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Impact based on quarantine psychology: analysis of left and right brain hemispheres

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ABSTRACT

Brain, the most powerful object in the universe, consumes only a few watts of energy. To replicate it, a nuclear power plant will be necessary, and this powerhouse is the sole controller of the human body. Normally, the brain is divided into two parts, with the left and right hemispheres working independently. The right half of the brain tends to cause mental tension and anxiety, exacerbating the present physiological condition like the current COVID-19 outbreak. A survey was done in the Durg district of Chhattisgarh, which is one of the hardest hit epicenters of the COVID-19 second wave in India. According to this survey, the majority of women of all ages are right brained, meaning their right hemisphere predominates over their left. They are more likely to suffer from mental illnesses than men because they are more inventive and creative thinkers. To avoid this circumstance, stress-relieving activities have been developed.

Keywords: mental health; machine learning; modern imaging techniques; psychogenic fever; left/right hemisphere
1. INTRODUCTION

This survey revealed the prominence of the right brain among humans in situations of despair. The COVID-19 pandemic is a significant threat to humanity. The pandemic is putting excessive pressure on our healthcare and economic systems. Further COVID-19 threatens social connections among humans. Typically, there are two lateral halves of the brain: left hemisphere and right hemisphere, working distinctly. It cannot be obscured that both the hemispheres work together to function as a brain but it is scientifically proven fact that each hemisphere has unique functions to be performed.

Out of the two cerebral hemispheres, the dominance of the right hemisphere can be correlated to mental disturbance. People with a right-dominant brain are believed to be more creative, emotional, and intuitive. The general sense of space is dealt by the right hemisphere, whereas the objects in specific locations are dealt by the left hemisphere. Right hemisphere allows to organize data sufficiently in a mono semantic way and it replaces the reality that exists with factitious information. However, the right hemisphere was more specialized for perception. Some were dubious, about the correlative and symbiotic nature of the two sides of the brain in maintaining psychological equilibrium (Don, 2020).

Importantly, individuals who are characterized by a creative brain-style could experience harsh effects due to COVID-19. More importantly a person who thinks more deeply ahead of the real world phases threat to their mental and physical health. Some experimental clues lead to the fact that creative thinking is associated with nature to focus on health problems. For example, it is found that individuals with an imaginative thought style are more likely to incur health issues into their own memory, and this intensifies their sense of unguarded existence to illness and anxiety (Williams, 2017). Therefore, individuals with an abstract brain style experience a greater need for social interaction however supporting social friction and negative views from others.

The main purpose of this paper is to discuss the relationship between mental issues and hemispheres of the brain. In current scenarios there are multiple tests and online resources which help in determining dominance of one’s brain. However, no such relationship has been drawn between the dominance and cure of mental issues. Generally mental wellness is always linked with a social stigma which prohibits people from exploring the possible cure. Until a person discovers him/her to be suffering from severe mental illness and no steps are taken in the initial level leading to higher degree of deterioration.

Even though the threat to human interaction is virtually universal, the specific mechanisms by which COVID-19 affects our mental wellbeing are versatile and
modifiable across individuals. To support this effort, we advance hypotheses on how personalized brain profiles act in different hemispheres of the brain. The functionalities of brain are shown in Figure 1. The research on hemispheres of the brain could enhance the examination related to these topics. People all over the world are gradually being encouraged or forced to stay at homes, separated from friends, family, and coworkers; except for essential activities. While these techniques are currently necessary to mollify the effects from public health view, this level of quarantine is inconsistent for human behavior (Corballis, 2014; Don, 2020).

Some instances which explain these situations are exhaustion, detachment from others, worry while dealing with febrile patients, irritability, insomnia, poor focus and indecisiveness, declining job performance, and reluctance to work or consideration of resigning were all significantly higher among confined employees.

During quarantine, having insufficient basic resources (such as food, water, clothing, or lodging) was a source of aggravation. On the other hand, school and college going children’s exposure to screens suddenly increased which gave birth to stress, fatigue, headache, shoulder pain and many such problems with their root cause being the anxiety caused by quarantine. Moreover, these all outcomes affected human psychology the most. For instance, fear, isolation, loneliness, and insomnia are some of the emotional reactions to social isolation, with boredom being the biggest emotional deterrent to quarantine compliance. Housing conditions, for example, were linked to depression symptoms, such as compact apartments with limited visitors and interior features.

Figure 1. Functionalities of the brain, when split
1.1 Related works

In the sixties, initial observations exploded into the scientific literature and within the public sphere once some spectacular and shuddery experiments were performed (Calvin, 1997). It absolutely was throughout this decade that researchers were experimenting to search out ways to treat severe brain disease.

There was a category of patients whose seizures could not be treated by psychotherapy or psychotherapeutic drugs. These people would have frequent and exhausting and weakening seizures which were no way to live. Thus, Gazzaniga (1967), Sperry (1961, 2021) and other scientists explored further treatments.

One treatment was to sever a part of the brain that connected the right and left hemispheres. These studies are referred to as "Split-Brain Experiments". The tract is an element of the body that connects the two sides of a healthy brain.

In these surgeries, surgeons merely cut the tract (The hemispheres communicate with one another through a thick band of 200-250 million nerve fibers), turning the brain that was once single in operation basically into two separate ones. The complete prospect could have given others the sneaks, however the surgeons had some success in treating brain disorder, then some surgeries were performed (Gazzaniga, 1967). It was from these studies that scientists became conscious of a number of the regional variations of gifts within the functioning of the brain.

Figure 2. Woman and man's face
Figure 2 depicts a combination of female and male on either side. As it can be seen that Figure 2 consists of the dot on the forehead therefore when a patient focus on the middle dot, the information of the female's face will go to the right hemisphere and male's face will go to the left hemisphere. When a patient with a split brain is instructed to point to the picture of faces depicted, the patient will give information which went to his or her right hemisphere which is generally female. Now, if the patient is asked to tell whether the picture was a male or a female, then he or she would say that it was of a man. Hence, depending on what the patient is needed to try and do, either the right or left hemisphere can dominate. According to prior research, it can be found that brain consists of two hemispheres: the left brain and the right brain.

Now relating to the existing psychological studies with Artificial Intelligence, Machine Learning techniques and collecting data sets from various psychological tests of various age groups, it is being observed that with time, the brain dominance of a human being changes from left dominance to right or vice-versa. Researchers have shown that young women suffering from higher levels of anxiety or depression are likely to be exposed to psychogenic fever: there are patients whose high temperature is associated with psychological stress for those who experience episodic or chronic high core body temperature without any inflammatory triggers (Oka, 2015).

2. METHODS

Firstly, a study of vivid research papers and surgeries were conducted on brain hemispheres originating from the 1960’s till date (Hagerty et al., 2020; Nielsen et al. 2013; Sperry, 1967, 1975; Vadim, 2004). The study is analyzed based on criteria mentioned in Table 1. Data was collected through Google form during the 2nd wave of COVID-19 from various aspects:

- Occupations
- Gender
- Age
- Brain dominance
- Color of the shoe
- Color of the dress
Table 1. Data categorization into variables

| Variables         | 10-25 | 26-40 | 40 above |
|-------------------|-------|-------|----------|
| Age               |       |       |          |
| Gender            | Male  | Female|          |
| Brain Dominance   | Left brain > Right brain | Right brain > Left brain | Left brain = Right brain |

The excel sheet obtained from Google form is converted to CSV (Comma Separated Values) file format. Then variables mentioned above are normalized accordingly for exploratory data analysis. Further, various graphs are plotted with respect to the variables declared which are Dendrogram [Figure 3], Line graphs [Figures 4, 5], 3-D scatter plot [Figure 6] and Bar graph [Figure 7]. Analysis was drawn through the produced graphs, creating relationships among the variables.

3. RESULTS

The result says that out of one thousand people, 500 were female and 500 male. Out of 500 females, 200 females were found to be right brained and remaining were either 50% or left brained whereas among 500 males, only 100 were found to be right brained (Table 2).

Taking the equal number of men and women from the dataset, acquired from the survey conducted during the pandemic situation (Lockdown period), some conclusions have been drawn. Using the dataset, the dendrogram plot [Figure 3] represents that among the dominant right brained people, Number of females is more than male. This outcome shows that a female is more likely to get depressed or suffer from a mental illness than a male. Since the dominance of the right hemisphere increases the vulnerability towards mental issues.
Table 2. Gender categorization (right)

| Brain / Gender | Male (500) | Female(500) |
|----------------|------------|-------------|
| Right > Left   | 100        | 200         |
| Left > Right   | 330        | 140         |
| 50% each       | 70         | 160         |

Figure 3. Dendogram

Figure 4. Line graph for depression rate
According to this line graph (India for past 12 months), the Depression rate of female (red) is always either equal to or greater than male (blue). The graphs plotted [Figure 4] support the fact that females are prone to depression at a higher rate and are mostly right brained as compared to male. Being a dominant right brainer causes a person to be more creative and imaginative.

![Figure 5. Line graph for shoe colors identified by female and male](image)

On analyzing the dataset of people identifying the color of a shoe, the graph [Figure 5] shows that female identify multiple color schemes as compared to male. Male could see the shoe as green and gray only, whereas female could see other possible combinations (right y axis).
This 3D scatter plot (Figure 6) derived from the data set compares three dimensions: Gender (x axis), Color of dress (y axis) and Age (z axis). It represents that females identify more color patterns as compared to male that lie in the age group of 10 to 50.
This bar chart (Figure 7) represents the dominance of brain (y axis) with respect to gender and serializes the data for the age group of 10 to 25. Here also, it can be inferred that right brained and 50% equal dominance is on a large extent represented by females. However, men are left brain dominating.

4. CONCLUSION AND SIGNIFICANCE

Working on this research, a dynamic classifier is built. On determining the dominance of the right hemisphere, the classifier will help in creating awareness among the viewers regarding the scientific reasons behind such differences. The classifier will suggest interesting games, activities, real time updates accordingly and generate information which explains the phenomenon of brain dominance and consequences, whether it may be left or equal dominance. This will help in dealing with the stressful situation of COVID-19 furthermore accompanied with regular medications and physical exercise. However, it should be kept in mind that Chiron et al. (1997) claim that right brain dominance enables children at the age of 3 or 4. On the contrary, left brain features activate when children are about 7 years old and solely right brain is not the only contributor towards mental illness, it requires various other aspects:

- Determining the current status (COVID-19) of one’s mind in the early stages will increase the chances of a person avoiding harsh mental issues;
- Discussing such critical matters on a global level helps in reducing the social stigma associated with the mental ailments thus leading to a much worse situation;
- Before cure, the reaction and dealing towards any problem marks a large significance hence, thinking of a mental illness not more than any physical one must be the first step towards a great challenge;
- Especially observing the age group of 10-25 which covers (40-50%) of the population in India needs more attention peculiarly during COVID-19 pandemic, therefore a new platform which educates as well as gives opportunity to amend the differences will be of great help;
- Discussing lateralization on such a platform will greatly enhance our appreciation towards different aspects and its effects.
Impact based on quarantine psychology

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Conflict of interests

The authors declare that they have no conflict of interest.

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