizing several approaches such as syntactic, semantic and pragmatic approaches. For example, the problem of the semantic distinction, which is concerned with prepositions between “The film is interesting *for* me.” and “The film is interesting *to* me.” can be identified, if we have both syntactic and semantic approaches to the sentences. Firstly, to solve the problem, we need to analyse some cases which can use only either *for* or *to*. For example, cases where we can only put *for* in sentences are **build for**, **pay for**, **find for** and **buy for**. The common semantic feature of these phrases is to focus on one’s emotion and assistance from someone. On the other hand, cases where we can only put *to*, for example, are **give to**, **show to** and **lend to**. These phrases emphasise movement and direction from someone or something to others. These different semantic features can help us identify the difference of the two sentences between “The film is interesting *for* me” and “The film is interesting *to* me.” Thus, the former sentence with *for* focuses more on the view point of “the film” and some “emotional effect” that is influence from the film. In contrast, the latter sentence with *to* focuses on the view point of “*me*” and the “movement” that is influence from the film.

My proposal to solve problems where two sentences have very similar structures and meanings but are not exactly the same expressions, is that we try to find some more examples

in which we can put either preposition (the above case is **for** or **to**), but cannot put the other in the sentences and vice versa. Those extra examples will give some clues to each preposition's meaning and function and can be distinct from other prepositions.

Next, I call up the question why particular nationalities prefer to use some expressions over others, and other nationalities use them in different ways. To find the answer, we first need to understand *to whom speakers communicate and where they come from*. Even amongst the same language, different people that have grown up in different countries, places or communities have various usages (Algero et al., 1985, 2003 and 2006), which seems to be a natural phenomenon for human language. As Saussure and other sociolinguists such as David Crystal claimed that social environment must reflect humans' use of language. As I have tried to avoid having a bias towards particular nationalities, I mainly take an approach from the perspective of how environmental factors affect speakers' habits and intentions, not from the speakers themselves.

To understand the problem well, I would like to compare the so-called *American English* that is English spoken by people that have grown up in the United States or American communities or had an American education and *British English* spoken by people in the United Kingdom or other British communities or had a British education. Americans prefer to say "*I am **on** the team.*" In contrast, British people prefer to say "*I am **in** the team.*" The preference difference between "**on**" and "**in**" is understood when we consider how they think of themselves as social characters. Americans would probably be more willing to remain as individuals and keep their space separately from others on the team. Therefore, they are just on the surface of the team (metaphorically speaking). On the other hand, British people would

probably be more willing to play with other teammates and make their space in the team, so that they consider that they are in the circle of the team (metaphorically speaking). Thus, Americans use “on” which has the core meaning of a two-Dimensional relationship, and British use “in” which has the core meaning of a three-Dimensional relationship. This concept has support in several documents over the past fifty years. For example, Jeremy Rifkin (2004) pointed out that the meaning of freedom for the Americans comes from the idea of their independence from others. He therefore considers them the most independent people in the world. In contrast, Europeans, including the British, find their freedom with their reversion to a particular community or society. He thus considers them people of social harmony. Rifkin’s idea, therefore, supports the characteristics of the two nationalities which I apply to their use of language.

Although there is some precedent in the research that focuses on the relationship between language and culture, this research does not often seek to determine how people’s use of language is controlled by their living environment. For instance, there are a lot of references noting that [*the British would prefer “in” to “on” when both are possible to use in sentences but the Americans would do vice versa.*] However, they rarely note the reason why and how they would do so. Hence, my future research will continue to seek the further define the relationship between language structures and the speakers’ environment within a given society in order to thoroughly look into speakers’ language performance. I will also research into other languages such as Japanese, Chinese and Thai in order to find more evidence that can provide us with the cultural (environmental) influence to language usage (people’s performance). I will particularly focus on languages from Asian countries because it is often

said that Asian countries have quite different cultures and customs from those of Europe and America with the influence of Confucianism that indoctrinates the morality of family relationships. My research (2008) in London already provided some distinction of using English sentences between Asians and Europeans. For instance, when Asians and Europeans were asked their preference of two different sentences *“The film is interesting for (to) me.”* where the word “film” is stated as a subject and *“I found the film interesting.”* where the first person singular noun “I” is stated as a subject, more European students of English prefer the former. In contrast, more Asian students prefer the latter. That is because Asian students are often embarrassed to express themselves as a subject in their language. This idea must relate to the Confucian thought of “family resemblance.” In this belief, people must refrain from demonstrating their strong existence and should devote themselves to their social community with benevolence. (The Analects, republished in 1990) To sum up, comparison between Asian languages and European languages will postulate interesting distinctions between peoples and their cultures in terms of their language performance. I also postulate that if we observe the social and external factors that affect speakers’ attentions, we will be able to solve many problems with the abstractness of language such as English prepositions.

3. Applying the Theories to Second Language Acquisition

I have explained some problems of prepositions so far. Now, I should like to comment upon my new approach to these problems. Some historical approaches to prepositions such as syntactic, pragmatic and semantic approaches cannot completely solve the problems for all EFL students. As discussed above, most of the research is intended for people in professional positions such as linguists and teachers, not students. Although some of the semantic differences which are concerned with prepositions can be clarified, such as the difference between two sentences “The film is interesting *for* me” and “The film is interesting *to* me,” where we have both syntactic and semantic approaches, there still remain several prepositional problems. For instance, the difference between two sentences “What do you think *of* Pizza” and “What do you think *about* Pizza” cannot be identified even when we take several approaches, which I mentioned above, to the two sentences because the meanings of those sentences are simply concerned with social situations. The former sentence with *of* can be used where a person asks for or suggests pizza to another person to have such as in a restaurant or at one’s house. In contrast, the latter sentence with *about* gives opinions concerning pizza to another person. Therefore, to solve some problems of prepositions, social factors need to be considered. In fact, this idea is not new. Saussure already expounded the relationship between languages and social factors (1983). However, when teaching English prepositions few teachers focus on these social factors with their education. Social factors also deal with human psychological concerns; thus, EFL students are exposed to both cultural and psychological matters within their studies of English, which follows what Locke referred to in his ideas of

“Sensation” and “Reflection”. This measure does not address the difficulty, as some English teachers claim, that “too much learning just makes students bored and confused.” Many students actually enjoy studying their target language’s culture and natives’ minds. My research also reveals that many successful English learners do take this approach to learning and are willing to connect these ideas to their studies of the language. Therefore, English teachers should often provide situational information where prepositions are used by natives and keep asking how the prepositions function in particular occasions. Explaining from the native speakers’ mind, customs and social background will deepen EFL students understanding of the given structure. In addition, every teacher should try to obliterate the fear that students have when they use English. Too much correction of students’ language to reflect native use will lead to a great deal of hesitation from them when using the language. The important point is that no language has perfect and concrete usage, or, as it is sometimes called, “standard usage”.

According to my research (2009), EFL students strongly need some visualisation of how prepositions can function in sentences when they are confronted with difficulties using prepositions. Every preposition can embody different systems; for instance, ‘at’ can imply a zero dimensional scale that people can express as one point of a place. ‘On’ has a two dimensional scale which has width and length, and also implies that something can be touched or is tangible in some way. Moreover, ‘in’ expresses a three dimensional scale where people can imagine a realistic space that speakers mention. These visualisations of prepositions are necessary for EFL students rather than just memorising them. Thus, students should be trained to acquire effective imagination skills by taking extra or chained classes such as fine

arts, communication and music studies where students will improve their own creativity. It is a shame that many English classes do not take that approach. There is some evidence of the relation between language and creativity such as music (Anvari, 2002, Slevc and Miyake, 2006 and Patel, 2008) Patel (2008) points out that *“musical training enhances sensitivity to vocal emotions in a foreign language.”* with some evidence from research in the Tagalog language. He also claims that *“the researchers found that musical training did improve the ability to identify certain emotions, particularly sadness and fear.”* That provides the possibility of connecting moral education with music and language. One of the reasons why so many English classes ignore the approaches mentioned above may be that there is no concrete evidence for the relation because of the lack of empirical data and research. Therefore, the advancement of this field should be expedited not only for Second Language Acquisition studies (SLA) but also for a greater understanding of human nature as well.

Lindstromberg (1997) posits that focusing on core meanings of each preposition gives a great benefit to EFL students. He points out that every preposition has its core meanings and also carries different functions that can be originally derived from the prepositions core meanings. EFL students should know those meanings of prepositions first and then, they can apply the meanings to particular usages. I have already illustrated some examples above such as *at*, *on* and *in*'s dimensional factors with visualisation. Those core meanings cannot be readily identified by students because there are some prepositions which have more than 20 different usages and meanings, but with teachers' thorough understanding of prepositions, students will more readily be able to distinguish them and find core meanings.

To conclude, problems of English prepositions still seem to be difficult to solve. My

research reveals that the usage of English prepositions amongst both native speakers and non-native speakers varies in many ways. This result patently shows difficulty using prepositions. However, if we have different views and approaches to prepositions such as the viewpoints of social concerns and visualisations including the focus on students' creativity, we may help people to understand prepositions more easily.

Concluding Remarks

For the Future Explanation

I have discussed and pointed out two main approaches to language studies. One is from human internal factors and the other is from human external factors. The two points following Lock's idea of "Sensation" and "Reflection" that should now have a large role in linguistics studies. Thanks to my binary concept approach to language structures, we can easily detect the *power of information* that each sentence has. This explanation helps us comprehend why humans prefer making particular expressions to others. Moreover, this theory of language will give us a better understanding of how human perception works towards information from outside, which can be applied to the real world such as how companies produce their products and advertisements effectively for their customers. The theory now asks one question "*Is there any clear distinction in the power of information with which human beings feel comfortable or uncomfortable with their languages?*" The answer is still unknown; thus, my research further challenges exactly how the amount of information in languages affects humans and makes them feel better or worse. This research is important in terms of envisaging human's universal factors: anger, sadness, joy, pleasure and so forth. If we scientifically discover the answer to when, how and why humans express the above perceptions, it will provide humans with a clearer vision of the world around them. Moreover, I need to explore other languages to further test my binary concept of language as well as the English language in order to find whether there is a common factor for human perception in each language. Regarding my ignorance of semantic and phonetic approaches with the binary concept, I would also like to find some

connection between them and my Digital Concept of Language. The Digital Parameter theory connects to and stimulates the humans' universal faculty, the language faculty in the human brain. The DP functions as a selective tool through Universal Grammar; therefore, the discovery of a connection between the faculty and DP will be important to my studies.

The close relationship between languages, humans and their social environment must be taken into consideration in linguistics. Language studies must also focus on a wide range of fields of studies as Hudson's claim of "*Language is not sui generis*," in accordance with the current tendency of interdisciplinary studies in the world. The last chapter discussed the interaction between people's usage of language and their living environment (culture). That research extrapolates that understanding languages requires more understanding of "external chain." Patel (2008) and Levitin and Tirovolas (2009) already postulate some important connections between language studies and music such as their phonological and pitch similarities. Hence, taking interdisciplinary approaches will solve some current problems with which learners of language are confronted, and may be applied to the SLA (Second Language Acquisition) studies.

If I further advance what Chomsky claims that "*linguistics is part of psychology*," I will infer that linguistics (language) is part of the natural world (the universe). A lot of research from Chomsky, Lakoff and other linguists has already revealed that language must closely be connected with humans' thought from cognitive domains and even humans themselves. Therefore, there should be room for every linguist to study biology, medicine and whatever else relates to the study of the human mechanism. It is said that language that contains multi-functional and complex systems can only be found in humans. Therefore, some

unsolvable questions of humans will be understood if the human language is clearly explained. In fact, that is one of the primary questions why people study linguistics. The connection between human languages and the world would also give the answers to two philosophical questions, “*what is the world in which we live*” and “*how did the world come to be?*” That is because our world cannot be separated from humans. We live in the world and everything we do relates and affects what we call “the world”. As my research reveals, human usage of language varies depending on where they live. Therefore, the close connection between languages (humans) and the world (space) can be found.

To sum up, the close connections between language, humans and space suggest to me two possible ideas, that is, “humans are languages” and “languages are the universe.” Then, to use a deductive method to these two speculations, I finally conclude that “humans are the universe.” This last statement must give us the answer to what the universe is. Because I still need a lot of research supporting these connections, I need first to discover the connection between humans and languages to which Chomsky and other linguists have already given a lot of clues by envisaging humans’ biological connection with languages. I will theorise a new field of linguistics “Cosmolinguistics” in order to approach these last statements in the future, which I will need to satisfy my linguistics research.

References

- Aarsleff, H. (1981) *From Locke to Saussure*, London: Athlone
- Aarts, B. (2004) *Fuzzy Grammar*, Oxford: Oxford University Press
- Aarts, B. (2007) *Syntactic Gradience*, Oxford: Oxford University Press
- Algeo, J. (2006) *British or American English?* Cambridge: Cambridge University Press
- Atalay, B. (2006) *Math and Mona Lisa*, Tokyo: Kagaku Dojin, in Japanese
- Breal, M. (1891) *Le langage et les nationalites*, 108 (1 December), 615-639.
- Brown, K. and Law, V. (2002) *Linguistics in Britain*, Oxford: Wiley-Blackwell
- Carston, R. (2002) *Thoughts and Utterances*, Oxford: Blackwell Publishing
- Carter, R. (2002) *Language and Creativity*, London and New York: Routledge
- Chomsky, N. (1957) *Syntactic Structures*, Berlin: Mouton
- Chomsky, N. (1965) *Aspects of the theory of Syntax*, Cambridge: MIT Press
- Chomsky, N. (1968) *Language and Mind*, New York: Houghton Mifflin Harcourt P
- Chomsky, N. (2002) *On Nature and Language, with an essay on*
“The secular priesthood and the perils of democracy” (edited by Adriana
Belletti and Luigi Rizzi), Cambridge: Cambridge University Press
- Chomsky, N. (2004) ‘Biolinguistics and the Human Capacity’
<http://www.chomsky.info/talks/20040517.htm>
- Accessed Feb 18, 2008
- Chomsky, N. (2009) *Cartesian Linguistics the third edition*, Cambridge:
Cambridge University Press

- Cole, K.C. (1998) *The Universe and the Teacup*, London: Little, Brown and Company
- Cowie, A P and Mackin R. (1979) *Oxford Dictionary of Current Idiomatic English*,
Oxford: Oxford Univerisity Press
- Daniel, J. L. and Anna, K. T. (2009) 'Current Advances in the Cognitive Neuroscience of Music',
the journal for the year in cognitive neuroscience at McGill University
- Darwin, C. (2006) *On the Origin of Species*, New York: Dover
- Dixon, R.M.W. (2005) *A Semantic Approach to English Grammar the second edition*,
Oxford: Oxford University Press
- Eizo-Jyoho-Gakkai. *The Encyclopedia of Media Jargons* Tokyo: Corona, in Japanese
- Ellis, R. (1997) *Second Language Acquisition*, Oxford: Oxford University Press
- Ferreira, P G. (2007) *The State of the Universe*, London: Phenix
- Fetzer, J H, Shatz, D and Schlesinger, G N. (1991) *Definitions and Definability:
Philosophical Perspectives*, Dordrecht, Boston and London:
Kluwer Academic Publishers
- Halliday, M and Matthiessen, C M.I.M. (2004) *An Introduction to Functional Grammar*,
London and New York: Hodder Arnold
- Harris, R.A. (1993) *The Linguistics Wars*, New York: Oxford University Press
- Hiroshima Peace Culture Foundation. (2009) *Eyewitness Testimonies Appeals From The
A-bomb Survivor*, Hiroshima: Nakamoto Sogo Printing
- Honna, N. (2008) *English as Multicultural Language in Asian Contexts: Issues and Ideas*,
Tokyo: Kuroshio Pubilshers
- Horgan, J. (1997) *The End of Science*, New York: Broadway Books

- Huddleston, R and Pullum, G K. (2007) *A Student's Introduction to English Grammar*,
Cambridge: Cambridge University Press
- Huddleston, R and Pullum, G K. (2002) *The Cambridge Grammar of the English Language*,
Cambridge: Cambridge University Press
- Hudson, R. (2007) *Language Networks*, London: Oxford University Press
- Ikeda, N. (2006) 'Chomsky' His IT and Economics View on the Internet Website
(The Japanese Language)
<http://blog.goo.ne.jp/ikedanobuo/e/0168a99c2df1021bf8cbec01735cd7e6>
Accessed Mar 1, 2008
- Jenkins, L. (1997) 'Biolinguistics – Structure, Development and Evolution of Language'
<http://fccl.ksu.ru/papers/gp008.pdf>
Accessed Feb 18, 2008
- Jeremy, R. (2004) *The European Dream*, New York, Penguin
- Jones, K. and Ono, T. (2008) *Style Shifting in Japanese*,
Amsterdam: John Benjamins Publishing Company
- Kant, I. (2003) *Critique of Pure Reason (Philosophical Classics)*, New York: Dover Publications
- Kato, T. (1992) *Spatial Ecology*, Tokyo: Shinyo-sya (The Japanese Language)
- Kitahara, Y. (2002-4) *Meikyo Japanese Dictionary*, Tokyo: Taishu-kan, in Japanese
- Koga, K. (2008) 'Evaluating Chomsky's language structure'
UCL research project in Term 2 for the Diploma in English for Academic
Purposes Course
- Koga, K. (2008) 'Can English Prepositions be Troublesome?'

UCL research project in Term 3 for the Diploma in English for Academic

Purposes Course

Koga, K. (2009) 'A Digital Communication Theory with a History of Academia since Thales'

DHU Graduate Thesis

Kymlicka, W. (2002) *Contemporary Political Philosophy*,

Oxford: Oxford University Press

Laertius, D. (1985) *Lives and Opinions of Eminent Philosophers*, Tokyo:

Iwanamibunko, in Japanese

Lakoff, G. (1990) *Women, Fire and Dangerous Things*,

Chicago and London: The University of Chicago Press

Lamberts, K and Shanks, D. (1997) *Knowledge, Concepts, and Categories*,

Cambridge, Massachusetts: The MIT Press

Lightman, A and Brawer, R. (1990) *Origins*, Cambridge,

Massachusetts: Harvard University Press

Lindstromberg, S. (1997) *English Prepositions Explained*,

Amsterdam: John Benjamins Publishing Company

Lloyd, S. (2006) *Programming the Universe*, New York: Alfred. A. Knopf

Locke, J. (2008) *An Essay concerning Human Understanding*,

Oxford: Oxford University Press

Nii-Mura-Shuppan. (2008) *Kojien Japanese Dictionary*,

Tokyo: Iwanamishyoten

O'Dowd, M.E. (1998) *Prepositions and Particle in English*,

New York: Oxford University Press

Ooe, K. (2006) *Against Violence*, Tokyo: Asahi-Shinbunsha, in Japanese

Palmarini M. P, Uriaqereka J and Salaburu P. (2009)

Of Minds and Language, Oxford: Oxford University Press

Patel, D. A. (2008) *Music, Language, and the Brain*,

New York and Oxford: Oxford University Press

Pater, W. (1873) *The Renaissance*, London and Glasgow: Collins

Piker, S. (1994) *The Language Instinct*, New York: William Morrow and Company

Quirk, R, Greenbaum S, Leech G and Svartvik J. (1972) *A Grammar of Contemporary English*,

Essex: Longman

Quirk, R, Greenbaum S, Leech G and Svartvik J. (1985) *A Comprehensive Grammar of the*

English Language, Essex: Longman

Robinson, I. (1975) *The New Grammarians' Funeral*, Cambridge: Cambridge University Press

Russell, B. (1941) *Let the People Think*, London: Watts]

Sato, S. (1988) *Mathematics for Digital Technology* Tokyo: Kodansya, in Japanese

Saussure, F.de. (1983) *Course in General linguistics*, London: Duckworth

Skehan, P. (1989) *Individual Differences in Second Language Learning*,

London and New York: Arnold

Smith, N. (2005) *Chomsky*, Cambridge: Cambridge University Press

Students of Confucius. (1999) *The Analects*, Hunan: Hunan People's Publishing House,

republished edition

Swan, M. (2005) *Practical English Usage*, Oxford: Oxford University Press

Takami, K. (1990) “REPOSITION STRANDING: From Syntactic to Functional Analysis”

Doctoral dissertation Tokyo Metropolitan University, in Japanese

Takayama, H. (2000) *Hiroshima*, Hiroshima: Biltmore Press

Taylor, J. R. (2002) *Cognitive Grammar*, Oxford: Oxford University Press

Tapscott, D. (1996) *Digital Economy*, Tokyo: Nomura-sohgoh-kenkyujo, in Japanese

Unknown person (2007) ‘British Empiricism’

<http://note.masm.jp/%A5%A4%A5%AE%A5%EA%A5%B9%B7%D0%B8%B3%CF%C0/>

Accessed Jun 29, 2009, (the Japanese Language)

Vilenkin, A. (2006) *Many Worlds in One*, New York: Hill and WANG

Widdowson, H.G. (2003) *Linguistics*, Oxford: Oxford University Press

Williams, T.C. (1993) *Kant’s Philosophy of Language*,

New York, Ontario and Dyfed: Edwin Mellen Press

Wittgenstein, L. (1953) *Philosophical Investigations*, p.107, cited by Robinson, I (1975)

The New Grammarians’ Funeral, p.85

Yamamoto, N. (1983) “Research on the Binary Concept in Digital Device”

Doctoral dissertation at Keiyo University, in Japanese

Yoon Ok, L. (2003) “The Same Concepts of Studies amongst Prepositions in English and Aspects in Japanese and Korean”

Doctoral dissertation at OsakaUniversity of Foreign Studies

Pythagoras (A.D.582~A.D.496)