



The Biological Basis of Language: Science and Creationism Interface

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Abstract

Many studies on language origin are based on various approaches; most of which are independently analyzed. This paper seeks to analyze how science and creationism interact in giving answers to the biological basis of language, its development and use. The paper hypothesizes that science and creationism complement each other in providing answers to questions that relate to human language. Secondary data were primarily used in the analyses. This paper is guided by four theories; the innateness/ nativism theory, the cognitive theory, the interactionist theory and the creationism theory. Findings show that there is no contradiction between science and creationism in explaining the biological basis of language, its development and use; the two interact and complement each other.

Keywords: Biological basis of language, creationism, interface, science

INTRODUCTION

The title of this paper, '*The Biological Basis of Language*' is borrowed from Lenneberg's 1967 work on Language and Biology. This paper looks at the interface between linguistics, biology, psychology, the African belief and Creationism that is based on God's word. In this paper, we adapt Lenneberg's definition of language in order to understand better the relationship that holds among these facets. Lenneberg (1967) defines language as an aspect of human biological nature that needs to be studied in the same manner as their anatomy. This definition puts emphasis on the human physiological and psychological aspect.

Language is species specific; its acquisition and use depend on being human and not on intelligence or the size of the brain; and wherever human beings exist, language also exist, the two are inseparable. With regard to the same, Chomsky (1986, p. 29) argues that "there is a system of principles, conditions, and rules that are elements or properties of all human languages...the essence of human language." He further argues that language is a sole property of the human mind and that all human beings share part of their knowledge of language; which is very specific to them. Thus, whereas both humans and animals can communicate, it is only humans that use language to communicate. The specificity of language to humans is demonstrated in the scriptures, where we see that after creating man, God commanded Him to name animals and whatever name that he

gave, so it became. Adam was able to do so because he had language. However, God, being all knowing and all powerful, is able to do that which no human being can do or least expect as demonstrated in Numbers 22: 27- 30 where God caused a donkey to speak:

²⁷ When the donkey saw the angel of the Lord, it lay down under Balaam, and he was angry and beat it with his staff. ²⁸ Then the Lord opened the donkey's mouth, and it said to Balaam, "What have I done to you to make you beat me these three times?" ²⁹ Balaam answered the donkey, "You have made a fool of me! If only I had a sword in my hand, I would kill you right now."³⁰ The donkey said to Balaam, "Am I not your own donkey, which you have always ridden, to this day? Have I been in the habit of doing this to you?" "No," he said.

Likewise, the snake is seen to converse with Eve in Genesis 3: 1- 5:

¹ Now the serpent was more crafty than any of the wild animals the LORD God had made. He said to the woman, "Did God really say, 'You must not eat from any tree in the garden?'"² The woman said to the serpent, "We may eat fruit from the trees in the garden, ³ but God did say, 'You must not eat fruit from the tree that is in the middle of the garden, and you must not touch it, or you will die.' " ⁴ "You will not certainly die," the serpent said to the woman. ⁵ "For God knows that when you eat from it your eyes will be opened, and you will be like God, knowing good and evil".

The two are among the many miraculous acts of God that are beyond human understanding. This does not in any way contradict the interface between science and Creationism but it confirms the fact that God is all powerful, able to do far beyond what humans can think or comprehend.

Language is unique in the sense that it has characteristics that are absent in other forms of communication; these include the unique property of displacement. Unlike animal communication, human language can be used to communicate about events that are far removed in time and place. Although bees have been shown to possess this property, it is quite limited in the sense that they can only communicate about an entity or event in the immediate past and not beyond. "It is this property of displacement that allows the humans, unlike any other creature to create fiction and to describe possible future worlds" (Yule, 1996, p. 21). Language is also unique in the sense that it has the feature of arbitrariness, where there is no natural connection between the sign (linguistic form) and the signified (object/ meaning). Language is also productive; it is creative or open-ended in that novel utterances are always created by language users; they do not have a fixed set of signals, which is characteristic of other animals. Cultural transmission is another characteristic that is specific to human language; thus, language is acquired in a cultural setting; it is not inherited. A new born exposed to any language will acquire the same and not necessarily the parents'; this is not exhibited by other animals. Language is also discrete in that it makes use of sounds that are linguistically specific and meaningfully distinct. Duality is a unique property of language, where language is organized in two levels simultaneously; at one level, it occurs as a distinct sound and at another, as distinct meaning in different contexts. Linguists agree that these are the core features of human

language that make it unique and species specific. None of the animal communication system shares any of these design features of human language.

The uniqueness of humans and by extension language, is acknowledged by the Psalmist who says in Psalm 139:14: *"¹⁴ I will praise You, for I am fearfully and wonderfully made; Marvelous are Your works, And that my soul knows very well."* The Psalmist acknowledges not only the uniqueness of human beings but the entire creation of God; including language. The uniqueness of human beings is seen in their capacity to think, speak and process information; attributes that are so specific.

Despite the fact that animals can communicate, they do not have language similar to that of humans. Evidence from studies done on animals like apes, gorillas and chimpanzees that have been taught to use human language show that these animals communicate with a wide range of vocal calls but they cannot speak; they have no linguistic capacity (Yule, 1996). In emphasizing the fact that language is species specific, Chomsky in Horgan (1990) says "saying that apes can acquire language because they can learn simple signs...is like saying that men can fly because they can jump".

The uniqueness of man and by extension language is seen from the creation story in Genesis 1:24- 27, where it is shown that it is only humans that are made in God's image and likeness and it is only humans that are rational; Genesis 1: 24-27:

²⁴ Then God said, "Let the earth bring forth the living creature according to its kind: cattle and creeping thing and beast of the earth, each according to its kind"; and it was so. ²⁵ And God made the beast of the earth according to its kind, cattle according to its kind, and everything that creeps on the earth according to its kind. And God saw that it was good. ²⁶ Then God said, "Let Us make man in Our image, according to Our likeness; let them have dominion over the fish of the sea, over the birds of the air, and over the cattle, over all the earth and over every creeping thing that creeps on the earth." ²⁷ So God created man in His own image; in the image of God He created him; male and female He created them.

Being created in God's image means that humans have so much in common with God; including having language, which in itself is specific to humans.

The uniqueness of human beings is further revealed in Hebrews 2:7: *⁷ You have made him a little lower than the angels; You have crowned him with glory and honor, And set him over the works of Your hands.* The uniqueness of human language affirms what is written in the scripture about the position of human beings in God's creation; that they were created above animals and all other creatures and that human beings were given power to dominate all.

There are numerous languages in the world that seem to be superficially different with regard to structure. These languages are mutually unintelligible and by all definitions, they all seem to be different systems. However, despite their superficial variation, within the underlying, all languages are the same. Like Chomsky (1986), Pinker (1994) believes that there is a common underlying rule over which the language is built; that is, the universal grammar (UG); that language has its own intricate mental software and that there is a universal design to the rest of the human minds. According to Pinker (like

Chomsky), learning of language is not possible without this innate mechanism. The two scholars are opposed to the imitation theory.

Linguistically, all languages are the same with regard to their potential expressive power and grammatical complexity and as such they all serve their users sufficiently well. Evidence of inherent sameness in language is revealed through the story of the Tower of Babel, where it is recorded that initially, human beings spoke one language until they disobeyed God, that is when He confused their language; Genesis 11:1, *1" Now the whole world had one language and a common speech".* It is not surprising that linguists who subscribe to the innateness theory agree that there is a universal grammar of language. This is all about the initial language that God the creator gave to human beings before diversity in language emerged.

Chomsky (1986) is the one who came up with the idea of the innate biological endowment, which enable humans to acquire language rapidly and efficiently in the first years of life. According to Chomsky, the origin of language is a case of evolutionary biology; it is about humans being genetically endowed with species specific language faculty. This predisposition for language makes it possible for children to acquire any language that they are exposed to as long as their neurophysiological organs are intact; they are never taught.

So far, there is enough evidence to show that language is innate; it is part of human nature. The scientific evidence available confirms what the word of God says about man and language; it confirms that indeed God created man with the innate ability to acquire and use language. This is observed right after God created man, He engaged him in a conversation, meaning that Adam already had the ability to understand, he had language; Genesis 1: 26- 30:

26Then God said, "Let Us make man in Our image, according to Our likeness; let them have dominion over the fish of the sea, over the birds of the air, and over the cattle, over all the earth and over every creeping thing that creeps on the earth." 27So God created man in His Own image; in the image of God He created Him; male and female He created them. 28Then God blessed them, and God said to them, "Be fruitful and multiply; fill the earth and subdue it; have dominion over the fish of the sea, over the birds of the air, and over every living thing that moves on the earth." 29And God said, "see, I have given you.

It is evident that in the first place, God the father, God son and God the Holy Spirit had language and the moment He created the first human being, He started conversing with Him right away. This means that the first human being already had the ability for language and all he needed was a rich linguistic environment that was provided by God the father, God the son and God the Holy Spirit. Thus, God Himself had language and when He created man and woman, He created them with the ability for language use. From there henceforth, God was and has always been in conversation with human beings. Such conversations are observed many more times between God and humans, see Genesis 3: 8- 19.

This paper therefore sets out to show the relationship between the scientific approach that focuses on the biological basis of language and the Biblical perspective on the same.

The paper gives evidence of the biological basis of language and it goes ahead to show how this evidence confirms what the Bible says about the language aspect. For any questions with regard to language that science is unable to answer, the answer is with God, the creator of all; including human beings and language.

Theoretical Framework

Over the years, many theories of language origin, development and use have been put forth. However, almost all of them have been contested. So far, no one theory can sufficiently explain how language began, how it is acquired, how it develops and even how it is used by humans. Three theories, namely; the innateness/ nativism, the cognitive, the interactionist and the creationism theory have been used in this paper.

According to innateness theory (Chomsky, 2000), acquisition of language is a genetically endowed biological system of rules and principles through which humans acquire an internalized knowledge (I- language). Thus, children have inborn/ innate capacity/ faculty for language acquisition that is biologically determined. Like Chomsky, Pinker (1994) agrees that in the acquisition process, human beings start with something in the mind; they never start with an empty slate. Nativists view language as a fundamental part of the human genome; they view language as a trait that makes human beings be considered as human and its acquisition is a natural process of maturation, (Goodluck 1991).

In this theory, Chomsky (2000) believes that children are preprogrammed for language; that they have the language acquisition device which is used as the mechanism to work out the rules of language. Further, that all human languages have shared principles; that is, the universal language properties/ universal grammar (UG); which make it possible for them to acquire and use language appropriately without instruction. Chomsky (2009) goes ahead to explain that language acquisition device (LAD) is a postulated organ of the brain that is supposed to function as a device for learning language. The innate ability makes language acquisition and learning easier than it would have otherwise been. According to the theory, language learning is not something that a child does, it is something that happens to the child; that is, in an appropriate linguistic environment. To Chomsky, language acquisition is a matter of growth and maturation of relatively fixed capacities under appropriate external conditions.

LAD is common to all children. Chomsky (1977, p. 78) observes, "all children share innateness, all children share the same internal constraints, which characterize their grammar". This explains the uniformity in language acquisition process where children acquire language in the same way; they go through the same acquisition stages, they make similar errors and they all observe the critical period of language acquisition.

Like Chomsky, Lenneberg (1967) agrees that language is innate but adds that there is a critical period for language acquisition; this is before the age of puberty. This is a time frame when a child can effortlessly acquire language as long as they are exposed to a rich linguistic environment.

Pinker (1994), like Chomsky believes that LAD is a set of language learning tools, intuitive at birth in all children. This, according to Pinker is the UG, a set of principles and

adjustable parameters that is common to all human languages. Likewise, Humboldt (1999) agrees with Chomsky on the fact that language cannot be taught but it can only be awakened in the mind.

In this paper, the innateness/nativist theory is used to show how human beings are biologically wired to acquire and use language; a property that is unique to humans.

The cognitive theory, whose proponent is Piaget (1936), is a developmental stage theory of language. Piaget's theory has two main strands: i) an account of the mechanisms through which cognitive development takes place. ii) account of four main stages of cognitive development through which children pass. According to Piaget (1936) cognitive development explains how a child constructs a mental model of the world. To him, cognitive development is a process, which occurs due to biological maturation and interaction with the environment; child development too is determined by biological maturation and interaction with the environment.

Piaget (1936) proposes that children's language reflects the development of their logical thinking and reasoning skills in stages; with each stage having a specific name and age reference. Focus in this theory is on the relevance of the child's mental development in the acquisition process; that a child has to understand the concept before they can acquire the form that expresses the concept; that is, after their mental ability reaches the appropriate developmental stage.

The main argument in cognitive theory is that language acquisition must be viewed within the context of a child's intellectual development and that linguistic structures will emerge only if there is an already established cognitive foundation (Sassonian, 2009).

In this paper, the cognitive theory is used to show the link between language acquisition and the biological maturation of the child; that the child doesn't acquire language at birth is because of the biological aspect; it is until it reaches the right maturation stage.

The social interactionist theory whose proponent is Vygotsky (1978) is also relevant in this paper. According to this theory, language exists for the purpose of communication and it can only be acquired in the context of interaction with adults and other older children. Focus in this theory is on the relevance of the linguistic environment and the culture in which language is acquired or learned in early years.

According to Vygotsky, social interaction plays a fundamental role in the development of cognition. Vygotsky (1978, p. 57) observes:

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; that is, first, between people (inter-psychological) and then inside the child (intra-psychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals.

In respect to this theory, the potential for cognitive development depends upon the "zone of proximal development" (ZPD): a level of development attained when children engage in social behavior. Full development of the ZPD depends on full social interaction.

According to Vygotsky (1978), the social environment provides the child with the means of making sense of their own linguistic behavior as well as making sense of the surrounding; thus, the human factor (with language) is key in the acquisition process.

The social interactionist theory is used in this paper to show how social context/linguistic environment provides support for the acquisition of language; without which language acquisition cannot take place. However, important to note is that as much as the social context is important, it does not provide the knowledge that is necessary for language acquisition and this is where Chomsky comes in with the child's innate ability; and Piaget with the aspect of mental development, that are key to the acquisition process.

The above theories are used in this paper to account for the biological basis of language; it is about being human, in a human environment. However, as much as these theories tell us much about the genesis, development and use of language; as much as there is enough evidence to support the theories, there are so many unanswered questions and this is how the fourth theory, the creationism theory comes in to complement; for where human knowledge comes to an end, that is where God's knowledge starts; for God is all knowing.

Creationism theory holds that the universe and life originated from specific acts of divine creation. With regard to language, it is believed to have originated from the miraculous acts of God; that is, language is endowed to man by God the creator. John 1:1-5 reads:

¹ In the beginning was the Word, and the Word was with God, and the Word was God. ² He was in the beginning with God. ³ All things were made through Him, and without Him nothing was made that was made. ⁴ In Him was life, and the life was the light of men. ⁵ And the light shines in the darkness, and the darkness did not comprehend it.

This theory is used in this paper to show that God is the one who initiated human language and without God, there was/is no language.

Despite the fact that many theories of language have been advanced by scholars, no single theory sufficiently explains the biological basis of language, development and use of language. Likewise, all the existing theories do not agree on the role of nature and nurture in matters that concern language (as much as all of them agree that it is language that distinguishes man from the other animals). This is where creationism theory comes in with God as the Creator of the universe and all that is in it, including language. Thus, creationism theory and science complement each other; questions that science is unable to answer, creationism theory comes in to fill in the gap.

METHOD

This is an exploratory research, where the intention was to explore the relationship between what science and creationism say with regard to language (with focus on the biological basis of language); and whether the two approaches contradict or complement each other.

Secondary data is used in the study, where existing linguistic data on the biological basis of language as well as data from biblical scriptures have been analyzed in order to answer the research question that guided this paper; that is, whether science and Creationism complement each other with regard to the question the biological basis of language, development and use. The findings of this paper form the basis for future engagement on the same for a better understanding of the interface between science and the creationism.

DISCUSSION

Interface between Science and Creationism with Regard to the Biological Basis of Language

The biological basis of language is hinged on the assumption that a human being who is physiologically and psychologically intact acquires any human language that they are exposed to; that is, humans have a genetic ability for language. Specifically, the biological basis approach to the language issue holds that for language to occur, the brain, the auditory system and articulatory system/ the manual-visual system must not only be intact but coordinate/ interact in a very specific but complex way, within a rich linguistic environment. The complexity in terms of the coordination of the organs concerned is too complex that science alone cannot sufficiently explain, without recourse to God as the author and designer of all things. Thus, the two, science and Creationism complement each other.

Based on the theories highlighted above, this discussion looks at how human beings are physiologically and psychologically preprogrammed for language and how this very act agrees with what the scriptures say.

Scientific Perspective

The Brain

The human brain is unique; it is pre-programmed for language acquisition, development and use. Regardless of where a child is born or even the type of language spoken by the parents, every child acquires the language that they are exposed to. Crain and Lillo-Martin (1999, p. 5) postulate that “language is not a concrete set of things out in the world that we can point out to or measure; rather, it is something inside our brains and minds”. Experiments (MRI-magnetic resonance imaging on the brain) done on people with damaged brain has shown that there is linguistic capacity in human brain. With regard to the same, Chomsky (2009) believes that human beings are born with a set of rules about language in their brains and they are equipped with an innate template or blueprint for language and this blueprint aid the child in the task of constructing a grammar for their language. The universal grammar according to Chomsky (2009) does not have the actual rules of each language but it has principles and parameters in which the rules of language are derived. In other words, the principles are the universal basic features of grammar such as nouns and verbs, while parameters are the variations across languages that determines one or more aspects of grammar e.g. pro drop and head direction. The parameters in children are set during language acquisition (Chomsky, 2009).

Despite the innate ability that humans have for language, they are not born with language; that is, they must reach a specific age for them to acquire specific features of language; their biological and mental maturation is key in the acquisition process. In other words, language is both physical and mental. This also explains why children start with babbling, production of one word, production of two words, before they begin producing fluent speech; these acquisition stages are in line with the child's general growth and maturation. This is acknowledged by cognitivists like Piaget (1936). The aspect of biological and mental maturation is key to language acquisition and use; this is seen in Jesus' life as recorded in Luke 2: 52, ⁵² *"And Jesus increased in wisdom and stature, and in favor with God and men"*. Though it is not vividly mentioned, Jesus' physical and mental growth also implies His linguistic growth; this is also illustrated in Luke 2: 47, where it reads, ⁴⁷ *"And those that heard Him were astonished at His understanding and answers"*. Naturally, physical and mental growth has linguistic implications in the same vein.

Neuroscientists have proofed that language functions are located in the left hemisphere of the brain, which is responsible for analytic functions, including language. Research by Bellugi (1967) has shown that language, whether by ear and mouth (speech) or by eye and hand (sign) is controlled by the left hemisphere of the brain. Further, Gazzaniga (1970) found out that all the areas that have been implicated in language are adjacent in one continuous territory; this region of the cortex is the left perisylvian region; that is, the language organ. Likewise, studies on patients with split brain as well as dichotic listening tests have shown that the left hemisphere of the brain controls the right side of the body and is in control of language in humans. On the other hand, the right hemisphere of the brain controls the left side of the human body and is concerned with creativity and art. As much as the lateralization of functions within the left hemisphere slightly differ from one person to the other depending on age, there is enough evidence to show that lateralization of language functions exists in human beings. One way to proof this is through aphasics' brain, who almost always have lesion on the left hemisphere of the brain. Likewise, whereas damage on the left hemisphere of the brain affects language functions in humans, damage on the right hemisphere does not. Unlike the adults who cannot effortlessly acquire language, children inherently acquire language faster and effortlessly. The reason why children do so is because of neuroplasticity; that is, their brain is elastic and not rigid; it is able to reorganize itself. Thus, functional plasticity is evident in infancy than it is in adults. Evidence for this is found in children who suffer brain damage; such children are able to recover language fully than it is for adults with the same lesion on the brain. For children, the right hemisphere takes over the language functions because of the plasticity of the brain; something that is missing in the adult brain. The Bible talks about the renewal of the mind (and there is a relationship between the brain and the mind) in Romans 12: 2; here it reads, *"And do not be conformed to this world, but be transformed by the renewing of the your mind, that you may prove what is that good and acceptable and perfect will of God."* One's mind is renewed when they come to Christ and they are able to do that which God wants them to do; this is only possible when they remain in Him. However, the moment they are outside Christ, then they will struggle to please Him. When one's mind conforms to Christ's pattern, they do not struggle to do what is right but they find themselves doing right. This is synonymous to a

child who is within the language acquisition age, whose brain is elastic; such a child acquires language without struggle. However, beyond that bracket (critical period), they struggle to acquire. What scientists have said about the human brain and language is in line with what the Bible says about the human mind and behavior; which includes linguistic behavior.

Besides lateralization of functions in the human brain, there is also localization of functions, where certain language functions are localized in specific areas within the left hemisphere. The Broca's area, which is in the frontal lobe of the left hemisphere, close to the motor strip is in charge of production; this is the area that controls the tongue, the jaw and the lips. On the other hand, the Wernicke's area, which is located near the auditory area is responsible for perception; that is, it is involved in verbal understanding; associating the sign and the signified. Localization of language functions is so specific to the human brain.

There is enough evidence to show that language functions in the left hemisphere are localized in specific locations. Whereas damage on the Broca's area affects production, damage on the Wernicke's area affects comprehension of language. Specifically, Broca's aphasics produce nouns, verbs and adjectives correctly but they are unable to string them together appropriately to form grammatical constructions; they have a problem with articulation. On the other hand, Wernicke's aphasics have fluent grammar but since they have a problem comprehending, whatever they produce is nonsensical. Thus, these patients have a problem with matching the sign and the signified, hence they are unable to communicate.

Just as with speech, human brain is predisposed for signing for the deaf and as such signing comes naturally. According to Poizner et. al (1978), both the Broca's and the Wernicke's are just as relevant to sign language among the deaf right from birth as they are to speech. As in speech, damage to Broca's area affects expression using hand gestures (production). Similarly, damage on the Wernicke's area for the deaf affects comprehension of the signs; hence, the aphasic makes nonsense signs.

It is evident that there is a relationship between language (both speech and signing) and the human brain; and it is also evident that the human brain is predisposed for language in a very special way. However, what is not evident is the process involved, which is so complex that it is not humanly possible to explain; this must be attributed to the miraculous acts of God. For "*who has known the mind of the Lord? Or who has been His counsellor?*" Romans 11:34. What science is unable to answer, God is able to; for unlike man who cannot 'see' what goes on in the mind, God does. This is seen in Psalms 139: 1-6:

¹ O Lord, You have searched me and known me. ² You know my sitting down and my rising up; You understand my thought afar off. You [\[a\]](#)comprehend my path and my lying down, And are acquainted with all my ways. ⁴ For there is not a word on my tongue, But behold, O Lord, You know it altogether. ⁵ You have hedged me behind and before, And laid Your hand upon me. ⁶ Such knowledge is too wonderful for me; It is high, I cannot attain it.

Unlike man, God understands everything, including the working of the mind.

The Critical Period

According to Lenneberg (1967), there is a critical period for plasticity; that is, a period for language acquisition; a period when language acquisition is effortless and fast because of the flexibility of the brain. This is also the period for functional maturation of the auditory system; normally before puberty. After the critical period (around 10 years), it becomes difficult for one to pick or learn language and attain native like fluency; thus after puberty, one has to make deliberate effort to acquire language as the ability to acquire effortlessly is slowed down. The reason why this happens is the reduced plasticity in the brain that makes it difficult for one to effortlessly acquire language. Evidence for this is seen in children (below puberty) with damaged brain, who are able to fully regain their language as compared to adults with the same problem. Similarly, wild/ isolated children recovered before puberty have been found to fully acquire speech but not those recovered after puberty. In the same vein, early exposure to language, (whether first or second) results into better achievement in language acquisition/ learning than late exposure.

Just as with speech, children born to deaf parents acquire sign language the moment they are exposed to one as long as they are within the language acquisition period/ the critical period. However, after this period, for them to acquire language, they must make deliberate effort. The same explanation applies; reduction in the plasticity of the brain makes it difficult for them to effortlessly acquire signs. Damage on the Wernicke's area for the deaf affects their comprehension of signs, while damage on the Broca's area affects their production of signs. Intervention for those with damaged brain works better when it is done during early years; that is, before puberty and not after; if done early, one is able to regain their signing ability.

The question of the critical period is not unique to science but rather it confirms what the bible says about language acquisition. In Daniel 1: 3- 4, it is reads:

³ Then the king instructed Ashpenaz, the master of his eunuchs, to bring some of the children of Israel and some of the king's descendants and some of the nobles, ⁴ young men in whom there was no blemish, but good-looking, gifted in all wisdom, possessing knowledge and quick to understand, who had ability to serve in the king's palace, and whom they might teach the language and literature of the Chaldeans.

These men were beyond the critical period of effortless language acquisition and as such, they had to make deliberate effort to learn the language of the Chaldeans. There is no contradiction in this whatsoever, science confirms what God has said about human language. The same is seen in Genesis 40: 6-8, where it reads:

⁶ "And Joseph came in to them in the morning and looked at them, and saw that they were sad. ⁷ So he asked Pharaoh's officers who were with him in the custody of his lord's house, saying, "Why do you look so sad today?" ⁸ And they said to him, "We each have had a dream, and there is no interpreter of it." So Joseph said to them, "Do not interpretations belong to God? Tell them to me, please."

Joseph is said to have communicated fluently in the Egyptian language, which he had learned. Having been sold to Egypt while he was seventeen years (Genesis 37:2), Joseph had to deliberately make an effort to learn the Egyptian language in order to communicate with the Egyptians. This is also confirmed in Psalms 81: 5, where it is recorded that when Joseph went to Egypt, he could not understand the Egyptian language; he had to learn ⁵*“This He established in Joseph as a testimony, When He went throughout the land of Egypt, Where I heard a language I did not understand”*. Joseph had to learn the Egyptian language to be able to communicate fluently.

The Auditory System

The human auditory system is wired for language. Every child who has intact brains, especially the Wernicke’s area and has a well-formed auditory system, has the innate ability to sense, process and comprehend the language that they are exposed to. The Wernicke’s area is involved in verbal understanding, associating the signs and the signified. Any impairment on the auditory system negatively affects the normal development of language in humans.

The auditory system is in charge of hearing. It is divided into two parts; the peripheral auditory system, which consists of the outer, middle and inner ear and the central auditory system; which starts from cochlear nucleus up to the primary auditory system. All normal children tend to comprehend language before they are able to produce; whether speech or signing. Right from birth, infants are sensitive to the acoustic cues that signify phonetic contrasts. Moreover, at the age of six months, a child is able to distinguish one phoneme from another regardless of where they are located; they are also able to filter sounds, hence differentiating those that are from his language and those that are not. Children are never taught how to make such contrasts but rather it is innate in them; they get to ‘know’ as they are exposed to the linguistic data around them.

That the auditory system is preprogrammed to comprehend language and that the ability to comprehend language is innate in humans is not in contradiction with what the bible says but it rather agrees with God’s word as recorded in Isaiah 50: 4; ⁴ *“The Lord God has given me the tongue of the learned, that I should know how I should speak. A word in season to him who is weary. He awakens me morning by morning; He awakens my ear to hear as the learned.* This verse confirms that it is God that makes it possible for humans to articulate and comprehend language; He has preprogrammed the auditory system to comprehend language. The intricate of what happens between the brain, the articulatory and the auditory system is too complex that both science and the Bible complement each other in giving the explanation. This is evident in Acts 2: 8, where it reads: ⁸*And how is it that we hear, each in our own language in which we were born?* The crowd marveled at the happenings; indeed, this must be attributed to the miraculous acts of God; it is beyond human explanation.

The Articulatory System

Just as the human brain and the auditory system is adapted for language, so is the articulatory system; that is, the human vocal tract has been wired in a very special way to enable human beings produce speech without any struggle; this is despite the fact that

these vocal organs evolved for other primary functions. Every infant whose vocal tract is intact is capable of vocalizing as long as they are exposed to speech. This attribute is so specific to humans as non-humans can only produce a small set of programmed sounds (on being taught) that are so contextualized as they lack the human innate capacity for speech.

Unlike the non-humans, the human teeth are upright and even in height. These features make it possible for humans to produce labiodentals; these are sounds that are produced using the lower lip and the upper teeth, sounds like the voiceless labiodental fricative /f/ and the voiced labiodental fricative /v/. In the same way, the teeth are so shaped in order to produce dental sounds like the voiceless dental fricative /θ/ and the voiced dental fricative /ð/; these sounds are produced using the tongue and the teeth. Human lips have intricate muscles that make them flexible, able to produce a variety of speech sounds including labiodentals mentioned above, bilabials that make use of the upper and the lower lip; that is, the voiceless bilabial plosive /p/ and the voiced bilabial plosive /b/. Unlike non-humans, the human mouth is small and it opens and closes rapidly making it possible for humans to produce speech. In the mouth is the tongue that is so versatile making it possible for humans to articulate quite a number of sounds; including laterals like /l/ and /r/. Unlike the non-humans whose larynx is raised, the human larynx is lower. Although this shape makes the humans to choke while swallowing, it is so wired for the production of laryngeal sounds; these are sounds produced in the larynx; they include vowels in English as well as sounds like /h/. The vocal cords are also wired in a very specific way in order to produce either voiced or voiceless sounds. When vocal cords come together, air from the lungs pushes them apart and as it passes through, vibration occurs hence voiced sounds are produced; these includes voiced plosives like /b/, /d/, /g/. On the other hand, when the vocal organs are spread, no vibration occurs and as such the voiceless sounds are produced; these include voiceless plosives /p/, /t/, /k/.

The way the human articulatory system works shows how adapted the vocal organs are for language, an attribute that is lacking in other animals. Every normal human being with intact brains and articulatory system is able to produce speech as long as they are in a rich linguistic environment. The working of the articulatory system confirms God's perfection in creation. After God created man (and by extension everything else), He looked at man and everything else and said that it was good; Genesis 1: 31, ³¹*Then God saw everything that He had made, and indeed it was very good, so the evening and the morning were the sixth day*". When God said that everything He had created was good, He meant that there was no imperfection; there was no short coming; He had designed everything appropriately in line with His design; He had put everything together to work as expected. This is further exemplified through Psalms 139: 13-17:

¹³ For You formed my inward parts; You [covered me in my mother's womb. ¹⁴ I will praise You, for I am fearfully and wonderfully made; Marvelous are Your works, And that my soul knows very well. ¹⁵ My frame was not hidden from You, When I was made in secret, And skillfully wrought in the lowest parts of the earth. ¹⁶ Your eyes saw my substance, being yet unformed. And in Your book they all were written, The days fashioned for me, When as yet there were none of

them. ¹⁷ How precious also are Your thoughts to me, O God! How great is the sum of them!

God designed man in a very specific way, with every organ specifically fashioned with ability to function in a very specific way. Consequently, the biological adaptation of the articulatory system agrees with God's design of man; there is no contradiction.

That the articulatory system of man is specifically wired for speech and that infants with intact vocal organs automatically produce speech when exposed to a rich linguistic environment; that they don't have to be taught as long as their brain is intact, is a clear indication of God's divine acts in man as indicated in Isaiah 50: 4; ⁴ *"The Lord God has given me the tongue of the learned, that I should know how I should speak. A word in season to him who is weary. He awakens me morning by morning; He awakens my ear to hear as the learned"*. It is God that has put every organ in place and He has deposited in man all that they need in order to produce speech and this is why to scientists, this ability is innate; this shows the interface between science and Creationism.

Just as the articulatory system in man is adapted for speech, the manual visual system is also adapted for signing among the deaf. However, for the deaf to sign, their brain must be intact and they must be exposed to a rich linguistic environment in order to trigger signing. A child that has been isolated from the linguistic context can never acquire signs.

Linguistic Environment

Important to acknowledge is the fact that as much as the brain, the articulatory system, the auditory system and the manual-visual system in humans is predisposed for language, no language can occur and develop unless there is a rich linguistic environment. Thus, it is not possible for one to speak, comprehend, sign or understand signs until and unless humans are exposed to linguistic data that is only available in a social context. Social interactionists have pointed out this as key to acquisition, and since this involves human beings, whose biological predisposition makes it possible to provide the required social context, it is still about the biological basis of language. The Bible acknowledges the relevance of the linguistic environment in the acquisition and use of language. For instance, Adam was created as a talking and an understanding being; he was created with language. However, Adam was only able to use language because he was in a rich linguistic environment, where God the father, God the son and God the Holy Spirit provided a social context for him to use language and from then hence forth, they continued communicating. Genesis 1: 26- 31,

²⁶ Then God said, "Let Us make man in Our image, according to Our likeness; let them have dominion over the fish of the sea, over the birds of the air, and over the cattle, over all the earth and over every creeping thing that creeps on the earth." ²⁷ So God created man in His own image; in the image of God He created him; male and female He created them. ²⁸ Then God blessed them, and God said to them, "Be fruitful and multiply; fill the earth and subdue it; have dominion over the fish of the sea, over the birds of the air, and over every living thing that moves on the earth."²⁹ And God said, "See, I have given you every herb that yields seed which is on the face of all the earth, and every tree whose fruit yields

seed; to you it shall be for food.³⁰ Also, to every beast of the earth, to every bird of the air, and to everything that creeps on the earth, in which there is life, I have given every green herb for food”; and it was so.³¹ Then God saw everything that He had made, and indeed it was very good. So the evening and the morning were the sixth day.

God spoke to Adam because Adam was able to understand language, otherwise, He couldn't have done so.

Creationism Perspective

According to creationism theory, before man came into existence, language already existed with God; that is, God Himself had language and He used language to converse with God the son and God the Holy Spirit as recorded in Genesis 1. Likewise, God used language to create the universe and all that is in it, including language; for He said “Let there be” and whatever He said/ mentioned, came into existence. Further, in creating man, God did not do it alone but He, together with God the son and God the Holy Spirit did worked together; Genesis 1: 26, ²⁶*Then God said, “Let Us make man in Our image, according to Our likeness; let them have dominion over the fish of the sea, over the birds of the air, and over the cattle, over all the earth and over every creeping thing that creeps on the earth.”* This is evidence that language existed before the existence of man and its existence is attributed to God.

Creationism theory shows that man was created with language; that is, God created man with the ability to use language. In Genesis 1: 28- 30, we see God converse with man,

²⁸Then God blessed them, and God said to them, “Be fruitful and multiply; fill the earth and subdue it; have dominion over the fish of the sea, over the birds of the air, and over every living thing that moves on the earth.” ²⁹And God said, “See, I have given you every herb that yields seed which is on the face of all the earth, and every tree whose fruit yields seed; to you it shall be for food.³⁰ Also, to every beast of the earth, to every bird of the air, and to everything that creeps on the earth, in which there is life, I have given every green herb for food”; and it was so.

The conversation between God and man took place because man could comprehend; he had language.

Further, in the garden of Eden, Adam is seen naming all the animals that God had created; no where do we see Adam being taught language by God or anybody else for that matter; meaning that Adam was created with the ability to use language, Genesis 2: 20 ²⁰*So Adam gave names to all cattle, to the birds of the air, and to every beast of the field. But for Adam there was not found a helper comparable to him.* If Adam never had language, he couldn't have named the animals; he did because he had language and all he needed was a social context, a linguistic environment to trigger the language in him. With regard to this, God the father, God the son and God the Holy Spirit provided the suitable linguistic environment.

With Adam possessing language, when Eve came on the scene, communication using language became part and parcel of their lives. Like Adam, Eve was never taught language

by anybody, she too was preprogrammed for language and all she needed was the presence of another human being, which was found in the name of Adam. Thus, there is enough biblical evidence to show that language originated with God; that it is Him that gives language to man and that the innate ability in man that linguists discovered is a confirmation of what God in His wisdom gave to man right from the beginning.

Further in Genesis 11: 5-9, it is shown that it is God that gives language and that He has the ability to change it and even take it away,

⁵ But the Lord came down to see the city and the tower the people were building. ⁶ The Lord said, "If as one people speaking the same language they have begun to do this, then nothing they plan to do will be impossible for them. ⁷ Come, let us go down and confuse their language so they will not understand each other." ⁸ So the Lord scattered them from there over all the earth, and they stopped building the city. ⁹ That is why it was called Babel—because there the Lord confused the language of the whole world. From there the Lord scattered them over the face of the whole earth.

Besides the above verses explaining the genesis of diversity in language, they also show that God has the ability not only to give but also change and/ or take away language from man. The New Testament too gives evidence that it is God that gives man language; Acts 2: 4, ⁴ *All of them were filled with the Holy Spirit and began to speak in other tongues as the Spirit enabled them*". Likewise, the story of Zachariah in Luke 1: 18-22, shows us how God has the ability to take away language;

¹⁸ And Zacharias said to the angel, "How shall I know this? For I am an old man, and my wife is well advanced in years." ¹⁹ And the angel answered and said to him, "I am Gabriel, who stands in the presence of God, and was sent to speak to you and bring you these glad tidings. ²⁰ But behold, you will be mute and not able to speak until the day these things take place, because you did not believe my words which will be fulfilled in their own time." ²¹ And the people waited for Zacharias, and marveled that he lingered so long in the temple. ²² But when he came out, he could not speak to them; and they perceived that he had seen a vision in the temple, for he beckoned to them and remained speechless.

Later, after the child was born, circumcised and named on the eighth day, God gave language back to Zachariah as recorded in Luke 1: 59- 64:

⁵⁹ So it was, on the eighth day, that they came to circumcise the child; and they would have called him by the name of his father, Zacharias. ⁶⁰ His mother answered and said, "No; he shall be called John." ⁶¹ But they said to her, "There is no one among your relatives who is called by this name." ⁶² So they made signs to his father—what he would have him called. ⁶³ And he asked for a writing tablet, and wrote, saying, "His name is John." So they all marveled. ⁶⁴ Immediately his mouth was opened and his tongue loosed, and he spoke, praising God.

This is evidence that language is from God.

The social context as proposed by Vygotsky (1978), confirms the biblical perspective on language acquisition and use; that the linguistic data that is provided by human beings in a social context is very important in the acquisition, development and use of language. Even with intact physiological and psychological organs that are predisposed for language, acquisition and use of language cannot occur without a rich linguistic environment, which is provided by human beings.

CONCLUSION

There is enough scientific evidence to support the biological basis of language in human beings. Existing evidence show that language is an aspect of human biology; that human beings are wired for language; they are born with the innate ability to acquire any language that they are exposed to. From the discussion, what science says about the biological basis of language, development and use, confirms the creationism view on language; and for both, this is made possible in a rich linguistic environment; an environment is provided by human beings. However, what science does not say is the intricate of what really happens for human beings to be able to acquire and use language the way they do. This gap is filled by the creationism view in which God is the creator of all and He is the designer in every design, including language. The paper has shown that although science has come up with theories on the question of human language, these theories cannot sufficiently handle the language question. This insufficiency points to the inadequacy of human beings that only God can perfect. With regard to language, whatever questions that science is unable to answer, the answer is with God; hence, science and creationism complement each other in giving answers to the question of language.

The paper has shown that the evidence provided by science with regard to the biological basis of language does not in any way contradict the creationism view about human language but instead it confirms the fact that indeed God designed human beings to acquire and use language in the very manner that they do today. The paper has also shown that God's ability is beyond man; He is able to do far much more than what is humanly possible. This is observed in the way that God causes animals to speak, something that is not possible in the natural.

There are numerous theories which explicitly depict truths around language. They not only narrate the mesmerizing stories but also point out the human urge to unravel the secret of language. The intricacy and complexity involved in the design of human language bring in the element of divinity in their evolution, development and use. No doubt, the human quest of finding the ultimate answer to the nature of human language will continue.

The findings in this paper paves way for further research on the interface between science and Creationism, especially with focus on the linguistic aspect; an aspect that is too complex and unique to humans that it is impossible for them to explain the intricacies that are involved without recourse to God, the Creator.

Further Research

There is need for research on the biological basis of language with focus on the interface between science, creationism and African mythology.

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