

Science quest-An inquiry into human body behaviorism

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Abstract

The human body can be called a living machine. It starts as a single cell no bigger than a full stop, but contains all the instructions to make a complete human being. Here, each part is perfectly formed for the job they have to do to keep a person alive and healthy. Thus, this paper seeks to provide scientific reasons and explanations to some of the questions and curiosities about why certain common physiological conditions occur the way they do.

Keywords: Human body behaviorism; Yawn; Stomach growl; Snoring; Hiccup; Shedding tears; Hair loss; Bad breath; Leucoderma; Beautiful voices.

1. Introduction

Although we all look different, we are identical in the way our bodies are constructed and function. Each human body is built up from twelve major systems, each of which contributes to the body's normal functioning. The way these systems function to keep us alive and healthy is just amazing, as a result of which it can be called a living machine. In fact, it has features that make it far superior to any machine humans have yet invented.

Unlike the man-made machines, our body can increase its size as it works, slowly adjusting the shape of its parts as they grow, until they are perfectly formed for the job they have to do. One may not stop wondering how our body machine maintains and repairs itself. For example, our joints are so well oiled that they work for so many years without signs of wear, and cuts that leak blood are so quickly plugged and soon mend by itself. Moreover, our body machine not only controls itself but is aware of what it is doing. Apart from controlling its movements, it controls many internal processes such as breathing, blood flow, body temperature, and the amounts of chemical in the blood stream. The fact that our body controls all these processes without a single thought is just fascinating.

Are we not gifted to possess such a living machine? According to the Buddhist philosophy, to be born as a human being is a very difficult and rare opportunity. That is why we value this life and our living machine more than anything else in the world. The proper functioning of this body machine has been interpreted as "good health". Good health is a universal desire because it is the most important factor that determines a person's overall wellbeing and happiness in life. Fortunately, in this modern era, people are becoming increasingly conscious about their health, due to which they become more curious and interested to explore the arena of health education.

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This paper attempts to put meaning to everyday life experience of certain common biological occurrences and conditions that are associated with our body. These symptomatic processes are generally viewed as normal and are often ignored. Apart from some myths about their causes, we don't really get on to understand the scientific reasons of their causes. Hence this paper is a quest to discover scientific information on some interesting aspects of why certain physiological mechanisms occur the way they do. These include some bodily noises such as, yawns, rumbling stomachs, snoring, hiccups, and some inexorable conditions such as white skin, baldness, bad breath and crying.

2. Why do we yawn?

It's widely assumed that yawning occurs because we are tired or bored or because we see someone else doing it, but there isn't any hard evidence to support these beliefs. Scientists believe that a yawn is an involuntary respiratory reflex, which regulates the carbon dioxide and oxygen levels in the blood. They speculate that the onset of a yawn is triggered either by fatigue or by sheer boredom as, at those times, breathing is shallow, and little oxygen is carried to the lungs by the oxygen-carrying cardiovascular system. When one yawns, his or her alertness is heightened, as the sudden intake of oxygen increases the heart rate, rids the lungs and the bloodstream of the carbon dioxide buildup, and forces oxygen through blood vessels in the brain, while restoring normal breathing and ventilating the lungs.

Therefore, it is a common wisdom that people yawn because their body needs enough oxygen. However, researchers at the University of Albany in New York had suggested that yawning occurs when our brain temperature rises. As a result, drawing in air during a yawn helps to cool the brain to make it work more effectively. The study revealed that those who breathed through the nose rather than the mouth were less likely to yawn. This is because when inhaled air passes through the nasal cavity it cools the blood vessels in the nasal cavity, thereby delivering cool blood to the brain. The same effect was found among those who held a cool pack to their forehead, while those who held a warm or room temperature packs yawned more frequently.

3. Why does our stomach growl when empty?

Is hunger the reason for your stomach to growl? One may find it difficult to believe that hunger actually has nothing to do with an empty stomach. Instead, studies suggest that it is a result of certain nutrients missing in the blood. Our brains contain a "hunger center," which has direct control over our stomach. When our stomach becomes empty, the concentration of essential nutrients becomes low in the blood, which circulates through the brain. As a result, the brain stimulates the stomach walls to squeeze together in an attempt to mix and digest food. When there is no food in the stomach, gases and digestive juices slosh around in the empty stomach producing a grumbling/rumbling sound. Such conditions can sometimes put us in great embarrassment, especially during a quiet gathering.

If ever such a situation should arise and there is no food in sight, we can try to remain calm because the calmer we are, the more slowly our body will metabolize the protein it has stored, and the longer we will live!

4. Why do people snore when they sleep?

Snoring is often a nuisance as it disturbs not only the sleeping patterns and deprives the snorer of appropriate rest but also makes the snorer an object of ridicule and causes others sleepless nights and resentment. Medical experts point out that when snoring is severe, it can cause serious, long-term health problems, including obstructive sleep apnea. Problem of snoring is more frequent in males and overweight persons, and it usually grows worse with age. But, what exactly causes snoring? Biologists and clinical experts explain that the noisy sounds of snoring occur when there is an obstruction to the free flow of air through the passages at the back of the mouth and nose. This area is the collapsible part of the airway, where the tongue and upper throat meet the soft palate and uvula. Snoring occurs when these structures strike each other and vibrate during breathing.

Snoring may be caused due to poor muscle tone in the tongue and throat. When muscles are too relaxed, either from alcohol or drugs consumption, the tongue falls backwards into the airway or the throat muscles draw in from the sides into the airway, which usually happens during sleep. Snoring may also be a result of excessive bulkiness of throat tissue. Children with large tonsils and adenoids often snore. Overweight people have bulky neck tissue, too. Long soft palate and/or uvula may be another cause of snoring. A long palate narrows the opening from the nose into the throat. As it dangles, it acts as a noisy flutter valve during relaxed breathing. A long uvula makes matters even worse. Obstructed nasal airways can also be a cause of snoring. A stuffy or blocked nose requires extra effort to pull air through it. This creates an exaggerated vacuum in the throat, which pulls together the floppy tissues of the throat producing the sounds of snoring. So, snoring often occurs during the hay fever season or with a cold or sinus infection.

5. Why do we hiccup?

Most of us have experienced hiccups, an uncomfortable, sometimes embarrassing, but usually short-lived experience. But sometimes hiccups persist for a long period of time and may require medical attention.

The precise reason we hiccup is unknown. Many medical dictionaries describe hiccups as “a spasmodic inhalation with closure of the *glottis* accompanied by a peculiar sound.” The phenomenon is nearly universal and it can even be observed in a fetus, especially during the last trimester of pregnancy. Hiccupping is a complex reflex: a sudden contraction or spasm of the diaphragm and the muscles between the ribs makes you inhale quickly and involuntarily. It ends with a *glottis closure* whereby, the space in the throat near the vocal cords snaps shut, producing the typical sound.

While most of the time hiccups are simply a normal part of the human condition and, as annoying as they may be, they rarely last long. However, in some extremely rare cases, the underlying cause of hiccups can be pleurisy (i.e. inflammation of the membrane lining of the lungs and chest cavity), pneumonia, certain disorders of the stomach or esophagus, pancreatitis, alcoholism, or hepatitis. Any one of these conditions can cause irritation of the diaphragm or of the phrenic nerves that supply the diaphragm, which results in the production of hiccups.

Most simple cases of hiccups come after eating or drinking too much or too quickly. The stomach, which is situated right below the diaphragm, becomes distended and irritates it. This will cause the diaphragm to contract, as it does when we breathe in. Sometimes hiccups will occur because of a disturbance to the nerve pathways from the brain to the muscles involved. This explains why hiccups may occur with temperature changes or emotional situations. It is also the reason that a sudden shock can sometimes abolish an attack.

Everyone has their own pet remedy for curing hiccups. Simply holding your breath is often said to be effective. Breathing into a paper bag may help as this increases the amount of carbon dioxide in the lungs, relaxing the diaphragm and halting the spasms.

6. Leucoderma (White skin)

Leucoderma also known as *vitiligo*, is a distressing skin condition. The word literally means white skin. The victim of such disease is humiliated and boycotted by people. This is really an unfortunate condition. Whether male or female, the victim feels depressed because the disease not only ruins the physical charm but also makes the victim an object of social humiliation.

The skin consists of dark pigments medically known as melanin, which is responsible for giving colour to the skin. With the passage of time, surface of the skin continues to be invisibly thrown off and constantly renewed from below and thus maintains its colour naturally. If *melanocyte* stops the process of making *melanin*, then, in such cases this disease exhibits itself by showing a white patch on that part of the body. The abnormal functions of *melanocyte* are not yet known.

The problems usually start with a small white spot, which later develops into patches. These patches are pale in the beginning, but become whiter and whiter as time passes by due to loss of pigments. As the spot enlarge they merge into each other and in course of time form a very broad patch. In some cases most of the skin of the body may be covered by with white patches. However, white patches need not always spell a doom. Only a fraction of them could be the dreaded Leucoderma. The white patch would probability be Leucoderma if it:

- Has an outline darker than the skin.
- Is irregular in appearance.
- Gradually increases in size.
- Appears milky white under an ultraviolet light.

Despite advanced research, medicine is still trying to figure out the exact cause (leave alone the most appropriate treatment!) of Leucoderma. There are numerous theories as to what could cause this disease, of which three have been widely accepted. The first theory is one of mistaken identity. The immune system mistakes the pigment cells (melanin) for foreign bodies and destroys them. The second theory states that certain chemical agents destroy the pigment generating cells (the melanocytes), while the third theory states that the cells are destroyed due to chemical exposure. Whatever the cause, the course of the disease is certain - and that is the destruction of pigment cells.

7. What causes hair loss?

Doctors refer to common baldness as *androgenetic alopecia*, which implies that a combination of hormones and heredity (genetics) is needed to develop the condition. Even men who never become bald thin out over the years. Adolescent boys notice some thinning near the temples as their hairlines change from the straight-across boys' pattern to the more "M-shaped" pattern of adult men.

The causes of hair loss remains quite a controversial issue as there is no common proven evidence about it. As a matter of fact, different studies have their own opinion on this problem and develop their own ways of treatment accordingly. So this section includes a synopsis of different views of medical professionals taken together.

Some medical professionals consider the male hormone *testosterone* to be the major cause. *Testosterone* is closely connected with heredity. If a man has inherited the necessary genes for loss of hair, a little of *testosterone* is formed by some of the hair roots into a derivative called *dihydrotestosterone*. And in fact, it is *dihydrotestosterone* that is responsible for hair loss. *Dihydrotestosterone* is present in the surface *sebum* (oil in the scalp) of hereditably predisposed people. When a hair is shed *dihydrotestosterone* enters the follicle and reacts inside it chemically. *Dihydrotestosterone* miniaturizes the hair root and follicle and the new hair growing through it will be finer. When the new fine hair falls away, *dihydrotestosterone* again miniaturizes the follicle and hair root and so on until baldness occurs. Thus, male hormone *testosterone* is the contributor of baldness. Since male hormones start functioning when a man is sexually mature, there's little danger of hair loss before puberty.

Another point of view that contradicts to some extent, to the theory of inherited disposition focuses attention on the blood flow. According to this view, it is not *testosterone* that is considered to be the main reason for hair loss but a poor blood flow to the scalp. Insufficient nutrients in the blood that circulates through the scalp and poor drainage of waste products through the lymphatic systems can result in the loss of hair. Based on this view, medical professionals develop appropriate ways of treatment that center around the increase of the quality blood flow into the scalp.

Some hair experts believe that loss of hair in men and women is also caused by excessive oil in the scalp. This oil, which is also called sebum, clogs the pores of the scalp and stifles follicle growth. The hair root is asphyxiated, making it impossible for new hair to grow. If the scalp is not cleaned properly sebum becomes wax that clogs the pores. Thus, the new hair cannot come out. A few hairs that manage to push through this wax are so weak that they are ready to fall out at any time. Three factors mentioned above are believed to be the most common causes of baldness. In addition, the following can also be some of the important contributors of balding:

- emotional strains, stresses and nervous disorders,
- aging,
- infections,
- hormonal imbalance,
- polluted environment,

- toxic substances,
- injury and impairment,
- radiation.

A combination of these factors can considerably speed up the process of hair loss or balding, which is one of the most hated phenomena of human body.

8. Causes of Bad breath

Do you fear your breath is strong enough to scare small children? You might be mistaken. People are notoriously inept at assessing the odor of their own exhalations. A breath-mint addict who constantly worries about his breath may never have had a problem. At the same time, a person with truly noxious breath may be baffled when friends start offering mints or backing away during a conversation.

Bad breath, technically known as *halitosis* can often be annoying or embarrassing. But what really causes a bad breath? According to clinical experts, most cases bad breath is caused by the presence of oral bacteria. However, there can be other possible factors that influence the odor associated with one's breath. In fact, the quality of a person's breath will ultimately depend on a number of different variables, such as, stomach and intestinal disturbances, bowel sluggishness, sinus or throat infections, and tobacco and alcohol use.

Even if we don't have much of a problem with bad breath we sometimes notice that our breath is least pleasant in the morning when we first wake up. This is because during the night a person's mouth dries up somewhat, due to the human body's natural mechanism to reduce salivary flow when a person sleeps. A similar effect is sometimes noticed by teachers, lawyers, or anybody whose mouth has become dry after having to speak for a prolonged period of time. Further, people who breathe through their mouth, are fasting, or else are under stress can find that they have comparatively dry mouths and therefore suffer persistent problems with breath odors.

One explanation for this phenomenon is that the saliva found in our mouth is a very special form of mouth moisture. It's the body's natural mouth rinse. The presence of saliva in our mouth causes us to swallow it. With each swallow of the oral fluid, we wash away bacteria, as well as the food and debris on which they feed. This same moisture also dilutes and washes away the waste products that oral bacteria produce. Beyond the washing and diluting effect that any oral moisture can provide, saliva has the added benefit of containing compounds that can kill bacteria and buffer their waste products. So, when our mouth becomes dry, all of the benefits provided by each source of oral moisture are minimized. The net result is that the conditions for bacterial growth are enhanced while the neutralization of bacterial waste products is reduced.

Some people have chronic dry mouths. This condition is termed *xerostomia*. *Xerostomia* can be a side effect of the medication a person is taking. Antihistamines (allergy and cold medications), antidepressants, blood pressure agents, diuretics, narcotics, or anti-anxiety medications are each known to produce xerostomia. Another contributing factor associated with *xerostomia* can be aging. It is a common perception that as people age, they find that chronic mouth dryness becomes more and more of a problem. With age our salivary glands tend to work less effectively

and the quality of the saliva that they produce are more likely to decline. Hence, the effects of salivary cleansing and buffering are reduced, thereby resulting in the production of bad breath.

Dental problems, especially periodontal disease and tooth abscesses, can often be the causes of bad breath. These infected areas harbor large quantities of bacteria from the infection and foods eaten, which have been allowed to decay. Other dental sources are gaps between teeth or crooked teeth, both areas where food can be left to decay.

The stomach can be another area that causes bad breath problems for many people. Poor digestion, constipation, or bowel disorders may create gas which exits the mouth. Inadequate hydrochloric acid in the stomach may cause poor digestion. This undigested food will pass into the intestines, putrefy and give off foul gas which rises up and causes bad breath. This problem is also quite common with older people whose body does not produce enough hydrochloric acid naturally to aid the digestion process. In addition, bad breath may emanate from sinus or tonsil infections, milk intolerance, stress and the some food contents. Therefore, the key to ruling out bad breath is to first identify the causes and to act accordingly.

9. Why do some people possess beautiful voices and some don't?

Beautiful voices make famous singers. One may wish to become a good singer but sadly, not all of us are gifted with beautiful voices. We often wonder why some people have such melodious voices while others don't.

Using our voice is like are performing on one of the most difficult and complicated musical instruments ever known to man. Anatomically, the part of the body which is responsible for producing our voice is called the *vocal cords*. Everybody is born with them, but being able to control them is a matter of utmost precision. Human *vocal apparatus* is like a complicated instrument with walls consisting of bones, muscles, mucous membranes and with resonating spaces which are like the wooden sounding board of the violin. Among these resonating spaces are the wind pipe, the lungs, the oral and the nasal cavities, the nasal sinuses and the thorax.

The range and the quality of a voice depend on the form and the size of the resonating spaces that are shaped in such a way that they may be considered perfect musical instruments. However, having these resonating spaces alone is not enough. One must know how to control them artistically. Thus, good singers are the ones who are not only gifted with the perfect musical instruments, but have also acquired the skill of using them precisely.

10. Why do human beings shed tears?

Crying is not a grief; it is a way of getting over your grief. Trembling isn't the same as fear. Rather it is part of a letting go of fear. In the same manner, embarrassed laughter, yawning, and even rapid, excited talking are parts of the healing process that get mistaken for symptoms of the problem.

Crying, the shedding of emotional tears is distinctly humane activity. There are one or two anecdotes of elephants crying but there is little evidence that animals do weep. Although there

seems to be no researched evidence to explain the mechanism of shedding tears, three types of tears have been identified physiologically. They are: (i) basal or continuous tears which lubricate the eye, (ii) reflex tears in response to external irritants and (iii) emotional tears, which have psychological meaning.

Researches on the benefits of crying are highly intriguing but are hardly decisive. Tears produced by emotional crying differ in chemical content from those caused by irritants such as onion vapour and dust particles. Researchers suggest that emotional tears contain more protein than tears induced by irritants. They also define emotional crying as an eliminative process, by which tears actually remove toxic substances from the body.

The belief that crying has positive effects is of ancient origin. More than two thousand years ago, Aristotle theorized that crying at a drama "cleanses the mind" of suppressed emotions by a process called *catharsis*, the release of strong emotion which reduces tension and provides relief to the mind. In reality, it may seem strange to think of crying as beneficial, yet many people say that "a good cry" makes them feel better. Many people attend movies and plays that they know beforehand are, "elicitors of psychogenic lacrimation," or tearjerkers. Such people may cry freely in movies and may delight in the experience.

More advanced researches are now being carried out to examine the contents of emotional tears for substances such as endorphins, ACTH, prolactin and growth hormone, all of which are released by stress. While the research on psychoactive substances in tears is underway, there is enough reason for us to think that emotional tears may be important in the maintenance of physical health and emotional balance. So, the next time you feel sentimentally emotional do not hesitate to allow your tears rush out freely. It can be highly beneficial.

11. Conclusion

The working of human body machine is one of the most amazing phenomena in nature. As each of us are blessed with this super human body machine, it is imperative for us to get an insight of at least some interesting aspect of its physiological processes and behaviours. There is not a single individual in this world who is not craving for peace and happiness. Whatever we do, it is with the ultimate goal of achieving happiness, and happiness can only be achieved through good health. Hence, a continuous quest for knowledge and wisdom of the working of our body can serve as a fundamental basis for maintaining good health, which is the ultimate key to happiness. As much as mindfulness is important to a Buddhist, so is the scientific understanding of our own flesh and bones which constitutes our body.

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