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Undergraduate



Emotional Contagion: How We Mimic the Emotions of Those Similar to Us

BY ZOE FRANKLIN

All around you exists an emotional ecosystem. As you buy your coffee in the morning, the barista thinks about their date last night and as their pupils dilate, yours dilate in response. As you wait to cross the street, the person next to you taps their fingers anxiously and your heart rate increases. Whether you realize it or not, you are continuously being influenced by and influencing the emotional climate surrounding you.

Human beings are experts at an incredible skill we often take for granted: understanding people's mental states. We are able to read and interpret the slightest changes in tone and body language. One essential part of this interpretation process is our unconscious urge to mimic others. We watch someone trip, and we wince as they hit the floor. Someone laughs at a

joke out of earshot, and a smile tugs at the corners of our lips. While these instances can seem mundane, they highlight the fact that what we view as "me" often extends beyond our own bodies. Every day we experience these mysterious moments when the boundary between ourselves and others becomes blurred for just a moment.

Researchers call this spillover "emotional contagion." Emotional contagion is seen as a primitive and automatic form of empathy that may be the foundation for more sophisticated forms of cognitive perspective taking. How, then, do we "catch" another person's emotions?

A well-known player in emotional contagion is our mirror neuron system (MNS) (Fig. 1). Vilayanur Ramachandran explains that when we watch someone experience an action, like being touched, a subset of our

neurons responds as though we too feel that action.¹ Feedback signals, however, prevent us from feeling any sensation. But without feedback signals, activating these mirror neurons can create the illusion that we are having someone else's experience. Ramachandran calls these "Gandhi neurons" as they "dissolve the barrier between you and other human beings."¹

However, the MNS is more complex than simple mimicry. When faced with the same emotional stimuli, why do some people get angry and others get scared? As we gather emotional information from the external world, the MNS helps simulate and create predictions about the world, allowing us to choose from a repertoire of default emotional responses.^{2,3} This process begins by simulating others' emotions through shared neural activation and a synchronization of bodily systems (Fig. 2). We can then select an appropriate emotional response and transfer emotional meaning from one person to another.⁴

According to this model, emotional contagion is created from a combination of autonomic and motor mimicry. The synchronization of our autonomic systems such as pupil dilation, blushing, and sweating is involved in simulating the arousal

"But without feedback signals, activating these mirror neurons can create the illusion that we are having someone else's experience. Ramachandran calls these neurons 'Gandhi neurons' as they 'dissolve the barrier between you and other human beings.'"

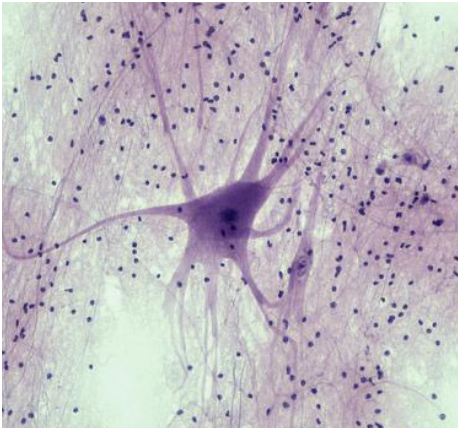


Figure 1: Magnification of a spinal cord motor neuron.

level: how *much* of an emotion you may feel, while mimicking others’ motor responses such as smiling or frowning is involved in labeling the valence: *what* this emotion may be.⁴ A combination of autonomic and motor simulation therefore allows for a nuanced understanding of the socioemotional world around us (Fig. 3).

SIMILARITY

Like catching a cold, we can catch others’ positive and negative emotions, but there’s one caveat. Researchers are finding evidence that we may be more severely “infected” by people we view as similar to ourselves.

What may be the neural basis for viewing others as similar to ourselves? Two ar-

reas of the brain involved are the dorsal and ventral medial prefrontal cortex, which are associated with the processing of social stimuli. Studies have found both similar and differential activation of these areas when processing self-related versus other-related content.⁵ These differences may be driven by the “degree of self-relatedness of the other person.”⁶ Thinking about similar others may in fact be a different type of *self*-reflection, as we simulate their experience through self-projection, cognitively putting ourselves in their shoes.

One simple aspect of being similar is physical similarity. A 2009 study by Xu, Zuo, Wang, and Han found that the perception of another’s race changed how people responded to that person’s pain.⁷ They scanned the brains of both Caucasian and Chinese participants as they were watching videos of individuals being poked by a needle and were asked to rate how much pain the model felt. When individuals watched videos of racially similar models, activity in the anterior cingulate cortex and insula—regions of the brain involved in creating our personal experience of pain—increased to a greater extent than when they watched videos of those in their racial outgroup.

Similarity is not limited to visual appearances. In Mitchell et al., participants read descriptions of individuals who had either liberal or conservative political beliefs and were asked to imagine these individuals as well as their own personal political beliefs.⁸ Imagining others with shared beliefs more strongly activated a region of

the brain associated with self-processing compared to those with opposing political beliefs. This similarity in neural activation also extends to our personal subjective experience.

Our perception of being touched actually increases when viewing images of those of a similar ethnic or political group being touched.⁹

However, defining similarity is complicated. Each individual is a complex combination of traits, creating a constellation of similarities and differences between any two people. What determines whether an individual will simulate the experience of another? Some theorize that we ultimately search for information about shared beliefs but in the absence of semantic knowledge will use physical similarities as a proxy. Others emphasize the evolutionary role of racial membership in modulating empathy.^{8,10}

As with many questions in social neuroscience, the answer is: it’s complicated. As human beings, our innate urge to mimic others’ emotional states gives us an incredible ability to understand and share experiences with others. However, in an age of rapid globalization, it is important to consider the extent to which our experience of empathy depends on how we define our ingroups and outgroups. Can we expand our ingroup to view ourselves as “global citizens,” or is our emotional wiring set up in such a way that empathy may require some form of exclusion? Most importantly, how much control we have over this pro-

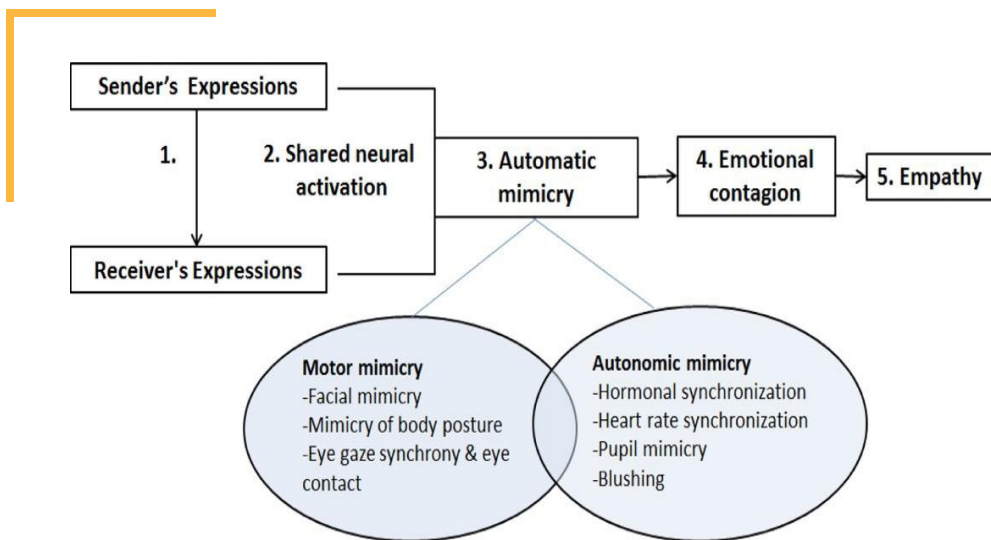


Figure 2: Schematic representation of empathy development. Reading the sender’s expressions leads to shared neural activation, automatic mimicry, and emotional contagion resulting in empathy.⁴

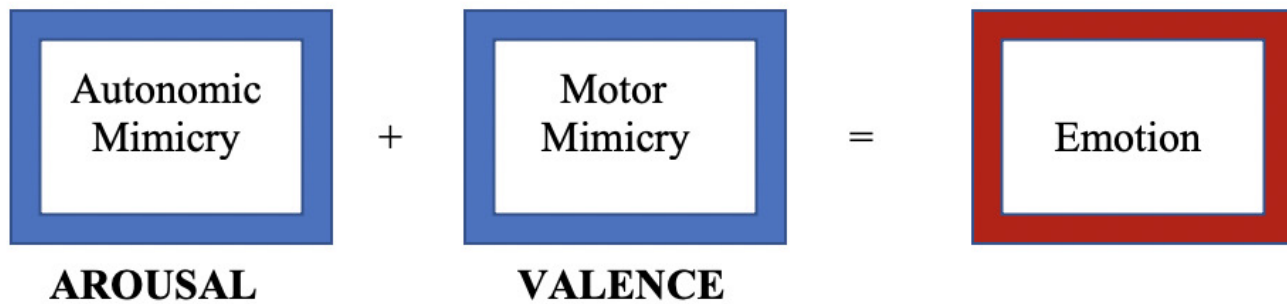


Figure 3: An emotion is a combination of its arousal level and valence. The arousal level is predicted by the autonomic mimicry pathway and the valence is predicted by the motor mimicry pathway.

“Thinking about similar others may in fact be a different type of self-reflection.”

cess? Regardless of how we answer these questions, there is no doubt that we live in a deeply connected world. However, how that connection is determined may depend on how we choose to draw the lines between ourselves and others.

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IMAGE REFERENCES

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