

Why are you better at recognizing upright faces? Clues from a person who sees the world differently

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Credit: Brad Duchaine

When you see a familiar face upright, you'll recognize it right away. But if you saw that same face upside down, it's much harder to place. Now

researchers who've studied Claudio, a 42-year-old man whose head is rotated back almost 180 degrees such that it sits between his shoulder blades, suggest that the reason people are so good at processing upright faces has arisen through a combination of evolution and experience. The findings appear September 22 in the journal *iScience*.

"Nearly everyone has far more experience with upright faces and ancestors whose reproduction was influenced by their ability to process upright faces, so it's not easy to pull apart the influence of experience and evolved mechanisms tailored for upright faces in typical participants," says first author Brad Duchaine, a psychologist at Dartmouth College.

"However, because Claudio's head orientation is reversed to most faces that he has looked at, he provides an opportunity to examine what happens when the faces viewed most often have a different orientation than the viewer's face."

Researchers have long known from earlier studies that our ability to process faces drops or even plummets when a face is rotated 180 degrees. But it had been hard to determine if the reason for that comes from evolutionary mechanisms that shaped our brains' facial processing abilities gradually over time or simply because most of us primarily interact with people and see them with their face in an [upright position](#).

The question was: How does Claudio's altered viewpoint relative to the faces of others change how he is able to detect and match them up? Or does it? The answer, they realized, would offer clues about the nature of face perception in people more generally.

To find out, the researchers tested Claudio's face-detection and identity-matching ability in 2015 and 2019. They also tested his recognition of Thatcherized faces, in which some of the features, such as the eyes and

mouth, had been altered. Across all three types of tests, people with typical face perception are much better at these judgments when faces are upright than when they are inverted.

Their studies found that Claudio was more accurate than controls with inverted detection and Thatcher judgments but scored similarly to controls with face identity matching. The researchers say the findings suggest that our ability with upright faces arises from a combination of evolutionary mechanisms and experience.

"Because Claudio appears to have had more experience with upright faces than upside-down faces and he has viewed faces from an upside-down vantage point, it is revealing that he does not do better with upright faces than inverted faces for face detection and face identity matching," Duchaine said.

"The absence of an advantage for the face orientation that he's had more experience with suggests that our great sensitivity to upright faces results from both our greater experience with them and an evolved component that makes our visual system better tuned to upright faces than inverted faces."

Duchaine was surprised to get a different result when Claudio saw Thatcherized faces. In that case, Claudio performed better when those manipulated faces appeared upright. While the researchers say they don't why this happened, they suspect that the Thatcher effect arises from different visual mechanisms than facial detection and identity matching—and that those different mechanisms must have different developmental trajectories.

In future studies, the researchers want to learn more about this difference as well as other kinds of judgments people make when they see faces, including [facial expressions](#), age, sex, attractiveness, eye gaze

direction, trustworthiness, and more. Using measures of what's happening in Claudio's brain when he sees faces, they also want to "see whether his current face processing depends on typical mechanisms."

More information: Brad Duchaine, The development of upright face perception depends on evolved orientation-specific mechanisms and experience, *iScience* (2023). DOI: [10.1016/j.isci.2023.107763](https://doi.org/10.1016/j.isci.2023.107763). [www.cell.com/iscience/fulltext ... 2589-0042\(23\)01840-0](https://www.cell.com/iscience/fulltext/S2589-0042(23)01840-0)

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