Walk the Dog
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In association with Dog Listener

The five senses which man and dog share and which is important to man

Man and dog share the same five senses; these are smell, taste, hearing, sight and touch. However, the efficiency of the senses differs from man to dog, as some senses are more highly developed while others are deficient compared with those of humans. Where dog's senses are more sophisticated compared to humans, such as the sense of smell, man has taken advantage of this. Therefore some of dog's natural senses hold more value to humans than others. In order to understand which of dog's senses hold the most value, we must firstly look at the senses one shares with dog and understand how they differ from one species to another.

Like man, dog is a predatory animal which means its main source of food is prey the animal has caught itself. This means dog has to engage in a natural predatory or hunting behaviour and this follows a sequence of searching, tracking and stalking, selecting prey, chasing and killing it. Dogs use their senses for survival; for example, to locate possible food sources and be alert to potential dangers within the environment dogs will use their senses of smell, hearing and sight. But perhaps the most acute of all their senses is the olfactory sense – the **sense of smell**. The average dog has around 220 million scent receptors in its nose, compared to a human who has around five million. Couple this with the fact that dogs have an added brain capacity devoted to smell (approximately four times larger than humans)[1]; it is not surprising that they are more sensitive to odours than humans are.

The dog's nose is a highly sophisticated tool; the tip of the nose (referred to as the rhinarium or nicknamed the 'leather') is typically moist and cool to touch. This moisture is caused by a covering of mucus and its main purpose is to assist in the collection of odour molecules. All odour molecules are chemicals that can be dissolved in water. The mucus that is on and inside the dog's nose acts in a similar way to Velcro, in that when the odour molecules touch it, they stick onto the surface, then the molecules dissolve in the mucus. If there is not enough mucus to moisten the nose, the dog will lick his nose to provide additional collecting power. Inside the nose there are hair cell like structures that keep the mucus flowing back into the nasal cavities. These hairs push the dissolved odour particles inward, concentrating them near the special scent-detecting cells that can identify the smell. It takes a lot of mucus to keep this scent system working efficiently and this shows up particularly in some breeds in the guise of drool. An average size dog produces about a pint of mucus a day, so it is no surprise that dogs will drink a substantial amount of water over the course of the day. When the dog sniffs, the air that is captured passes through the tip of the nose via the nostrils up to the nasal cavity. The nasal cavity is a boney shell divided into parts or chambers – the

[1] *Internet: Spittzer, Anne & Bernard (2009) What Makes Us Human, American Museum of Natural History. Website: http://www.amnh.org/exhibitions/permanent/humanorigins/human/human.php*

front part is the specialised scent organ also referred to as the *Jacobson's organ* (canalis incisivus). The Jacobson's organ contains a pouch of special receptive cells located above the roof of the mouth. This area is very important to the dog; it contains a large number of nerves and has a rich blood supply, and there is a special region called *the olfactory bulbs* in the brain which is dedicated to processing the information from the Jacobson's organ.

Both chambers in the nasal cavity contain air conducting passages made up of mucus covered cartilage and bony tubes called 'turbinates'. The mucus in the turbinates contains most of the scent-detecting cells and nerves (or 'analyzers') that carry the information to the brain. In humans, the whole area containing these odour analyzers is about one inch squared. However, in dogs this area, if unfolded, can be as large as 60 square inches. The size of the area of turbinates depends on the size and length of the dog's nose. For example, dogs with longer and wider noses (known as 'dolichocephalics') such as German Shepherds have a larger area compared to a Pug that has a flat face and short nose (short noses dogs are also referred to as 'brachycephalics'). Dogs with longer and wider noses have more smell receptors in their nose which means they have a greater scenting ability. Typically, German Shepherds have around 225 million scent receptors compared to the champion of scenting, being the Bloodhound, which has around 300 million scent receptors in his nose. The varying degrees of dog's scenting ability from breed to breed was documented by John Paul Scott and John L. Fuller, who placed untrained Beagles, Fox Terriers and Scottie dogs in a one acre field and released a mouse. It took the Beagles around a minute to locate the mouse, the Terriers took fifthteen minutes, and the Scotties never found the mouse![2] Brachycephalic dogs that have a highly developed scenting ability are of high value to humans and are commonly used for tasks such as tracking missing persons, digging underground, tracing toxic substances (e.g.) gases, that are undetectable by humans. We will discuss the value of dog's senses to man later in this essay.

Therefore, the world of scents and scenting carries far more weight and detailed information for a dog than its sense of sight for example. Dogs seem to have their noses to the ground all the time as this world is rich with olfactory information, and their scenting ability to find a food source is a pre-wired behaviour. Through scent, dogs can understand who or what has been in the environment. And, dogs use their sense of smell as a communications tool; when an animal is, for example, angry or frightened, hormones are secreted and a dog can 'read' these signals. "If reading scents is, for dogs, the equivalent of reading a written message, then the canine equivalent of ink is urine."[3] This is why as dog owners, we typically see our dog sniffing objects like lamp posts or trees to read the 'pee mail' of who or what has recently passed by. Our dog's

[2] *Book: McConnell, Patricia B (2002) The Other End of the Leash, Ballantine Books, chapter 4, page 77.*
[3] *Book: Coren, Stanley (2000) How to speak dog, Simon & Schuster UK Ltd, chapter 16, page 250.*

typically then 'graffiti'' over that scent with his own to put his mark on that spot or rather stake his claim to that territory. Therefore, smell is used as a classification tool rather than discriminating odours, in that smells indicate to the dog if this is useful or useless, friendly or dangerous. For humans, our scenting ability is feeble compared to that of the dog, yet we are still able to recognise over 10,000 different odour molecules and detect smells in very small quantities[4], from the mouth-watering smell of freshly baked bread to the pungent smell of sulphur.

The human nose has a dual purpose as it not only aids us with detecting smells but it is the main organ of taste. The **sense of taste** (gustation) is centred on the tongue and its superficial sensory cells known as taste buds act as receptors; these are arranged in groups so that differing on the tongue. The dog's sense of taste is more poorly developed compared with that of humans. The human mouth contains approximately 9,000 taste buds compared to the dog which, according to research has 1,706.[5] Taste buds are located mainly on the tongue and help to distinguish four qualities; sweet, sour, bitter and salt. All other tastes are detected by olfactory receptors located high in our nasal passages. As dogs demonstrate taste preferences it is likely that they can also detect the four qualities of sweet, sour, bitter and salt. However, it is not known whether their smaller number of taste buds indicates less ability to distinguish between taste subtleties, although this is likely.

In addition, it is thought that dogs have additional primary taste receptors (like cats), that can respond to water. This means dogs may be able to taste different types of water. Humans and dogs palatability is very different. A human will typically resist eating something that smells bad, while dogs are the opposite; the smellier the better! Studies of dogs trained to validate specific flavours show their selections are made primarily by the sense of smell instead of taste. Therefore, dogs are more preoccupied with the smell of the substance than the taste of it, whereas a human tends to be more particular, perhaps even refusing to eat something if it does not look very appealing. Typically, dogs will eat almost anything without much discrimination, as they are opportunist feeders and their survival mechanism is so great that if there is a food source there for the taking, they will take it. The dogs sense of taste is not as well evolved as humans, although there is evidence that dogs can distinguish taste to a degree. According to Roger Abrantes, it has been observed that wolves may develop preferences towards certain prey, and when given the choice they pick one rather than another. Behavioural processes involved in food selection can change in response to experience. "Taste buds develop before birth in some mammals…[after birth] the neonate is suckled by the bitch, whose milk will vary in quality and flavour depending on what she has eaten."[6] This means dogs that experience a number of different flavours in their early years, may

[4] *Internet: Sense of Smell Institute (2009)How does the sense of smell work, The Fragrance Foundation, Research & Education Division, lesson 1. Website http://www.senseofsmell.org/feature/smell101/lesson1/01.php*
[5] *Book: Fogle, Bruce (1990) A Dog's Mind, Penguin Group, chapter 3, page 28.*
[6] *Book: Serpell, James (1995) The Domestic Dog, Cambridge University Press, chapter 7, page 108.*

accept a variety of tastes better as adults. Interestingly, taste experience in the womb has also been suggested to play a role in the establishment of taste preferences and aversions expressed after birth. Studies made by Smotherman in 1982, found that 'in utero' exposure to apple solution in rats resulted in an increased preference for that flavour later in life. Scientists Pedersen and Blass, in the same year, found similar effects were produced by odours experienced in the womb. It therefore seems reasonable to assume that similar effects occur in young dogs that may represent the first stage in the development of flavour preferences. More recent studies of taste in dogs by Katherine Houpt at Cornell University, showed that female dogs have a greater preference for sugared diets than the male dogs tested, and all the dogs preferred their own food warm to cold. Houpt also observed that the dogs' preferred canned or semi-moist food to dry foods, and that smell not taste, was the important factor in establishing a preference for one meat over another. Gustation also protects both humans and dogs from eating unsafe foods, and like us, dogs have the capacity to associate tastes or flavours with health problems. For example, if a dog is sick after eating some type of food it may refuse to eat this specific food for a period of time. This behaviour is an instinctive defence mechanism, aimed to keep the dog from eating toxic substances in a frequent way. Similarly, if a human was to eat something rotten or poisonous the instinctive reflex would be to spit it out immediately. The sense of taste enables the body to maintain a consistent chemical balance in the body. For example, humans may crave a sour food such as an orange as the body may need the essential vitamins contained within that fruit. One could perhaps suggest that when, for example, a dog eats grass this may be due to the dog's body craving the necessary chemicals or fibre contained within the grass.

Dogs, like humans, have special areas of the brain that control specific activities. For instance, in both people and dogs the hearing function is located at the sides of the brain, near the temples. Yet the actual **sense of hearing** differs greatly between man and dog. The ear is divided into three parts; the outer ear (pinna), the middle, and the inner ear. The inner ear is housed in the temporal bone and is the most complicated part of the ear. It is divided into two systems which deals with hearing and balance.[7] Although loud noises can stimulate a response from a neonatal puppy, it is not until the pup is about twelve to fourteen days old that its external ear canals open and that a clear response to a loud noise is evident. A study by P.W.B. Joslin from 1972 to 1974 with grey wolves, led to a belief that dogs can hear approximately four times the distance humans can. However, this has been disputed by many including Stanley Coren, who says, "for some sounds a dog's hearing is really hundreds of times better than ours, whereas for other sounds dogs and humans have the same sound sensitivities."[8]

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[7] *Book: Turner, Trevor (2006) Veterinary Notes for Dog Owners, chapter 17, page 290.*
[8] *Book: Coren, Stanley (2005) How Dogs Think, Pocket Books, chapter 3, page 46.*

In order to understand the sense of hearing, one should first ask what are sounds? Sounds are travelling changes in air pressure that hits the ear. The ability to detect sounds depends on the volume of the sound and the frequency (whether it is heard as either high or low pitch). Sounds vary in pressure creating a rhythm which is described as a wave pattern. The frequency of the waves depends on the number of times it cycles from one peak until the next in one second. These cycles are measured in units called Hertz (Hz). Sound waves with high frequencies are heard as high pitched, and conversely sound waves with lower frequencies are heard as low pitched sounds. Hearing tests known as 'brainstem auditory evoked response' (BAER) have been developed to test hearing ability. BAER detects electrical activity in the inner ear (known as the 'cochlea') and auditory pathways in the brain in much the same way that an antenna detects radio or TV signals. During testing short bursts of sound are sent into the ear and the brain's response is recorded by computer. Resulting data shows the largest difference between man and dog's hearing is the frequency range. The range of hearing for man is up to 20,000 cycles per second (cps) and for dog up to 40,000cps. Man and dog's hearing ability is similar at the lower end of this scale. Dog's can hear ultrasound (sounds that are imperceptible to normal human ears) and can hear sounds of low very frequency at 15 cps. The dog's ability to hear ultrasound formed the basis of the development of the 'silent dog whistle', used as a signaling device, especially for recall. The frequency range of a dog whistle is largely out of the range of human hearing. Typically, a dog whistle is within the range of 5800 Hz to 12400 Hz. The dog's ability for hearing high pitched sounds as Fogle neatly puts it "is an aspect of the wolf in him",[9] as small prey like mice and other small mammals would form part of the wolf's diet. The dog's hearing is more acute in the 1000-8000cps range.

Another hearing advantage dog has over man is their ability to move their ears, which helps them locate the origin of sounds coming from a distance. The external ear (pinna) is made of cartilage and covered with skin on both sides. Movement is effected by tiny muscles, although this is restricted to prick-eared dogs or semi-pricked eared breeds.[10] The pinna helps to pick and locate the sound and moving the head provides the dog with additional information about distance.

A dog's **sense of sight** differs from a human's. The visual system in man uses a greater proportion of the brain and has more neurons to process and transmit information than any of our other senses. This means humans interpret the environment based on what is seen, more than any other sense. Whereas, the dog's visual system is not as dominant as our own; their interpretation of the environment is less strongly on what they see. Another difference is that human eyes are positioned toward the front, where as dogs' eyes are placed more to the side of their heads, this gives them a more panoramic view of the world. Furthermore, dog's have a greater sensitivity to peripheral

[9] *Book: Fogle, Bruce (1990) A Dog's Mind, Penguin Group, chapter 3, page 31.*
[10] *Book: Turner, Trevor (2006) Veterinary Notes for Dog Owners, chapter 17, page 288.*

movement compared to humans, although their vision up close is poor. Dogs' panoramic field of vision is 250-270 degrees, but their binocular vision varies from breed to breed. The more that a dog sees laterally, the less well it sees straight ahead. Binocular vision typically takes six weeks to develop in a puppy and it is the ability to maintain visual focus on an object with both eyes, that creates a single visual image. Lack of binocular vision means the individual will experience distortions in depth perception and visual measurement of distance. Pekinese dogs, for example, have a binocular vision around 85 degrees, Greyhounds around 75 degrees, cattle around 25-50 degrees, and humans approximately 140 degrees. Therefore, a human may clearly see an object but to the dog this might appear blurred from the same distance. A rough estimate is that dogs have about 20/75 vision. This means they can see at 20 feet what a normal human could see clearly at 75 feet**.**

A dog will track its prey with its sense of smell, but when it comes close enough to see the prey, his sense of sight confirms his trail. However, the prey may run away as the dog approaches, and once the prey is in motion it is far easier for the dog to track, as its eyes become more 'useful information gathering devices'. Therefore, many prey animals have evolved the instincts to take advantage of dog's visual limitations; the potential 'kill' will freeze as an effective way to elude detection by the dog, this is because when something is motionless it becomes virtually invisible to a dog. Dogs are primarily diurnal, meaning they are more active around dusk and dawn. In order to see more efficiently in low light, unlike humans, dogs have a layer of tissue located behind the retina called the tapetum lucidum. This acts like a sort of mirror, where light bounces of it increasing the sensitivity of the eye in dim light. We can often see the visible effect of the tapetum when a light is shone into the eye of a dog or when caused by the flash of a camera when his picture is taken, for example. The tapetum will reflect the light and the dog's eyes appear to shine.

Humans and dogs' perception of colour differs. Twilight and night-time activity requires sensitivity to low levels of brightness, add this to the fact that the dog's prey is often camouflaged with its surrounding, the perception of colour becomes secondary to the dog's needs. Both human and dog eyes are lined with rods and cones; these give us our ability to see small details and are responsible for the perception of colour. Rods work best in low light and are used for motion detection. Dogs have significantly more rods than cones in their eyes. Humans have three different cones types (trichromat) where as dogs have two (dichromat). Each cone contains a 'photopigment' that is sensitive to a separate wavelength of light, and these photopigments are what makes colour perception possible. It used to be thought dogs are 'colour blind', only able to shades of black and white, but scientific studies, such as those conducted by Neitz, Geist and Jacobs at the University of California, concluded that dogs have colour vision and they see in rudimentary colour such as yellows, greens and blues, rather than simply in grey shades.

Dogs also have a third eyelid (also known as the 'haw') which humans do not have. This additional eyelid is a membrane that protects the eyeball from irritants and is sometimes visible in front of the eye. When danger threatens the eye, the eyelids close and the eyeball is pulled into the orbit (the depression in the skull), this action causes the third eyelid to slide over the surface of the cornea. Typical damage to the third eyelid can occur as a result of an altercation with a cat's claw!

The fifth sense is that of the **sense of touch**, and this is an important sense as it aids communication and humans typically enjoy physical contact. For humans, our skin lets in the sense of touch; the skin is the largest sense organ in our body and touch is one of the five senses we tend not to lose, unlike sight or hearing. Touch enables us to determine if something is warm or cold, helps us respond to pain as well as light touch and deep pressure. Touch, however, does more than just detect physical contact with our body; it helps us have an understanding of our environment. Early in life our brain and bodies rely on the sense of touch to enable us to grow. Research suggests babies that are touched grow a lot faster than if they are not touched. In fact, babies not exposed to frequent touch have shown delayed growth in development.

Dogs also have a well-developed sense of touch, even if it is less sophisticated than a human's. All dogs are born with a sense of smell and touch; during the neonatal period the puppy uses its taste reflexes and nerves to sense the warmth of its mother and any movements away from the dam will cause the puppy to experience a temperature drop, in turn the puppy will vocalise its distress until it is rescued by its mother. How the puppy locates it mother's nipple to get that all important meal is achieved by using its sense of touch and taste sensitivity. Using these two senses the puppy will find its way to the mother's breast area to suckle. The puppy's ability to find its mother's teats and warmth is referred to as *biotonu*s. While receptors in the new born puppy's nose help lead it to its mother, it is the sense of touch, the physical contact with the bitch that has a calming affect and soothes the pup. Because touch is a sense that is generally well developed at birth, Bruce Fogle suggests it is "possibly the most important of all the canine senses…and is overwhelming important for the development of a mature and sensible mind". Research has shown that animals deprived of touch are more likely to show serious behavioural disturbances and may be more fearful and withdrawn. While other research has indicated that puppies raised in isolation do not seem to know how to avoid painful stimuli and may also perceive pain differently.

A puppy's reaction to touch or its 'touch sensitivity' is considered when testing a young dog's temperament and its aptitude. Behaviourists such as Joachim and Wendy Volhard, Clarence Pfaffenberger, Fortunate Fields and William Campell, have all developed such tests that include reaction to touch. This is because all dogs are sensitive to touch and they use this sense to communicate to one another, as well as their human counterparts. It is often considered that if, during testing, the dog is too sensitive to touch, that dog may be harder to handle and train.

When training dogs, we tend to use the sense of touch by way of a stroke on the head as a way of re-enforcing a good behaviour to encourage repetition of it, such as getting the dog to perform a 'sit'.
Therefore, if a dog is overly sensitive to touch, particularly around the head and neck area where the collar and lead would touch, this makes any lead corrections difficult in training, and the owner may experience an unwanted or fearful response from the dog, if they tried to touch the dog around this highly sensitive spot. Humans, like primates, will hug or wrap their arms around one another as an act of friendship and love. While many dog owners hug their dogs to show their affection, in reality dogs do not hug. In fact, some dogs may not enjoy physical contact especially those sensitive to touch, while other dogs enjoy being stroked and petted. "The only time dogs 'hug' each other is when the male clasps the female when mating or when a dog mounts another in a dominance display, or in play."[11] Sensory receptors are located all over the dog's body, but particularly around the dog's face. The whiskers on and around the dog's face are called 'vibrissae'; these sensory hairs are typically located above the dog's eyes, under the jaw and on its muzzle. The vibrissae enable the dog to sense the air flow and current around an object, this helps the dog to determine the shape and texture of the object, as well as investigate their environment. The areas of skin where the vibrissae are attached are rich in nerve endings and blood supply, therefore the slightest of stimulus to these areas will typically cause a reaction, such as a reflex blink when the vibrissae above the eyes are stimulated, which originally may have been needed to protect the dog's eyes when out hunting.

The importance of touch continues through out the dog's life. Stroking helps relax a dog that is in a heightened state as it lowers the heart rate and soothes, but touch is also used through various techniques developed to help aid a dog's recovery from illness, injury or help with the overall well being of the dog. One such technique is called 'canine touch'. This practice is still relatively new and is a holistic discipline developed by Ivana Ruddock, a veterinary surgeon from the Czech Republic. Canine touch uses non-invasive gentle sliding strokes and pressure to the soft tissue (superficial fascia) centred around various sections of the dog's body. This technique has proved to aid in the circulation of blood and lymph, as well as boosting the immune system, detoxifying and relaxing.

So, the five senses of smell, taste, hearing, sight and touch provide both man and dog with a wealth of information that contributes to our survival. However, there are some senses that are more important to the dog, and some of the dog's senses that are more important to man. I believe the senses of smell and touch are the most important to the dog. Taking into consideration each sense that has been outlined, it is clear that touch and smell are most resistant to the aging process, and even in the shortest of nosed dog

[11] *McConnell, Patricia (2002) The Other End of the Leash, Random House Publishing, chapter 1, page 17.*

breeds, the olfactory centre is still relatively highly developed. From the moment the dog is born the sense of touch enables the dog to develop, and investigate its environment. While the dog's sense of smell, enables him to determine a possible food source needed for its survival, and alert him to possible danger. Smell and touch are also used by dogs in communicating with on another and humans. For example, dogs that are comfortable with one another will happily accept the touch of another leaning on or partially against the dog, as a mark of companionship. And, typically when dogs meet one another they will participate in a 'bottom sniff', which is the human equivalent of a handshake. Sniffing one another enables the dogs to find out vital information about each other's state of health, age, sex and their emotional state.

I believe that the dog's sense of smell holds the most value to man. The dog's superior scenting and tracking ability serves humans in many ways. Most people are aware of the work of search and rescue dogs who track missing people and about drug-sniffing dogs that can search out explosives, guns and other contraband, as well as cadaver material. But an illustration of the high value of this sense to man, is demonstrated with the sheer number of dogs employed by the US Customs and Border Protection that work with the US Department of Homeland Security to combat terrorist threats, stop the flow of illegal narcotics, detect unreported currency, concealed humans or smuggled agriculture products. Its Canine Enforcement Programme has over 800 canine teams made up of a variety of breeds including; German Shepherds, Labrador and Golden Retrievers, Belgian Malinois, Beagles and many mixed breeds.

Dogs are also used in helping man locate gas and other flammable liquids, water leaks, endangered species, termites, bedbugs, and weeds that are hazardous to agriculture. Dogs that are used in search and rescue are classified as airscenting, tracking or trailing according to SAR-DOG (Search and Rescue Dog Information & Resources). Dogs that use airscent to track, rely on scent deposited on the ground by the individual; these dogs are typically German Shepherds and Border Collies. Airscent dogs will be used in areas of wilderness to track the places where the missing individual may be or likely to have passed. Where as tracking and trailing dogs, are usually scent discriminating and need to have an uncontaminated scent article from the individual in order to follow the individual's path.

Medical research has indicated that dogs' sense of smell may help alert us to diseases such as cancer. Researchers have carried out various experiments to test out the theory of whether dogs can smell cancer. One such trial was carried out at Amersham Hospital in Buckinghamshire in 2003. Scientific researchers conducted a seven month trial in which six dogs were trained to identify the smell of urine from patients with bladder cancer. "Tumours produce volatile organic compounds which are released into the atmosphere through breath and sweat…these are likely to have distinctive odours…they could be detectable by dogs with their exceptional olfactory acuity." [12] The

[12] *Internet: Boseley, Sarah, The Guardian, Study finds dogs can smell cancer, 24th September 2004. Website address* http://www.guardian.co.uk/society/2004/sep/24/medicineandhealth.lifeandhealth1

dogs were tested to see if they could select the one cancer sample out of seven samples given. The dogs chose the correct sample by lying down next to it, on 22 out of 54 times. Although this was a low success rate of 41 per cent, what the six dogs did spot, was cancer in the urine of a man who was thought to be cancer-free whose sample was used as one of the controls. Further tests on this man found he had a kidney tumour.

Increasingly, dogs are being used to aid patients suffering from epilepsy. Interest in 'seizure dogs' came about in the 1980s, following a story in the United States of a female prisoner involved in a research project with dogs. It was discovered that one of the dogs seemed to know whenever she was going to have a seizure. Seizure alerting dogs (known as SADs) are trained to bark or alert family members when the sufferer has a seizure or are taught to lie next to the patient to prevent injury. However, according to studies of 77 epileptic dog owners made by Roger Reep in 1998, 10 per cent of those

surveyed felt their dog sensed when they were going to have a seizure, despite not being a trained 'seizure dog'. In addition, 28 per cent said their dog stayed with them during their fit. Many believe it is the chemical changes in the human's body which produces a particular odour that may be the reason for dogs sensing impending danger.

In conclusion, studying the senses of the dog is important as it helps us understand how they communicate. All animals live in a world of signals and every species specializes in the specific use of a range of signals. A dog's representation of the environment must be very different to ours, since human senses differ so much. The dog has a better sense of smell and hearing, while we are more visually orientated. Humans have put dogs' superior senses to use for his own benefit and gain. But in essence, both man and dogs' senses are the building blocks which thoughts and actions are constructed. As Protagoras the Greek philosopher puts it, "we are nothing but a bundle of sensations."[13]

[13] *Book: Freedheim, Donald (2003) Handbook of Psychology, John Wiley and Sons, volume 1, chapter 5, page 87.*