

UNDERSTANDING ACOUSTICS: SOUND IN HUMAN AND ANIMAL COMMUNICATION

Cecilia Amaoge Eme

Department of Linguistics, Nnamdi Azikiwe University, Awka, Nigeria

ca.eme@unizik.edu.ng

Abstract

Sounds are crucial in the communication forms of humans and animals. Acoustics is, therefore, very important for the understanding of the functions of sounds in their communication processes. Basically, humans communicate with language while animals use different forms of sounds. This paper examines how humans and animals produce and utilise sound to transmit information to the members of their species, and how human language resembles and differs from animal communication. The purpose is geared towards gaining a better insight into the acoustic world of humans and animals. The study shows that speech production is possible due to the acoustic variability in the sounds produced by the human vocal tract as a result of its anatomical shape and size. As humans use language through speech production and comprehension, they fall back on the intricate relationship between their vocal organs (comprising the vocal cords, lungs, and vocal tract), hearing organ (the ear), and decoding organ (the brain). Thus, various sounds like consonants and vowels are produced, and their combination is perceived and comprehended as meaningful. Therefore, the speech organs produce speech sounds, the ear perceives the sounds in the form of sound waves, and the brain decodes them into meaningful utterances. For animals, their physical properties like body size and shape of head and mouth, as well as the nature of the environment, influence the sounds they produce. Although animals can communicate a wide range of activities and emotions, human language is said to be unique not only for its complexity but also for the mental abilities required for its engagement. However, further research on animal communication is required to confirm this claim because recent studies on songbirds assign such uniqueness found in human language to their communication forms.

Keywords: *Acoustics, Sound, Language, Animal communication, Speech production*

Introduction

The study of sound employed for communication purposes by humans and animals is captured under acoustics, which, simply put, is the scientific study of sound. Acoustics involves studying the various properties of sound, its behaviour and the numerous effects it can have on humans, animals, infrastructure, and, in fact, the entire environment. Humans and many animal species can hardly do without the use of sounds in passing on information to their species. This is to say that sounds are crucial in the communication forms of humans and animals. The study of acoustics is, therefore, very important for the understanding of the functions of the different kinds of sounds which humans and animals use in their communication processes. Physical properties like body size and shape of head and mouth, and environmental factors and weather such as wind, snow, dust haze, rains, cloudiness and forest expanse, as well as density, affect sound transmission and, invariably, communication; because the sounds used for communication travel in a medium in the form of sound waves.

Basically, humans communicate with language, which Anagbogu, Mbah and Eme (2010:1) define as “a means which human beings have devised for communicating ideas, feelings, emotions, desires, etc. through complex vocal or written symbols.” Many animals also use different forms of sounds for communication among their members. For instance, they could

have varied sounds for defending their territories, issuing warnings to enemies to steer clear, calling their family members for safety, expressing pain, joy or hunger, attracting mates and engaging in forms of social bonding. In fact, in the communication processes of animals, acoustic signals can be so specifically structured in a way that each pattern of signal conveys specific information or a message. The interest in this paper is in the use of sounds for communication by humans and animals.

Humans, in the process of their use of language, engage in the production of sounds referred to as speech sounds. The production of these speech sounds is possible through the use of the vocal tract, which can easily be manipulated to produce speech sounds of different acoustic qualities, resulting from its anatomical shape and size. As humans use language for communication through speech production and comprehension, they fall back on the intricate relationship between their vocal organs or organs of speech (comprising the vocal cords, lungs, and vocal tract), the hearing organ (the ear), and the decoding organ (the brain). Using the organs of speech, various sounds, which can be broadly categorised into consonants and vowels, are produced. As important as the vocal tract is for speech production, Demolin (2024:15) has noted that it offers “only a small inventory of reliable and biomechanically robust actions that are exploited over many repetitions for linguistic expression.”

It is the appropriate combination of the speech sounds that is perceived and comprehended as a meaningful expression. Therefore, the speech organs produce speech sounds, the ear perceives the sounds as they travel into it in the form of sound waves, and then the brain decodes the properly organised sounds as meaningful utterances. Without the brain, communication using speech would be impossible. Understanding the intricacies of speech requires a deeper study of the brain. According to Demolin (2024:74), “We have to understand the brain's electrochemical and neurological processes that are associated with language and speech. There lies the key to future fundamental explanations. This will likely necessitate the use of deep learning and AI techniques.” For this, studies are ongoing.

This study is on understanding the interesting world of acoustics, with a focus on sounds in human and animal communication. It enquires into the nature of language and how human beings and different animals produce and utilise sounds for communicating information to the members of their species. It also studies how animals were trained to learn language to ascertain whether language is the exclusive reserve of humans, as well as discussing how human language resembles and differs from animal communication. This study is geared towards gaining a better insight into the acoustic world of humans and animals.

Sound and Language

The organs of speech are utilised for the production of a wide range of sounds made up of consonants and vowels. This is because of their unique anatomical shape, size, and the nature of their ability to be manipulated. Although the organs of speech are not primarily for speech production, humans have adapted them for speech. Their cooperation in the adaptation makes them work harmoniously to produce varied speech sounds. The production of any speech sound involves the appropriate configuration of the speech mechanism, otherwise known as the organs of speech, and the right use of the available energy, called the airstream mechanism. Airstream here refers to the body of air that can be manipulated for speech production. The airstream emanating from the lungs, referred to as the pulmonic egressive airstream, is the basic energy source for speech production, as most of the speech sounds of the world's languages are produced with this airstream. Let us examine the processes involved in the production of some members of the two classes of speech sounds - vowels and consonants.

Production of Vowels

A vowel sound is produced without any obstruction in the vocal tract. It is described in terms of the height of the tongue towards the palate, the part of the tongue that is raised, and whether the lips are rounded or unrounded. The vocal cords vibrate in the larynx during the production of the vowel; hence, vowels are characteristically voiced and, therefore, not described in terms of whether voiced or voiceless. For want of space, let us describe the production of only the vowel sounds /i/ and /u/ in the English words, sea /si/ and you /ju/ respectively; and in Igbo high tone words *isi* /isi/ 'head' and *ute* /ute/ 'mat' respectively. During the production of /i/, the front part of the tongue is raised very close to the palate, the airstream from the lungs supplies the energy, while the lips are unrounded. The sound is, hence, described as a close front unrounded vowel. For /u/, it is the back of the tongue that is raised close to the palate; meanwhile, the lips are rounded. The sound is, therefore, described as a close back rounded vowel.

Production of Consonants

A consonant is a sound produced with total or partial obstruction of the airstream somewhere within the vocal tract. The place of the obstruction is used to name the sound. For example, bilabial nasal [m], which is the initial sound in the English word 'man' and the Igbo high tone monosyllabic word 'me' (do), has the obstruction at the lips. In the production of this sound, the lips, soft palate, nasal cavity, and vocal cords are the organs of speech that play prominent roles. The energy required for its production emanates from the lungs. The lips are brought tightly together, and the soft palate is lowered, thereby allowing the airstream from the lungs to escape through the nasal cavity. The vocal cords are brought close together so that when the airstream from the lungs escapes, they vibrate. This vibration of the vocal cords is what is called voicing or phonation. Speech sounds produced with phonation are called voiced sounds, while their counterparts produced without such vibration are called voiceless sounds.

Consonants are described using a three-term label of description- whether voiced or voiceless, the organs of speech involved, and the state of the vocal cords during the production of the sound. Based on the three-term label, the sound [m] is voiced, it is bilabial, and it is nasal; but because, basically, all nasals are voiced, the sound is described as bilabial nasal. It is a bilabial sound because it is the two lips that come together during its production, and a nasal sound. After all, during its production, all the airstream escapes through the nasal cavity.

There are some consonant sounds during whose production the airstream goes out through the oral cavity. Those are the oral sounds. For example, /s/ as in the English word seed /sid/, and the Igbo high tone word *su* /su/ 'pound'. To produce the sound, the tip of the tongue is raised very close to the alveolar ridge, leaving just a little space in between them such that the pulmonic egressive airstream passes out with friction; meanwhile, the vocal cords are not vibrating. The sound is described as a voiceless alveolar fricative. Its voiced counterpart is /z/ as in the English words zebra, zoo, zero, xenophobia, xylophone; and Igbo high tone words *zi* 'show', *za* 'answer', *ze* 'collapse', *zo* 'hide', *zu* 'steal'.

Nature of language

There are certain characteristics with which language is identified. Some of these characteristics constituting the nature of language are:

Language is basically spoken. Every language has its spoken form, but not all languages have been reduced to writing. In fact, 90% of the world's languages are unwritten languages

(Demolin, 2024). Spoken language involves the use of speech sounds, which are combined in distinctive ways for the conveyance of meaning.

Humans have described language as being species-specific to only the human species. They claim that many factors (like the structure of the vocal organs, the brain, and teeth) provide evidence that language is innate to humans because no other animals possess the kind of structural adaptation for speech like humans. In the words of Nwankwo (2024:30), “Language is a unique attribute of man that facilitates inter-personal communication. It is, in fact, the pivot around which all human activities rotate. It is a unique attribute of man’s distinctiveness and that priceless mandate of superiority over other creatures.” However, some researchers have contended that human beings cannot rightly claim to be the sole owners of language when they have not exposed other animals to language or studied the complexity of the communication systems of various animals. These issues will be discussed shortly.

Meaningfulness is part of the nature of language. However, this characteristic is not unique to language, as the different communication methods of animals are meaningful. Language is a living thing. This means that it can grow and it can, as well, die. Hassan (2015:74) laments that in Nigeria, minority languages are threatened by the major languages. It should be noted that in most cases, a language goes through some processes of endangerment before it finally dies. According to Wurm (2003), there are five levels of endangerment comprising potentially endangered, endangered, seriously endangered, terminally endangered and dead or extinct. A language is potentially endangered when children have a dominant language they are more interested in, making them less likely to learn their language perfectly well. For the level when a language is termed endangered, there are few children who speak the language. A seriously endangered language has speakers who are middle-aged or past middle-aged as its youngest speakers. When a language has only a few elderly speakers, it is said to be terminally endangered. A language dies when it no longer has any speakers. Okolo (2015:48) has it that Nigeria records “10 extinct languages that can be accounted for.” This emphasises the need for speakers of a language to preserve their language and save it from death.

Language is dynamic. As it moves, it may gather some new words, drop some, extend the meaning of some, contract the meaning of others, etc. Language is arbitrary. Every language has, for example, the names it calls objects. These are arbitrary, as the name does not ‘resemble’ the object bearing it. Language is also conventional. What a language calls an object is merely conventional, arising from the consensus of the language speakers. This is to say that language speakers call something by what they agree it should be called.

Language is creative, as a speaker of a language can produce many varieties of sentences, which are acceptable in the language. Many of the sentences are the creation of the speaker because he has not heard them before. In addition, language is learnt. A child has to be exposed to his/her language before s/he can acquire it. This means that it is not like such behaviours as yawning and sneezing that do not require learning. Some animals may not need to learn their communication method because they are born with it; language must be learnt.

Sound and Animal Communication

Animals can use different sounds to express many activities and emotions. Nwankwo (2024:31) adds that, “Animals communicate in various ways such as using gestures, facial expressions, colour change, auditory channel, and electro-communication.” The sounds animals use for communication, referred to as vocalisations, are usually produced in specific contexts and for specific functions. For instance, insects, birds, amphibians, and mammals

use distinct calls and specific sounds or songs for communication. For want of space, let us use one particular species of each of the above sets for our illustration; after which we discuss the linguistic chimps.

Insects: The Cricket

Crickets are nocturnal insects. There are different species of the insect. For most of the species, they communicate through various ways, including the use of sounds, scent, and touch (<https://biokids.umich.edu>Gryllidae>). On sounds, the males use chirping sounds to attract mates. Other sounds they make could be by vibrating their body parts, especially their wings, whistling using certain specialised organs of their body, or rubbing some of their body parts together to produce specific sounds. All these communication methods of crickets using various sounds serve their communication needs such as territorial defence, signalling happiness, hunger, danger or fear, sending out mating calls to females, and calling their members to come and eat.

Birds: The Songbird

According to the information on <https://academy.allaboutbirds.org>, the songbird is a species of bird found in all the continents of the world, except Antarctica. The term comprises half of the world's 10,000 bird species. Among the songbirds are such birds as Brown Thrasher, warblers, Northern Cardinals, thrushes, and sparrows. The songbird uses complex songs for communication. For example, it sings to impress, to defend territory, to announce its presence to a potential mate, and to express the presence of a threat in its vicinity. Brown Thrasher (*Toxostoma rufum*) has over 1,000 song types. Unlike most other bird species that sing as a matter of inherited behaviour, a songbird learns its songs and performs them using a specialised voice box called a syrinx. It is interesting to understand that,

The songbird syrinx makes vocal gymnastics possible -for example, the Northern Cardinal (*Cardinalis cardinalis*) can sweep through more notes than are on a piano keyboard in just a tenth of a second. Because each branch of the songbird syrinx is individually controlled, the cardinal can start its sweeping notes with one side of the syrinx and seamlessly switch to the other side without stopping for a breath, making it the envy of human vocalists everywhere. Some sing two notes at once (<https://academy.allaboutbirds.org>)

All these show how productive the vocal apparatus of the songbird could be concerning communicating with the members of its specific species. However, apart from the songs used for specific purposes like expression of happiness, hunger, territorial defence, and attraction of a mate, most of the other songs could be classified as songs to impress.

Amphibians: The Frog/Toad

The frogs and toads use different sounds to communicate with the members of their species. Apart from sounds, they also communicate using tactile and visual signals (<https://www.livescience.com>). After the rains, they are heard croaking in swamps and pits where floodwater collects. The croaks are often used to call their mates. They have sounds to signal hunger, danger, territorial defence and their other needs. Their typical croaks are very loud. They employ the facilities in their throat, lungs and buccal cavity. In celebrating Chinua Achebe, the man Nelson Mandela describes as “A writer in whose company the prison walls fell down”, it is said,

A choir of squatting toads

Turns the stomach of day with
Goitrous adoration of an infested swamp
(*Celebrating the life of Chinua Achebe*, 2013:1)

The above excerpt captures the scenario in the environment of the toads. Not only one croaks at a time, but numbers; thereby forming ‘a choir’ so to speak. It not only describes the sounds but also the physical state of the throat of the toads as ‘goitrous’ because the throat gets so enlarged during croaking, as if it has a goitre. Using all these sounds and other methods, the frogs and toads can satisfy their needs for interaction and communication among their various members.

Mammals: The Monkey

A monkey can deploy many methods, including sounds, facial expressions, gestures, body movements, aggression, posture, and visual display, to communicate with its tribe members or other monkeys. However, the focus of this paper is the use of sounds. Monkeys use complex and varied vocalisations for communication. They produce the sounds for the appropriate context and at the right moment by the use of their vocal tract, vocal cords, and lungs. The lungs supply the air needed for vocalisation. Examples of vocalisation by monkeys are screams, alarms and hoots (www.wildlifefaq.org). A monkey screams when it feels unsafe and afraid. The scream is called a fear scream. The monkey’s fear scream is a powerful, loud yell such that the sound can be heard from a long distance. This kind of scream can frighten the intruder, giving the monkey room to escape to safety. The loud sound also helps send a message across to other monkeys that there is danger; they could help rescue their embattled member.

Another kind of major sound produced by the monkeys is the alarm. An alarm call is usually loud. It has this characteristic high pitch that draws attention to itself, and alerts other monkeys to the presence of a threat like lion, tiger, leopard, bear, cheetah, and snake, thus giving the monkeys room for escape. The monkey that would produce the alarm call normally stations itself in a safe place before sounding the alarm call. Research has shown that different kinds of monkeys have different sounds for similar issues, and different sounds are used in alarm calls to indicate the particular danger lurking around them. For instance, Harley (2000:8) claims that a “vervet monkey produces a snake chitter to warn others that a snake is nearby, and a distinct eagle call when an eagle is overhead.” Concerning hoots, monkeys hoot when they are calling their fellows to come and eat, or when they are engaging in social interactions. The hoots, referred to as pant-hoots, help the monkeys to care for themselves, and they come in handy in bonding and intimate social relationships.

Linguistic Chimps and Species-specificity of Language

In studying the many interesting things about human language, one is tempted to wonder why other animal species have not evolved language. Are animals not capable of learning language? In other words, is language species-specific to human beings? Researchers have made many attempts to teach other animals how to use language. This is to confirm whether human beings are the only species that can use language. Such attempts used mostly the primates. Primates are said to be the closest animal to man in the evolutionary ladder. Animals that are primates include apes, monkeys, chimpanzees, and gorillas. Most of the experiments used primates, especially chimpanzees (chimps), because they are believed to be intelligent and teachable. Female chimps are preferred; they are friendlier than the males and can, therefore, be trained for a longer period than their male counterparts.

The intelligence of primates is attested by many researchers. As Harley (1995:11) puts it, “The cognitive abilities of apes, while obviously inferior to those of humans, are not very different from those of very young children.” Even though some people say that not only humans possess language since parrots can ‘speak’, this has been quashed because parrots can only imitate and repeat what they have heard a human being say. They cannot say these on their own. They do not attach any meaning to what they say. This means that two important characteristics of language, that is, having meanings and being creative, are lacking in the ‘speech’ of parrots. There are, therefore, attempts to teach language to primates. This is to ascertain whether they can use language if exposed to a rich linguistic environment. Some of the experiments are those involving the following chimps:

Gua: The first recorded attempt at training chimps to speak is that of Kellogg and Kellogg (1933). They named the female chimp Gua. They used a method of training called cross-fostering, involving raising the chimp alongside a human baby, their son. They reported Gua’s progress after some years of training. According to their report, Gua failed to speak any word that could be recognised, and her understanding of words was poor. This experiment was followed by others. The most reported being two separate experiments with Washoe and Sarah.

Washoe: Washoe is the name given to a female chimpanzee by a couple, Allen and Beatrix Gardner. This experiment was conducted between 1967 and 1972. After the experiment, she was taken to Central Washington University, where she lived from 1980 to 2007, when she died (Leder, 2023). Washoe was brought into the Gardner’s family at the age of 11 months. She was treated like a baby member of the family and exposed to the rich linguistic environment of the American Sign Language (ASL or AMESLAN). Like spoken language, ASL has its own words and syntax, and is the standard sign language for the deaf in use in North America. Washoe made progress in her training. For example, she acquired 132 signs at age 4 years. At age 5 years, she increased the number to about 200 signs, which comprised nouns, verbs, adjectives, and pronouns. Washoe was able to generalise or restrict the use of some of the signs she learnt. She was able to use WH-questions better than a 5-year-old child. She was also reported to be able to use new combinations. This means that Washoe was creative in her use of signs. For example, she used the signs for ‘water’ and ‘bird’ to mean ‘water bird’ when she saw a duck for the first time. Washoe understood more signs than she could produce, although her signs contained many redundancies. She was able to teach her adopted son, Loulis, and a female chimp, Tatu, the signs she learnt. In the words of Leder (2023), “She became known around the world as the first chimpanzee to learn a human language and pass it on to another primate.” This is a great achievement.

Sarah: A couple named David and Ann Premack reported their experiment in 1971. They used a female chimp named Sarah for their experiment. At the time Sarah started her training, she was 6 months old. They taught her an artificial language called Premackese. It involved the use of plastic cuttings or chips. The plastic chips, which represent symbols and the rules for their combination together form Premackese. They put Sarah in a place where nobody outside of themselves could communicate with her. They brought many plastic chips of different sizes, shapes and colours, each representing an English word. They could tell Sarah to arrange the following sentence with the plastic chips:

The rat ate the fish.

Sarah would go to the basket containing the chips and, from there, pick the right chips to arrange her sentence:

rat ate fish

This way, they were able to confirm the intelligence of Sarah because even though she could not talk, she showed that she was able to understand what was required of her. She made some remarkable achievements. She was able to prove her understanding of the fact that the chips she was using to represent objects were not actually the objects. She was able to realise the importance of word order in English for the conveyance of the required information. She could, therefore, properly arrange and distinguish these sentences:

Richard give meat Sarah

Sarah give meat Richard.

Sarah also answered questions on the colours, shapes and sizes of objects. She constructed new sentences by using lexical substitution, e.g. substituting 'Sarah' with 'Richard', and 'meat' with 'banana'.

Lana: Duane Rumbaugh and others conducted and reported their experiment in 1978. Lana (a female chimp) and other chimps named Sherman and Austin were taught an artificial language called Yerkish. The symbols that serve as words in Yerkish are referred to as lexigrams. Yerkish consisted of a set of symbols on a large keyboard linked to a computer. When Lana and others want to have something, they have to press the appropriate buttons in the correct order to produce the required message. For instance, if Lana wants water, she has to press four symbols in the correct sequence, thus: Please - machine - give - water.

From all these experiments with primates, one can rightly conclude that even though some of them, especially Washoe using her ASL, Sarah with her Premackese, and Lana with her Yerkish, achieved relatively much, these achievements do not really explain whether animals can learn human language. Yerkish is, of course, an artificial language, and the little success that Lana recorded is not enough to ascribe the possession of language to other animals. According to <https://time.com/archive/6875366/-the-education-of-sarah>

Science has long sought to discover in the intelligent chimp the gift of language, the incomparable skill that distinguishes mankind from all other living things. Until now, that search has been fruitless; the chimp lacks the capacity for speech that is innate in every normal human infant.

After explaining the achievements of Sarah, her trainer, Premack, has this to say, "This does not mean that she can produce all the functions of language, or that she can do everything a human can" (<https://time.com/archive/6875366/-the-education-of-sarah>). Therefore, an investigation as to whether language is a possession of only the human species is still going on.

Comparison of Language and Animal Communication

From the foregoing discussion, it is seen that both human beings and animals have their different communication systems involving sounds through which they interact with the members of their kind. Language differs significantly from animal communication in many ways, especially in terms of complexity and cognitive requirements. Whereas language is matchless in complexity, each animal communication sound is basically for a specific situation and function. According to Anagbogu, Mbah and Eme (2010:2), "Even though other animals may be able to communicate with other members of their species, their communication does not go beyond a sort of response to certain stimuli to signal hunger,

sexual excitement, fear, happiness and other feelings.” The complexity of language makes it possible for humans to communicate anything, including things in the past, present and future, as well as being creative in language use. While animals can use sounds to communicate effectively to cover their needs within their environment, language goes far beyond being merely functional. The ability of humans to use language to express abstraction, imaginary concepts, share all manner of stories, and express emotions, no matter how complex or peculiar they might be, makes language a complex behaviour.

Although animals can employ sounds to communicate many of their normal activities and emotions, language is unique in itself, not only for its complexity but also for the mental abilities required for its engagement. Such mental abilities required for language use include cognitive processing and symbolic thinking; these are not required in animal communication sounds, which are basically based on instinct, and innate and learned behaviours. Language is, therefore, seen as a unique endowment of the human species. However, it is important to note that some animals’ use of sounds for communication is said to involve the kind of mental abilities required for language. For instance,

Songbirds and humans have a lot in common on the learning front. Baby birds babble just as humans do. Like birds, humans need to hear themselves and others to produce normal adult sounds. And just as it is much harder for us to learn languages after childhood, most birds experience a critical period as nestlings when they are best able to learn song. There is even recent evidence that some songbirds can learn syntax in a similar way to how we learn to string together sentences. Songbirds stutter, babble when young, become mute if parts of their brains are damaged, learn how to sing from their elders and can even be ‘bilingual’. In other words, songbirds' vocalisations share a lot of traits with human speech (www.scientificamerican.com)

This research finding on the mental abilities of the communication system of the songbird makes some researchers, especially psychologists, question the uniqueness claim by humans with regard to their communication system (Harley, 2000). Although many species of birds, frogs and toads and some other animals are born with innate vocalisations such that they produce the sounds of their species without learning them, many other animals like ducks, songbirds, chimpanzees, whales, and dolphins learn the vocalisations of their species.

Unlike humans, who use their organs of speech, like the vocal tract, larynx housing the vocal cords, and the lungs for speech, birds produce sounds using an organ called the syrinx. The organ is situated at the point where the trachea splits into two bronchial tubes. Humans are, therefore, constrained from producing certain sounds because of the nature and positioning of their speech apparatus, a constraint that does not apply to songbirds. It is reported (see <https://academy.allaboutbirds.org/birdsong>) that songbirds have the capacity to produce sounds impossible for humans:

In songbirds, each side of the syrinx is independently controlled, allowing birds to produce two unrelated pitches at once. Some birds even have the ability to sing rising and falling notes simultaneously, like the Wood Thrush (*Hylocichla mustelina*) in its final trill. We can only imagine what musical heights human vocalists could reach with abilities like that.

Language is a purely human attribute possessed by only the human species, as claimed by humans themselves. The sounds produced are structured to produce meaning. Interestingly, languages are similarly structured: This is why we can group languages into SOV (Subject-Object-Verb), SVO (Subject-Verb-Object), and VSO (Verb-Subject-Object); or analytic, synthetic, and polysynthetic; or isolating, agglutinating, fissional, and modulating. There is symbolism in speech, enabling the words realised from the combination of sounds to be used to represent objects, actions, and concepts that do not have any semblance with the words that represent them. The issues raised here are not generally agreed upon by scholars because some of the claims could not be conclusive when humans are yet to know all they should about the communication systems of animals (McGregor, 2009).

Summary and Conclusion

Understanding acoustics through the study of sound in human and animal communication is a fascinating exercise. The use of sound by humans and different animals is crucial to their communication systems. Humans use speech comprising speech sounds for communication. The ability to use language to express abstraction, imaginary concepts, share all manner of stories, express emotions, and creatively express whatever they want, no matter how complex or peculiar they might be, makes humans claim that language is a complex behaviour, unique from other communication methods, and species-specific to only the human species. Animals use sound to communicate effectively to signal hunger, sexual excitement, fear, happiness and other feelings to the members of their species. However, the debate as to whether the communication sounds of animals qualify for language would continue until there comes a time when there is conclusive evidence to support or refute the claim. Such a time is feasible, especially with the advances in AI and technology, though the time may not be soon.

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