

TMS TRENDS

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BRAIN COMPOSITION DIFFERENT IN EMOTIONAL VS. RATIONAL PEOPLE

According to a recent study published in *NeuroImage*, there are physical differences in the brains of people who respond emotionally to others' feelings, compared to those who respond more rationally. The study looked at whether people who have more brain cells in certain areas of the brain are better at different types of empathy. The two different types are affective empathy and cognitive empathy. Those who are high on affective empathy are individuals who may experience fear when watching a scary movie or sadness during a sad scene and those who have high cognitive empathy are those who are more rational, such as a clinical psychologist.

The researchers used voxel-based morphometry (VBM) to examine the extent to which grey matter density predicted their scores on tests that rated their levels of cognitive empathy compared to affective empathy. The results illustrate that people with high scores for affective empathy had greater grey matter density in the insula, while those who scored higher for cognitive empathy had greater density in the midcingulate cortex. These findings show that affective and cognitive empathy are represented in different brain structures as well as different neural networks. These findings raise questions about whether some kinds of empathy could be increased through training or whether people can lose their capacity for empathy if they don't use it enough. Future studies may investigate causation by testing whether training people on empathy related tasks can lead to changes in these brain structures and also whether damage to these brain areas can lead to empathy impairments.



**Happy 4th of July from the
TMS Institute of Pennsylvania!**

BIOMARKER HELPS IDENTIFY MENTAL ILLNESS IN WOMEN

Psychiatric disorders can be difficult to diagnose as clinicians must rely upon interpreted clues. The indications of mental illness often include a patient's behavior and feelings. Identification of a mental illness by matching behaviors to genetic predispositions could facilitate a timely diagnosis, and aid intervention and research. Researchers at the University of California, San Diego School of Medicine report that for the first time, they have identified a biological marker: the over-production of specific genes that could be a diagnostic indicator of mental illness in female psychiatric patients. The study, published in the journal *EBioMedicine*, reports the discovery of the gene XIST— which is responsible for inactivating one of the two copies of the X chromosome in cells that store genetic material— that works overtime in female patients with some forms of mental illnesses. Investigators found that the illnesses include bipolar disorder, major depression, and schizophrenia. The study suggests that over-production of XIST and genes from the inactive X chromosome are common denominators in the development of psychiatric disorders in patients with rare chromosome disorders, such as Klinefelter syndrome and Triple X syndrome, and in the general population of female psychiatric patients. The results indicate that a large subpopulation of female psychiatric patients from the general population may have abnormal function of the inactive X chromosome. The researchers state that their results are powerful as early diagnosis of mental illness could possibly happen with a simple blood test, which could lead to better interventions, therapy, and treatment options.