- Stress / Empathy overload

Is depression contagious? New study reveals how empathy can cause us to feel others' pain — and soothe it

Researchers have found some surprising signs that depressive symptoms could be passed on — but that social bonds are also key to reducing them, writes John Mac Ghlionn

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Mirror neurons allow us to 'feel' what others feel by turning observations into internal emotional experiences

The holidays are over, the days are short, and the cold keeps everyone indoors. It's January, the month that feels like an endless Monday. It's no surprise that January is often seen as the most depressing time of the year. What's more surprising is that depression, once thought to be purely personal, may actually spread between people like an emotional contagion.

In a recent, rather fascinating study, researchers tested this idea using mice to uncover how depressive behaviours could be "transmitted" and whether stress alone was enough to explain the phenomenon.

Chronic stress

The researchers created three experimental setups to understand this emotional spread. First, they subjected mice to a method called chronic unpredictable mild stress (CUMS), exposing them to mild but persistent discomforts like disrupted light cycles, cage tilting, and brief cold swims.

These stressors reliably caused behaviours associated with depression, such as losing interest in sweetened water – normally a treat for mice – and showing more signs of despair in a test where they were suspended by their tails.

Once these depressive behaviours were established, the researchers tested whether healthy mice could "catch" them simply by living alongside the affected mice.

The results were striking. Healthy mice housed with depressed mice over several weeks began to show similar depressive behaviours, such as reduced interest in sugary water and increased signs of despair.

Surprisingly, this wasn't the case when healthy mice lived with "stressed" mice – those undergoing CUMS but without developing full depressive symptoms. Stress alone did not spread.

To probe more deeply, the researchers tested whether non-physical contact could trigger similar effects. Depressed and healthy mice were housed in the same cage but separated by a clear barrier, allowing visual and auditory exposure but no physical interaction.

Under these conditions, healthy mice showed no signs of depressive behaviours, reinforcing the idea that something beyond mere observation drives the spread of depression.

Even more intriguingly, when bedding from depressed mice was placed in cages with healthy mice, it was enough to trigger depressive behaviours, though stress hormone levels remained unchanged.

This indicated that substances in the environment, such as odours or chemical signals, might play a key role in transmitting depressive states. Unlike traditional triggers that activate stress hormones, depression contagion appears to bypass this pathway.

Amid these findings, the researchers also discovered a hopeful counterbalance: the role of healthy relationships. When stressed mice cohabited with healthy mice, their depressive symptoms were noticeably reduced. This effect, known as social buffering, suggests that positive social interactions can offer some protection against the spread of depression. Remarkably, even in non-contact setups where depressed mice were separated by a barrier, signs of depressive behaviours lessened over time.

It's important to note that mice are commonly used in lab studies because their internal biology is very similar to humans, making them valuable models for understanding human diseases and testing treatments. Mice share a high percentage of genetic similarity with humans – around 85pc, which means they can experience similar health conditions like cancer, diabetes, and neurological diseases. Their organs and systems, such as the heart, liver, and immune system, function in ways that closely resemble those in humans.

But, of course, mice are not humans, and there are significant differences between the two species that researchers must consider. Mice don't experience the same environmental pressures, social factors, or psychological influences that shape human health. They don't deal with traffic jams, credit card debt, or filing taxes.

However, much like mice, depression seems to spread among humans too. In 2022, researchers in Brazil investigated this phenomenon, showing that depressive states can "infect" others much like emotions do. They found that mechanisms like automatic mimicry and the brain's mirror neuron system (MNS) play a key role. By reviewing behavioural, physiological, and neurological evidence, they revealed how depression transmits in social settings.

The study expanded on the idea of emotional contagion – the way emotions like joy, sadness, or stress can ripple through social interactions. This phenomenon is especially common among people with close relationships, such as friends, partners, and family members. The researchers took this concept further, arguing that depression, a more complex emotional state, can spread in much the same way. They found that college roommates of depressed students began showing depressive symptoms themselves after three weeks of living together.

Unconscious imitation

At the heart of this contagion is automatic mimicry, the unconscious imitation of others' expressions, gestures, and behaviours. This subtle mirroring syncs emotions between people. If someone around us radiates sadness or hopelessness, for example, we may unknowingly adopt their demeanour, pulling our mood down with theirs. Paired with our natural capacity for empathy, this mimicry helps explain how depression can take root and spread through social circles.

The mirror neuron system (MNS), a network of brain cells that activates when we observe and mimic others' emotions, plays a critical role in this process. Mirror neurons allow us to "feel" what others feel by turning observations into internal emotional experiences.

Brain imaging studies, like those using fMRI, show that individuals with depression often have disrupted activation in MNS-related areas. This impaired neural activity may explain why depressed individuals struggle to process and regulate emotions effectively.

The researchers also traced the evolutionary roots of emotional contagion. In early human societies, sharing emotions – even negative ones like fear or sadness – likely served as a survival tool, fostering group cohesion and communication in times of danger.

But in modern life, this once-useful instinct can backfire. When surrounded by others in a constant state of despair, depression can spread unchecked, especially in the absence of healthy support systems or coping strategies.

Fortunately, positive social interactions have the power to disrupt the vicious cycle. Close connections with supportive friends, family members, or partners can act as emotional "shock absorbers," helping individuals process negative feelings before they take hold.