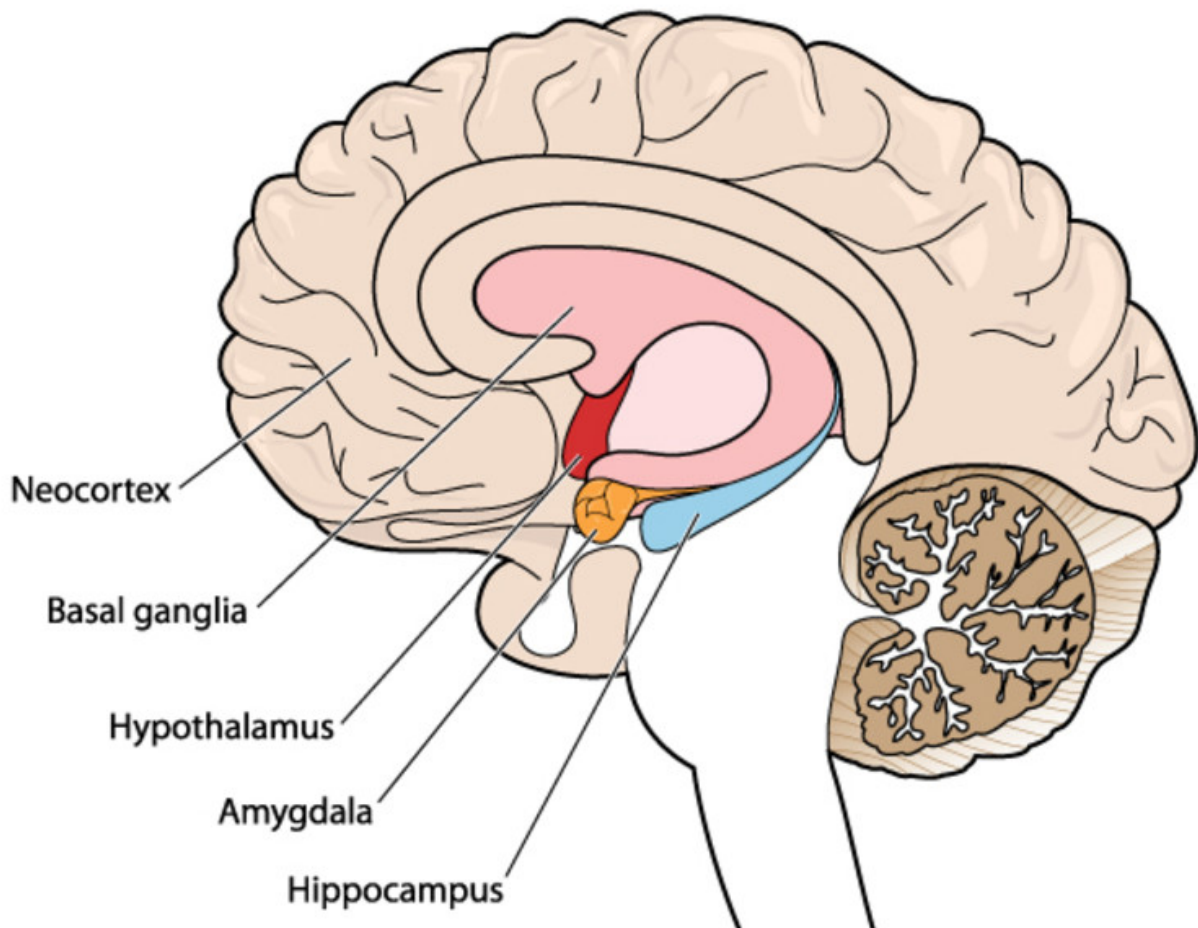# Medical Xpress

How just one little metaphor can fire up our emotions

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The all-important amygdala. Credit: Blamb

There's never been a US presidential candidate quite like Donald Trump – and one of his most distinctive traits is the way he uses vivid, jumbled metaphors. His speaking style is shot through with figurative imagery – a sort of language that we know is particularly effective at rousing people's feelings.

Indeed, fluency in metaphor and imagery is a good measure of how effective a politican's speech is. Take as an example Trump and Hillary Clinton's first televised debate. After Clinton's very [straight-up and literal opening speech](#), Trump was on his usual manipulative form, tossing out a range of emotive expressions: "our jobs are fleeing the country", "there is nobody in our government to fight them", "they are using our country as a piggy bank to rebuild China".

But he seemed to lose his temper when Clinton, confident and smiling, quickly rebutted him by mentioning "trickle-down economics" and decrying his plans as "Trumped-up trickle-down".

Losing his cool in the face of a mocking little metaphor, Trump slipped into a much more literal style that bogged him down for the rest of the debate. Clinton, meanwhile, kept her cool in the face of his every attack. And tellingly, she began to speak [more and more figuratively](#) as their exchange wore on, condemning Bush-era policies that "slashed taxes on the wealthy" who "took their eyes off Wall Street" and "created a perfect storm".

Many [reviews](#) of Clinton's turn at the debate duly lauded her confidence and credibility, while Trump was widely panned for losing control of his speech and failing to make coherent, persuasive arguments.

This all squares well with what we know about how language works on the brain. Keeping control over the way we says things allows us to choose our expressions more carefully, and to therefore be more

persuasive.

But why exactly is figurative language more powerful – and what feelings exactly does it stir in an audience? My colleagues and I have been looking into these questions, and the experiment we've run to try and answer them has shed a little light on what goes on in our brains when people talk to us this way.

Automatic responses

To observe these effects, we assembled some simple stories that contained either very common figurative expressions ("she had a rough day", "he slipped up") or literal versions of the same ones ("she had a bad day", "he made a mistake"), and asked volunteers to read them while we recorded their brain activity.

Our results showed that, while all the stories activated brain regions associated with emotional responses, the stories that used figurative expressions had much stronger effects on certain regions. In particular, they affected an almond-shaped structure called the amygdala, which typically responds to highly intense emotional experiences such as seeing a bear or riding a rollercoaster.

That this is where the figurative language hits home indicates that it elicits very automatic emotional responses when compared to literal language. There was more evidence of this in other brain regions, which were also more strongly activated by the more metaphor-heavy stories.

We saw activity in a prefrontal network at the very front of our brain, which is associated with executive functions – keeping two different ideas in mind at the same time, solving a puzzle, focusing on one task by ignoring other distractions, and so on. This network's stronger response to metaphor may indicate effort spent keeping both figurative and literal

meanings in mind at the same time.

We also saw activity in a "salience detection network", which includes parts of our brain that evolved further back in our development as a species. These areas react to threats or food – that is, emotionally or contextually salient stimuli.

Finally, we saw activity in an extended language network that includes large portions of the temporal cortex (the sides of our brain), the parietal cortex (the upper back part), and medial frontal regions (between the brain's two hemispheres). This network is associated with understanding meaning, integration and interpretation, and inference, as well as understanding the perspective and intentions of characters while reading stories.

Taken together, these results imply that stories which contain commonly used metaphors activate multiple meanings in the reader's mind, are perceived as more salient and pregnant with meaning than their literal versions, and require more interpretation and inferences to be understood.

On a gut level

You might think all this activity is simply what the brain needs to do to cope with linguistic sophistication – that a complex story demands more resources to be understood, hence the more extended brain activity and stronger emotional response. But we found that this isn't the case.

The metaphors in our stories were common expressions very familiar to the average native English-speaker. More complex stories activated the extended language network more strongly, but they didn't do anything more than the simple ones for the salience or executive functions networks.

Most crucially of all, the complexity of a story wasn't associated with amygdala activation; on the contrary, the more metaphorical the stories, the more the three brain networks and the left amygdala were activated.

So what do these findings mean? On the one hand, metaphors evoke more than one meaning – a literal one and a figurative, implied one – and our brain needs to evaluate both to decide which one is more appropriate in a given context. This operation may engage us more and trigger an affective response, much as solving a puzzle gives us a sense of pleasure and reward.

On the other hand, metaphors connect abstract concepts with more concrete ones: for example, a "bad day" can almost be perceived through touch if we talk about it as a "rough day", which sets off the simulated experience of touching a rough surface, for instance. The reader or listener is engaged on a bodily level, and therefore on an emotional level, too.

Neuroscientists have yet to fully test these two possible explanations and tease them apart. But what we know so far indicates that using figurative language doesn't just engage an audience intellectually; it automatically hits them on an emotional level, even if the metaphors the speaker uses are relatively familiar and basic.

As the two presidential candidates go down to the wire, both need to turn as many people out to the polls as possible. A little imagination injected into their language could do a lot to fire their people up. Trump, for one, seems to know this all too well.

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