

Babies' brains show consciousness at 5 months

Do you remember the subliminal advertising craze? It was all the rage a while back, and still lingers around today. Advertisers were accused of flashing images of their products – a bottle of Coke or a Big Mac – in a split-second during our normal TV or movie viewing. The idea was that even though we did not become aware of the image, our brains detected it, and behind the scenes were plotting ways to get us to purchase the item. Whether this actually works is still highly debated. Most Neuroscience research indicates that if there is an effect at all it is fleeting, and mostly conveys negative thoughts rather than anything positive. The way it works is this. When an object passes in front of us, the visual areas of our brain see it, but we do not become aware of the object unless the visual areas pass this information to higher brain centres, which are in our frontal lobes just behind our forehead. When this happens we become aware of the object: we can describe it, respond to it, and remember it. This awareness is what we call consciousness. And new Neuroscience research suggests that we acquire this ability as early as 5 months of age.

But how did Neuroscientists find this out? Babies, after all, are not able to tell us verbally when they see something. So the study started with adult participants who were shown objects, and asked to report when they first became aware of the object. At the same time the activity of their brains was recorded. This allowed the researchers to work out what the brain does, how its activity changes, when we become aware of something in our surroundings. That's right – they discovered the brain activity, or 'neural signature', associated with consciousness. Researchers then presented the same objects to babies, and looked to see if their brains showed the same activity patterns as adults. Remarkably, they did. And what's more, infants showed this activity as early as 5 months of age. The only difference is that it takes longer for a baby's brain to become aware of an object – about 9/10th of a second for 5 month-olds and 7/10th of a second for 12-15 month-olds versus 3/10th of a second for adults.

As humans we have consciousness not only of the things around us, but also of ourselves – our thoughts, feelings, sensations. Understanding consciousness, how the brain constructs consciousness and when during our lives consciousness begins are exciting and important areas of research. Such information gives us a window of understanding into ourselves, but it also could allow us to diagnose mental illness early and make decisions about how to treat brain-damaged people.

Reference: Kouider S et al. (2013) "A neural marker for perceptual consciousness in infants." *Science* 340: 376-380. DOI: 10.1126/science.1232509