How a blind artist has challenged our understanding of colour

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For centuries, people who were born blind have been the intellectual curios of philosophers studying consciousness. This is particularly true for those exploring the way our consciousness is effected by our bodies, especially our eyes, which Leonardo da Vinci described as the "window of the soul".

One interesting fallacy is the belief that people born blind have no real idea of colour. In the 17th century, for instance, the philosopher John Locke thought parts of the world were peculiar to the individual senses. These parts could be seen in the lack of understanding of people who were blind or deaf. Similarly, David Hume believed that when the senses weren't stimulated by individual energies, such as light or sound, then no ideas could ever be formed.

Even in the 20th century, it was commonly believed that people born blind were unable to have a true understanding of the world around them. For instance, in 1950 the psychologist Geza Revesz wrote: "[No] one born blind is able to become aware of the diversity of nature and to apprehend all the rich and various appearances of objects." Philosopher Thomas Nagel felt that blind people had only the most shallow understanding of colour in comparison to those with sight.

Up until the 21st century, we had little idea about how we could test our beliefs about visual concepts. But then scientists became aware of a Turkish artist named Esref Armagan. Born totally blind, Armagan has no direct visual experience. Yet he paints and draws using not only colour, but also shadow, light and perspective in his unique imaginative scenes.

So how did Armagan learn about colour? The answer seems to be through a creative understanding of visual elements through language and his remaining perceptions.

The artist has strong memories of what he was told about the visual world by his father. Armagan was often taken to this father's engineering workshop as a child, and would ask questions about his surrounding environment.

Crucially, he also had opportunities to use this knowledge. Being an engineer, his father owned a scribe – a sharp tool for scratching, cutting and drilling points on metal – and Armagan used it to etch images on a card board.

Armagan's father would guide his blind son's hand over the engraved lines and describe what he saw. The young artist then practised making lines to represent visual edges and shading, which he showed to family members who provided feedback and more verbal descriptions.

Having mastered visual ideas such as edges and shade, the teenage Armagan began drawing in colour, and continued to seek comments and feedback from those around him. He described this process to my former student Ruth Cole as one of learning by repetition: "By asking and showing – over and over again."

Eventually, he switched his medium of choice to paint, recalling: "I started with coloured pencils and then switched to oil paints. But they took a long time to dry so I finally discovered acrylics."

Interestingly, Armagan does not paint with watercolours, because he builds layers of paint on board and paper with his fingers, letting each layer dry before he adds another. This technique allows Armagan to sense the various colours and shades he's creating as a substitute for seeing his new image.

A new artistic perspective

He has achieved a visual understanding through constant examination and discussion, supplemented through touch (he likens the colour red with the feel of something hot) and hearing (he compares the dimming of sound as it becomes distant with his use of visual perspective). He says: "I have created my painting in my head, including colours, before I ever start to paint. It is strictly memorisation."

Armagan's case challenges centuries of beliefs about colour. What's more, given the accurate descriptions provided by sighted family and friends, his work shows that it is possible for people born blind to understand, describe and create visual pieces of art.

Perhaps researchers should now be finding examples to demonstrate how people can achieve what is thought to be unachievable, rather than focusing on theorising disability. If we can manage this, we may well further our understanding of what the human imagination is truly capable of – instead of having a poor idea of its limitations.

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