

Recognizing human faces: a highly individual skill

One of the most taxing and complex processes that our brains must perform is to recognize the faces of those around us. This process is critical for social interaction since we learn about age, gender, identity, mood and other important information by looking at the faces of others. Therefore, it is not hard to imagine the serious consequences that can result when an individual has a face recognition disorder.

Even by compensating their deficit with various strategies such as recognizing people using voice or postural clues, this disorder can create many difficulties at a psycho-social level, such as depression, anxiety, social avoidance, and embarrassment. Lack of the ability to readily recognize another person's face can seriously affect one's social relations and professional success.

Even those individuals without this disorder possess varying capabilities in the recognition of faces: some can recognize faces easily while others frequently make mistakes. It is still under debate what allows one person to easily recognize the familiar man from the bakery shop when encountered in another context, such as on the bus, while another has serious difficulties even recognizing the baker in his own shop.

One pioneer in research on individual differences, such as Cronbach (1957), would have pointed out that the rich diversity in cognitive ability arises from a mixture of genetic and environmental factors and can be thought of as the result of "nature's experiments". Face recognition is a *special* ability, which appears to have been selected by evolutionary processes and depends on exposure to *specific* experiences occurring over a particular period of time.

Many studies have highlighted that different sensory processes and abilities are involved in face recognition, including the capacity to detect a face in a visual scene, to distinguish it from other faces, and to retrieve a stored identity representation from memory. It has been shown that inter-individual differences might be present at different processing levels: from low-level sensory-perceptual detection or discrimination up to the defining and encoding of a mental representation.

We have shown that event-related potentials, an electrophysiological technique similar to an electroencephalogram, for recording the activity of our neurons, indicate that the early cerebral activity specific for faces (which occurs around 170 milliseconds from the moment of presentation of the face) varies when those individuals who are good face recognizers see familiar and new faces. Meanwhile, this early brain activity does not vary in those who are not good recognizers when they try to recognize a known face and one which is not already known to them.

This millisecond difference in perception by good face recognizers shows what unique perceptual and cognitive processes they are using in a very efficient way.

It is still a matter of debate whether face recognition is genetically coded or heavily affected by an

individual's social environment, social skills and other personality traits or is a mix of "nature and nurture."

Maria Pia Viggiano

*Department of Neuroscience, Psychology, Drug Research, Child Health
University of Florence, Italy*

Publication

[Individual differences in face processing captured by ERPs.](#)

Turano MT, Marzi T, Viggiano MP

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