Good example of essay on the fight and flight responses to fear

Engineering, Aviation

Introduction

The fight or flight response is one of the body's autonomic defense mechanisms. This innate defense mechanism gets triggered whenever a person encounters a harmful entity or event, or basically anything that one may perceive as a threat to his survival. In such cases, the body's hyper-arousal state which is characterized by dramatic changes not just in one but across all organ systems. The fight or flight response actually started as a simple theory by Dr. Walter Cannon. Dr. Cannon explained that any animal is subject to a reaction called fight or flight response which is characterized by a general and fast-acting discharge of sympathetic nervous system signals, a reaction that prepares the individual for either fighting or fleeing.

Research suggests that the main organ system responsible for the activation and regulation of this hyper-arousal state aside from the obvious nervous system—especially the autonomous nervous system, is the endocrine system. Endocrine glands, particularly the adrenal medulla, located near the kidney, secrete glands that create a series of hormonal secretions initiated by other endocrine glands. In short, everything starts from the adrenal medulla and after it starts secreting endocrine hormones, other glands become part of the hormonal cascade, all of which leads to a generalized body response that is the fight or flight response .

Acute stress response is one of the many names of the fight and flight response. One practical way to look at this physiologic response is that it causes the body to react rapidly to threatening situations or stimuli—which can be either mental or physical in nature, by helping the body mobilize its resources and deal with the noxious stimuli. The objective of this paper is to

discuss the fight and flight responses to fear in general, how it happens, its advantages and disadvantages, and in addition, discussion some medical conditions that may be associated with this normally occurring altered physiologic state.

How it occurs

It has to be constantly reminded that for the fight and flight response to get activated, there has to be a certain degree of disturbance that must be felt by the subject person; otherwise, the body organ systems would not be able to automatically send signals to other organ systems to secrete the necessary hormones and chemicals to activate the hyper-arousal state. Stress is one of the most common form of stimuli that effectively activates the body's hyper-arousal state. The autonomic nervous system is a subdivision of the nervous system which is the main organ system responsible for the activation of the fight and flight response. It is further subdivided into two namely: the sympathetic, and the parasympathetic nervous systems—both of which play an integral role in creating the hormonal cascade that eventually leads to the fight or flight response. Initially, the person has to encounter the noxious stimuli or basically anything that he may perceive as threatening to his survival or peace of mind such as any form of stress, and etc. This may vary from one person to another but the main idea is that the person has to feel stressed, burdened, or threatened .

Upon sensing that noxious stimuli, the afferent pathways from different parts of the body would be prompted to send signals to the brain. The brain—the

main organ component of the central nervous system, would then send signals to the hypothalamus to tell it to activate the two divisions of the autonomic nervous system—the sympathetic and the adrenal cortical system. These two systems initiate different body reactions via different means. The sympathetic nervous system initiates body reactions through the use of nerve pathways as most nervous system organs do; the adrenal cortical system on the other hand initiates body reactions in the body through the use of the bloodstream. The combined reactions of the body due to work of these two systems is what constitutes the entire fight or flight response .

As soon as the hypothalamus gets the signal to start the sympathetic system up, the general response of the body would be to increase the tension of the muscles—which explains why a person whose house is under fire can suddenly lift an entire refrigerator which is something that he could not do on a normal basis, increase the body reaction speed, increase the speed of the reflexes, increase the level of alertness. If there is a fire eating up the entire house for example, a person’s body would be prompted to react fast. It is the sympathetic nervous system that signals the body’s endocrine glands and other secreting organs such as the adrenal medulla in the kidneys to release the hormones: epinephrine (adrenaline hormone) and the norepinephrine (noradrenaline hormone) into the bloodstream. The first few reactions of the body from the initial sympathetic response would be supplemented by the succeeding reactions after the release of these two hormones which would be an increase in heart rate and blood pressures—required to mobilize the body’s resources faster. These two hormones are

also known as stress hormones .

The activation of the sympathetic nervous system by the thalamus happens simultaneously with the activation of the adrenal cortical system, also by the same nervous system organ, the hypothalamus. This time however, the hypothalamus releases a substance called the CRF (corticotropin releasing factor) into the pituitary gland first—which is one of the most important endocrine glands. The pituitary gland then activates the adrenal cortical system. The pituitary gland is the one responsible for the release of an endocrine hormone called ACTH or adrenocorticotropic hormone. The ACTH is secreted directly into the bloodstream. After traversing through the arteries and veins and reaching the renal area, particularly the area where the adrenal cortex is, it serves as the trigger for the release of over 30 different hormones which should get the body more prepared to eliminate or run away from the noxious stimuli. By that time, both the sympathetic nervous system and the adrenal cortical system have already been activated which should equate to the total activation of the fight or flight response.

It is important to remember that this series of events happen simultaneously and at a very fast pace, usually within a few seconds. The sudden release of different hormones plus the stress hormones, the epinephrine and norepinephrine into the bloodstream causes the following :

- Increase in blood pressure
- Increase in respiratory rate
- Increase in heart rate
- Dilation of the pupils—hypersensitivity to light
- Vasoconstriction of the veins in the superficial areas of the skin: this

happens so that the vascular system could flood the major muscle groups with more blood, oxygen and other resources; this vasoconstriction mechanism is also the one responsible for the chilling or cold sensation whenever someone experiences fear. The person feels cold because a huge portion of the blood that flows in the skin gets concentrated into the trunk and other major muscle groups.

- Increased blood sugar levels: this can be explained by the fact that stronger, faster, and more movements of the bones and muscles would require more energy in the form of ATP, which can usually be found in sugar or glucose.

- Increased muscle tension: it is the adrenaline hormone and the increased glucose levels that causes increased muscle tension. The increased muscle tension is also the reaction that causes goose bumps whenever one experiences fear or feels threatened. When the muscles attached near the surface of the skin tenses up, the hairs, which are also coincidentally located near the surface of the skin are pulled and are forced to be in an upright position, as the sheets of skin gets pulled by the tensed up muscles.

- Relaxation of smooth muscles: smooth muscles are highly vascular muscles —they require a significant volume of blood and oxygen and during a threatening instance, the body has to be able to receive and mobilize as much resources as it can. The relaxation of the smooth muscles can be equivalent to a larger surplus of oxygenated blood. That surplus would be sent to the lungs and to the major muscle groups where they could be of more use.

- Other organ systems that are not so relevant with fighting the or fleeing

from the threat—some of the best examples of which are the digestive and immune system, temporarily shut down to allow more body resources to be sent for emergency and other urgent functions. This explains why a stressed individual suffers from immunosuppression syndrome. The individual's body becomes immunosuppressive because his body thinks that it has to activate its fight or flight response secondary to stress. In such a situation, all other normal body reactions during such a response takes place, including the temporary shut down or suppression of digestive and or immune functions.

Decision-making in a threatening situation

The decision or decisions that a person makes in the presence of a nearby threat to survival or any noxious or disturbing stimuli can come in many ways. Some individuals for example may prefer to run away and escape once they feel threatened but in the same manner, there can be individuals who would respond and resort to fighting especially when cornered. There are also some who seem to freeze and unable to react. Some people stand perfectly still in the presence of a threat. The important thing to remember here is that at some point, there will be variations when it comes to people's response to a threatening situation. There may be people who would react by fleeing and there may be ones who would react by fighting back. Also, the presence of a threat or a noxious stimulus may not always immediately lead a fight or flight response. Most of the time, heightened alertness levels and other improved abilities of the body which can be used for observation may also be the ones to get activated. Another factor that may contribute to the variations in an individual's decision making processes in a stressful or life-

threatening situation would be his gender. Males would normally respond to such situations aggressively or by fighting. Females on the other hand would normally respond by fleeing or by defusing the situation. This gender-based factor on the other hand can change in situations wherein the mother who is nursing her offspring gets threatened. The normal response, even if what we are talking about is a female, would be somewhat similar to that of a male. In most cases, the type and quality of decisions made during a threatening situation may also be influenced by an individual's emotional reactivity. Research suggests that the intensity of the emotion or reaction to a threat or a threatening situation has a direct correlation with an individual's emotional reactivity and or regulation. In general, individuals with a high level of emotional reactivity and low levels of emotional regulation would be more prone to exhibiting behaviors related to anxiety and aggression .

Creation of Fear

The presence of fear or being afraid of something is actually considered as a natural response of the body when one feels threatened or extremely disturbed. However, when the level of fear increases to an overly exaggerated level, it becomes a medical condition that is commonly referred to as a phobia. A person with a certain type of phobia fears things even if those things have nothing to do with his survival or is not threatening or scary at all. Phobia is the irrational form of fear. Fear can actually be compared to an image. Fear is an image that our brain creates. The creation of the image happens inside the brain and what is more surprising about this

is that it happens subconsciously. This is why some people do not know that they are afraid of something until they see it .

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