

# Scientists link emotional processing deficits with white matter damage

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Kessler Foundation researchers have linked the inability to recognize facial affect (emotion) with white matter damage after traumatic brain injury (TBI), an important first step toward understanding this emotional processing deficit. Their findings indicate a pattern of white matter damage and gray matter atrophy associated with this specific impairment of social cognition after TBI. The article, "Facial affect recognition linked to damage in specific white matter tracts in traumatic brain injury," was published in *Social Neuroscience*.

Individuals with [brain injury](#) experience deficits in emotional processing and [social cognition](#), most notably the inability to recognize emotions expressed by facial features. Little is known about the underlying mechanisms of this deficit in facial affect recognition, which may contribute to social dysfunction. Understanding the cause of these deficits, as well as their manifestations, will support the development of effective interventions.

In this study, 42 people with moderate to severe TBI were compared with 23 controls for their ability to identify six emotions—happiness, sadness, anger, surprise, fear, and shame—when shown facial photographs (Facial Emotion Identification Test [FEIT]). Their responses on these facial affect recognition tasks were correlated with neuroimaging changes on diffusion tensor imaging (DTI), which shows the integrity of white matter tracts in the brain.

Performance on FEIT was worse in the TBI group compared with

controls. In the TBI group, poor performance on FEIT was associated with lower values for [white matter](#) integrity and volume of gray matter as seen on DTI. "Recent studies have shown that there are impairments in the ability to recognize facial affect after TBI," said Dr. Genova, senior research scientist in Neuropsychology & Neuroscience Research at Kessler Foundation. "Using neuroimaging, we found that changes in white and [gray matter](#) contributed to failure to accurately identify the emotions expressed in the facial photographs in FEIT. This deficit may adversely affect relationships, hindering social functioning in the home, the community and the workplace. To address this problem, more research needs to focus on deficits in emotional processing, their impact on social functioning, and the added dimension of objective findings on neuroimaging."

**More information:** "Facial affect recognition linked to damage in specific white matter tracts in traumatic brain injury," *Social Neuroscience* 2015;10(1):27-34,  
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