

Q4)

Describe the use of one technique used to study the brain in relation to behavior.

One technique used to study the brain in relation to behaviour is the fMRI machine. It is neuroimaging technique used to study brain function. fMRI measures the change in blood flow and as there is an increase, it can be detected where the function is occurring in the brain. The technique is non-invasive as the individual lies on the bed which slides into a tube-like machine. Powerful magnets are present in the machine that create a strong magnetic field around the patient or participant. The protons in the brain align themselves in a particular direction. Radio waves are sent through the brain which causes the protons to emit signals that are picked up by sensors in the machine. The data is collected and converted into proper images of the neural activity in the brain which shows the change in blood flow. This resonance imaging technique is a correlation technique i.e. it does not establish any cause and effect relationship. fMRI is mostly used to study cognitive processes, such as perception, attention, memory and decision-making. Although, it is extremely useful, it is important to note that it has a low temporal resolution. Temporal resolution is the smallest time period of a function that lasts for 1 second. This implies that fMRI is limited to functions like memory, face recognition and choosing among alternatives, lasting for several functions. However, it has a high spatial resolution. Even though it is noisy during scanning the brain which could be distracting to the individual, fMRI is tremendously useful in psychology and neuroscience. Hence, the fMRI studies brain function by measuring the

the increase in blood flow. ~~White~~ ^{And} researches see on the computer projection on the computer, detecting which brain area is activated during whatever neural activity or cognitive behaviour occurs. Another benefit of the fMRI machine is that, it can be devised which neural processes are connected. As if one area of the brain has an increase in blood flow but also another area, we establish that some ~~parts~~ processes are interconnected. A few other neuroimaging scanners are CAT, MRI and PET.

One study ~~use~~ that demonstrates the use of fMRI is the Fisher, Aron and Brown, 2005 study. It investigated the effect of the presence of a beloved on the brain. Participants included young women in love, of ages between 18-26. They were put in a fMRI scanner and given images of their beloved. Then a picture of an acquaintance and asked to count backwards. This was repeated six times to get clear images of the neural ~~at~~ activity. Results showed an increase in blood flow when the picture of ~~these~~ participants' beloved was shown. This means that an increase in mood of women was detected. And the study displays the use of fMRI to study brain functions. However, the study was gender bias as it only included women, and had a high ecological validity and demand characteristics or participant bias can be eliminated since an increase in blood cannot be controlled by any of the participants.

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There are many techniques used to study the brain in relation to behavior. One of these techniques is the magnetic resonance imaging (MRI) technique. In order to do the MRI brain scan, people must lie in a narrow tube-like machine for approximately 40 minutes. This technique works on the theory of atomic nuclei and is known to show high quality or detailed ~~image~~ image of the brain scan. The scan is also known to be especially good with soft tissues, such as the brain. Another strength for this technique is that people having the MRI scan are not exposed to radiation. Changes in behavior or brain function can be demonstrated by comparing before and after MRI brain scans or by comparing the brain scans of one particular group population with another. With that being said, there are still some limitations to using the MRI technique. For example, the technique ^{can be} too expensive as those who have metal implants can not do MRI brain scans due to potential health complications or risks. Other groups of people, such as children or those who are claustrophobic, also can not have an MRI brain scan due for similar reasons.

In the Maguire et al (2000) study, an MRI brain scan

In the hippocampus for a specific brain function - spatial memory.

The experimenter group consists of 16 right-handed licensed ^{male} London

taxi drivers, while the control group consists of 50 healthy right-

handed male participants. The MRI brain scan demonstrated

the differences in the volume of grey matter in certain areas

of the hippocampus. Results show that the taxi drivers have a

higher volume of grey matter in the posterior hippocampus

compared to the control, while the control had greater volume

of grey matter in the anterior hippocampus. Since the MRI later showed

that the general ^{volume of} grey matter between the groups are about the

same, this suggests that there ~~is~~ is a shift in ~~the~~ ^{the}

~~the~~ ~~volume of~~ volume of grey matter. The MRI ~~scan~~ brain scan

is a good tool for comparing the different groups, and

since these men are not children, ~~this~~ this limitation in

the technique does not apply to them.