

## Alien Friends

**For people with Capgras syndrome, loved ones have been taken over by body doubles. Their experience teaches us that feelings are integral to perception**

By Thomas Grüter and Ulrich Kraft

Nothing puts the horror into a horror film like an idyllic setting. That is how the 1956 science-fiction classic *Invasion of the Body Snatchers* begins. The inhabitants of the bucolic hamlet of Santa Mira, Calif., delight in their neighborly friendships and rarely have more than the most mundane concerns. But when town doctor Miles Bennell returns home after a short trip, he learns that one of his patients thinks her uncle is not really himself. The woman feels almost as if something evil is lurking behind his familiar face. Bennell is not too concerned. But then more and more patients become suspicious that a body double has replaced a spouse, relative or neighbor. Many of the doubles seem threatening, too. Bennell's sense of strangeness soon turns to awful certainty: alien invaders have chosen Santa Mira as the staging area for world domination. Under cover of night, they are taking over the bodies of their sleeping victims.

The insidious terror depicted in *Invasion of the Body Snatchers* exploits a primal human fear of total isolation: everyone we know becomes alien, leaving us utterly alone amid uncomprehending strangers who care nothing about our life or death. Moviegoers can escape this creepy world of doubles, but for people with Capgras syndrome, it is reality. Day in and day out, they firmly believe that certain people they know intimately have been replaced by robots, extraterrestrials or human doubles.

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***Many Capgras sufferers feel threatened by the supposed body doubles and, unfortunately, react accordingly.***

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Capgras syndrome is relatively rare, but the symptoms clearly demonstrate that our internal image of the external world is not a one-to-one mapping of the sights and sounds our eyes and ears take in. The brain processes and filters the flood of information at a variety of levels that we are unaware of. Only the end result adds up to consciousness as we know it, and for Capgras patients this reality looks a lot like the body snatchers film. Their eerie experiences show that perception consists not just of sensory inputs but also of feelings. The lesson of Capgras syndrome is that even our "normal" reality may be little more than a delusion.

### Eighty Husbands

The bizarre misperception of body doubles is named after French psychiatrist Jean Marie Joseph Capgras, who in 1923 with colleague Jean Reboul-Lachaux described the case of a Madame M. The woman insisted that identical-looking persons had taken the place of her family. Nothing could dislodge her belief. Over time her delusion expanded to neighbors, friends and acquaintances. But Madame M. never even got to know these impostors, because, she believed, they regularly moved out to make room for the next double. In the end, she claimed to have had more than 80 husbands.

The proper name for such a condition is Capgras delusion syndrome, with "delusion" implying an incorrect assessment of a correct perception. In contrast, a person who suffers hallucinations is experiencing perceptions that have no basis in reality. A delusion is a false belief, based on incorrect inferences about external reality, that is sustained despite what almost everyone else believes and regardless of obvious proof to the contrary.

Delusions take many forms. A schizophrenic woman may insist that a wilted piece of lettuce in a salad is proof that someone is out to poison her; an open window is a sure sign that her conversations are being monitored. Nothing can persuade her about the groundlessness of her theories. If a psychiatrist pushes countering views too hard, she will add him to her list of suspected enemies.

Luckily, many schizophrenic delusions turn out to be transient, but while they last the patient is unable to recognize them for what they are. These cases differ, however, from so-called monothematic delusions, such as Capgras syndrome, which focus on a single topic and are often considerably longer lived. Patients may first develop their delusions as a result of biological changes in the brain--perhaps caused by dementia, stroke, aneurysm or brain injury. Indeed, a metastudy published in November 2004 by Dominique Bourget and Laurie Whitehurst of the University of Ottawa indicates many patients have lesions or abnormalities in their right hemisphere. But often the false perceptions arise from psychiatric diseases such as schizophrenia and Alzheimer's

disease.

One patient, David, whose delusions began after an accident, was studied by neuroscientist Vilayanur S. Ramachandran, director of the Center for Brain and Cognition at the University of California at San Diego, and William Hirstein, a neuroscientist and philosopher now at Elmhurst College. In Ramachandran's book *Phantoms in the Brain* (Perennial, 1999), the man first claims that his mother and father have been replaced by a double. Not even the unchanged behavior of the rest of his family members can cast any doubt in his mind. In the book, Ramachandran points out that traditional psychology would attribute such delusions to Freud's Oedipus complex, according to which boys are sexually attracted to their mothers. Brain injuries abruptly reawaken these long-dormant wishes and plunge the victim into a state of severe conflict: "If she's my mother, how can I possibly feel sexual desire for her?" The way out: "She must be a different woman who only looks like my mother."

As Ramachandran subsequently notes, Freud's theory has long been discredited because of its obvious weaknesses. First, as the case with Madam M. shows, Capgras syndrome affects women as well as men. Second, patients do not by any means exclusively suspect their mothers.

### **Missing Emotions**

When Capgras syndrome develops, it is often soon after a severe head injury, as was the case with David. This correlation suggests that the disease arises from neurological malfunction. In the early 1990s psychologists Hadyn D. Ellis of Cardiff University and Andrew W. Young, now at the University of York, both in the U.K., suggested that Capgras syndrome might be caused by an impairment of object recognition and, in particular, facial recognition.

When we look at a face, neural impulses normally flow from the retina to the visual centers in the right temporal lobe, where perception emerges into conscious awareness. At the same time, the brain arouses our memories of faces, compares them with the present one, and establishes whether or not we have seen it before. All this appears to proceed normally in Capgras patients. They recognize a face correctly and can name the person to whom it belongs. But then they deny that the face is authentic. This means that in addition to the conscious pathway, there must be a second mechanism by which we ascribe a suitable identity to a particular face.

Seeing is more than a physical perceptual process. For example, a person does not admire a painting just for its deft brushstrokes or a certain combination of colors but for the emotions the painting elicits. Feelings are an integral part of the visual process. And indeed, neural pathways run from the vision centers to the amygdala, the seat of our emotional system. The face of a familiar person is thus coupled with the emotions that are linked to her identity, which are retrieved whenever we think of or see her.

The ability to make such associations appears to be impaired in Capgras syndrome. David, for example, looks at his mother and knows that the face he is perceiving belongs to her, yet it does not make him feel warmth or love. As Ellis hypothesizes, this disconnect creates a severe contradiction in David's experiential world. The challenge to David's brain might be summarized as follows: "How can this woman be my mother if her face leaves me completely cold? Something doesn't add up. Solution: It must be someone else, someone trying to pass herself off as my mother. A double!" As bizarre as this conclusion may seem, it makes perfect sense from the perspective of the brain, which will concoct whatever story is necessary to prevent the person's inner belief system from crumbling. Some experts think that Capgras delusion may be a protective mechanism employed by a brain that might otherwise be stymied by internal contradictions. Because distortion of the image of the external world largely occurs before the images reach conscious awareness, patients are unshakable in their delusion. They cannot be talked out of it by logic or reason, because they do not know that their brain has engaged in any manipulation.

### **Fake Voices**

Intrigued by the possibility that emotion influences perception, in 2001 Ellis and his Cardiff colleague Michael B. Lewis turned to a device similar to a lie detector, which measures certain physiological changes. Feelings such as fear or happiness affect the autonomic nervous system, which controls the blood vessels in the skin as well as the sweat glands. Fear and happiness increase sweat production, which changes the skin's electrical resistance--a variable that the device measures. Although this link is a crude indicator, it nonetheless reliably reflects the strength of an emotional reaction.

When researchers show healthy test subjects photographs of people they know personally, their skin resistance changes. But when Ellis and Lewis had conducted this experiment the previous year with Capgras patients, skin conductance remained unchanged. Even though the subjects recognized the faces of family members, the experience triggered no emotional response. This result helped to confirm that in Capgras patients, the unconscious association between a known person and the feeling attributed to that person is impaired. (This unusual circumstance is the converse of "face blindness," or prosopagnosia: a malfunction in the ability to recognize faces. An affected person will deny ever having seen the face of a close friend, even though they do exhibit the appropriate emotional reaction.)

Interestingly, there have been several reports of blind people who have Capgras syndrome. The disconnect is auditory. Analogous to the visual pathways, neural pathways also connect the auditory cortex to the amygdala and other emotion centers. The auditory pathways mediate the warm feelings elicited, for instance, by a dear friend's voice. In blind Capgras patients this neuronal connection is thought to be interrupted, and they can suspect that the voice of a loved one is really coming from an impostor.

This insight can be handy for family members who must deal with loved ones with Capgras. David's auditory pathways were intact, for example, and his parents made full use of them. Whenever he accused his mother of being a deceitful fake, she would

simply walk into another room and call him from a telephone there. Whenever David talked to his mother on the phone, he never doubted her identity.

### **Old Friends in a New Light**

Other than their mistaken theories about doubles and aliens, people with Capgras syndrome are quite normal. The condition harms only a small piece of the perceptual apparatus, albeit a crucial one. Yet because this delusion can also affect blind persons, it seems the impairment impinges on more than facial recognition. It strikes at the basic ability to identify others.

Although Ellis's neurobiological model provides an elegant explanation, it does leave several questions open. For example, a Capgras delusion is almost always very specific; it doubts the identity of only certain people, even when the patient has no problem identifying others with whom he is equally close. This is problematic for researchers: if the cause is a damaged link between the site of conscious perception in the cortex and the emotion centers, how can someone claim that his mother is a double but not his father? According to neurologist and psychiatrist Todd E. Feinberg of Albert Einstein College of Medicine, the problem is much deeper: before the onset of Capgras symptoms, patients must have had a loaded or ambivalent emotional relationship to the persons they later fail to recognize. This view is supported by Ellis and Lewis's observation that many patients are extremely suspicious of the supposed doubles and even of those people they consider to be "real." Studies seem to suggest that the condition tends to develop against a backdrop of clinical paranoia. Then again, it is easy to understand how someone who suddenly perceives family members as strangers would conclude that he is the victim of a huge conspiracy.

As with schizophrenia, with which Capgras is most frequently associated, the delusion arises in a patient who is emotionally "flattened." In contrast to injuries or stroke, schizophrenia involves no actual damage to brain tissue. Yet schizophrenia patients often barely feel positive emotions. If the diffuse aura of threat is added to this condition--which many schizophrenics feel already--the seeds of a delusion like Capgras syndrome have been sown. It is interesting to note that the Capgras delusion frequently disappears toward the end of an acute schizophrenic phase.

Another unanswered question is why people with Capgras delusion defend their theory of doubles against all reasoned arguments. Although it seems that the brain is defending its inner belief system, patients are well aware that relatives and doctors reject their claims. The patients almost never ask the obvious questions: "If an alien has replaced my wife, where is my real wife?" "Shouldn't I go to the police?" "Shouldn't I warn the world about this extraterrestrial invasion?"

Unfortunately, an unshakably distorted picture of the external world can sometimes lead to terrible consequences. Many Capgras sufferers consider their doubles to be evil, feel threatened by the impostors and react accordingly. Arturo Silva, a psychiatrist then at the Veterans Affairs Medical Center in Palo Alto, Calif., compiled 80 cases in which patients attacked a presumed double verbally or physically. Two of the attacks ended in death. Other research shows that most victims are family members.

It is unclear what determines the level of violence, but it should be kept in mind that Capgras syndrome is often a symptom of a more fundamental disease, such as paranoid schizophrenia. A paranoid schizophrenic sees himself surrounded by a hostile world that forever encroaches on him and attempts to torture him in every way. In these cases, it may well be the underlying psychiatric disease that is dangerous to others rather than the delusion itself. A 2002 study by Lefteris Lykouras of the Athens University Medical School in Greece, as well as research by others, shows certain antipsychotic drugs, such as olanzapine, sulpiride and trifluoperazine, can mitigate some violent tendencies in certain patients.

As bizarre as it may seem, Capgras syndrome is merely an extreme variation on how we all view our everyday experiences. What we perceive is intimately connected with our feelings. Assume for a moment that you have just purchased a dazzling new overcoat. Looking at your beat-up old coat in the closet, you cannot imagine why you wore it for so long. Yet it is the same coat you were perfectly happy to wear just yesterday. What has changed? Your emotional relationship to that coat.

And when an old friend disappoints us, we may shake our heads and say that he is not himself. But is it not more likely that our injured feelings have suddenly placed him in a different light? (This unusual circumstance is the converse of "face blindness," or prosopagnosia: a malfunction in the ability to recognize faces. An affected person will deny ever having seen the face of a close friend, even though they do exhibit the appropriate emotional reaction.)

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