**1.3 Three Definitions**

Introduction

**Objective:** The objective of the first part of this assignment is to familiarize ourselves with the roles of definitions in professional writing, as well as catering the level of technicality of the definitions to the intended audiences.

**Criteria:** The criteria for the first part of the assignment is to define a relatively complex term within our disciplines in 3 forms: parenthetical, sentence, and expanded. These definitions have to take into account a chosen situation and a non-technical audience.

Term, Situation, and Audience

**Term:** Neuroplasticity

**Situation and Audience:** A student studying neuroplasticity to a group of people who have no prior background in neuroscience, human physiology, and any related sciences that utilize the term. The audience is assumed to know basic high-school level science (i.e. understand that neural means relating to the brain and nervous system).

Definitions

**Parenthetical:** The study of *neuroplasticity* (the brain’s ability to change its connections) may lead to possible therapies for memory loss at old age.

**Sentence:** Neuroplasticity is the brain’s ability to change its structure and connections in response to internal or external stimuli. It is characterized by the physical change of connections within the brain from one area to another to strengthen the processes of the brain or removing neural connections if you no longer need the skill or memory.

**Expanded:**

What is Neuroplasticity?

Neuroplasticity refers to the brain’s ability to change its structure and connections in response to stimuli, such as development from a young age, changes in one’s physical environment, learning new skills, physical and/or mental training, and injury of the brain or a body part. It is largely characterized by structural and functional changes in the brain’s *neurons* (nerve cells in the brain that receives and sends information to different brain regions). These changes can be either the strengthening of connections and speed of information transfer of neurons, if you experience new events or learn a new skill, or the removal of certain connections and reduction of speed of information transfer, if you do not engage in learning and practice of a certain thing. These changes can also be seen during development of a child to an adult as well as when there is injury to the brain or body parts (i.e. when one part of the brain is removed due to a brain tumor).

How did the term “Neuroplasticity” originate?

Neuroplasticity is derived from the words *neuro*, meaning relating to the nervous system (including the brain), and *plasticity*, meaning the ability of a structure to change as a result of external stimuli. Neuroplasticity is also termed brain plasticity or brain malleability.

How did the term “Neuroplasticity” develop?

People used to believe that the brain stopped developing after childhood. In the mid-20th century, multiple researchers demonstrated evidence that the brain still undergoes changes in adulthood, as a result of engaging in new experiences, which was when the term Neuroplasticity became popularized.

What are the mechanisms of Neuroplasticity?

Neuroplasticity can come in the form of strengthening the brain’s nerve connections or weakening these connections. Any change to the brain (good or bad) can be characterized as neuroplasticity.

**Strengthening** the brain’s nerve connections happens through undergoing new experiences, such as learning a new skill, practicing a skill, or any other stimulation to the brain. In the brain, this can be characterized as nerves forming new branches to strengthen its connection to other nerves or brain regions or these nerves making new connections, which happens every time you practice that skill or experience the same thing. So, the more something is experienced, neuroplasticity will occur in the form of strengthening the connections in the brain.

**Weakening** the brain’s nerve connections happens through injury to the brain or other body parts or the lack of practice or experience in a skill or other activity. In the brain, this is seen as the removal of these nerve connections that are stimulated when the particular experience occurs or the decrease of nerve branches.

What are some examples of Neuroplasticity?

**Learning how to play the piano** leads to neuroplasticity. When you continuously practice the piano, your brain is changing by strengthening the nerve connections between your hand and your ears. For instance, when you press a note and hear a sound that you expected, this will register in your brain and the nerve connections that make this happen will strengthen.

**Stopping your regular piano practice** also leads to neuroplasticity. When you have been practicing the piano, you have these strong connections. But when you stop playing regularly, you start to forget how to play or “get rusty”. This is because the connections in your brain that connect what you hear to the movements of your finger are being removed, due to the lack of practice and stimulation of the brain in this capacity.

**References**

William, M. (2017, January 24). *Definition of Neuroplasticity*. Retrieved September 29, from https://www.medicinenet.com/script/main/art.asp?articlekey=40362

Neuroplasticity. (2020, August 17). *Physiopedia*. Retrieved September 29, 2020 from [https://www.physio-pedia.com/index.php?title=Neuroplasticity&oldid=246064](https://www.physio-pedia.com/index.php?title=Neuroplasticity&oldid=246064" \t "_blank).

Hoiland, E. (n.d.). *Brain Plasticity: What is it?.* Neuroscience for Kids. Retrieved September 29, 2020 from https://faculty.washington.edu/chudler/plast.html