K&A Brand Research

Mind reading: Is our thinking being decoded thanks to modern brain research?

Reading time 11 minutes

Mind reading - access to paradise or rather to hell? I have just read the exciting cover story by psychologist Prof. John Dylan Haynes in the German magazine Gehirn & Geist: The Myth of Mind Reading.

His research focuses on the decoding of mental states on the basis of brain signals. In market research in particular, there have been institutes for many years that promise to use brain research to get to our secret trigger points and thus virtually hand us over to neuromarketing. But what is the actual state of science? A little spoiler in advance. We often work with neurologists in the field of new therapies. The 'innovative' 'neuro' marketing research methods are not used by psychiatrists. When we ask about it, we get a disbelieving smile at best. I summarise Haynes' comments succinctly below. Here is the link to the article (German / paywall).

People have always wondered whether it would be possible to read the thoughts of others. There are many incentives for this. It would be great if we could better recognise our partner's feelings - this would prevent many misunderstandings. Paralysed patients, on the other hand, would have a better quality of life if they could control a prosthesis by willpower.
Just recently, the topic has again caused a great media stir due to new studies, although mind reading initially sounds like pure utopia.

In everyday life, we are often quite good at deciphering what is going on in the minds of our fellow human beings. This ability is also known as empathy. However, it has its limits if we only have purely external signs such as facial expressions, gestures or voice colouring as clues. Because people are also good at hiding their thoughts.

Another possibility is therefore to read the world of thoughts directly from inside the body, where the thought processes take place. Brain research has made enormous progress in recent years towards such technical mind reading. All our sensations, feelings, memories and desires are encoded in the activity patterns of our brain. Shouldn't it therefore be easy to extract them from it?

Picture credits: istockphoto.com / Shutter2U

Not even close:
Research over the last 30 years has shown one thing with a very high degree of certainty: even seemingly purely physical sensations such as an intuitive gut feeling can be traced back to neural processes.

Therefore, one would only have to measure the brain signals in a first step and then decode the thoughts and feelings hidden in them in a second.

However, the limitations of this approach are so obvious that even a group of lay people can come up with a long list of problems in no time, as Haynes has experienced in many of his workshops and seminars. Let's start with the first step: measuring the neural signals. To date, we have no method with which we can record the activity of all the estimated 86 billion neurons of the average human brain in real time.

In functional magnetic resonance imaging, or fMRI for short, the subject is placed in a tube in which a strong but harmless magnetic field prevails. Such scanners are an indispensable tool in modern brain research, but they only record neuronal activity indirectly: Since active nerve cells need more oxygen, the vascular system in the brain region in question readjusts and increases the blood flow, which can be measured as a signal. However, the procedure is not very accurate in terms of time - similar to the effect when we say something embarrassing and the blush rises to our faces: The vessels need a few seconds to dilate. It is therefore not possible to use fMRI to record individual thought or heard words in real time - the signal is much too sluggish for this.

The rapid whizzing of our stream of consciousness cannot yet be reliably and precisely recorded with such methods. No AI will help if the data is far too unspecific.

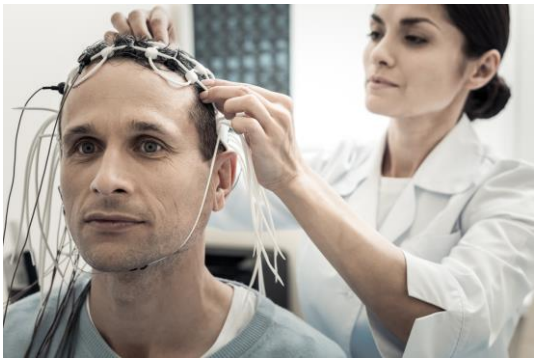

Photo credit: istockphoto.com / yacobchuk

The electroencephalogram (EEG) is much faster. It measures neuronal activity directly: electrodes on the scalp record the electrical signals of the cerebral cortex. However, since only the impulses of entire groups of neurons are strong enough to be recorded by the electrodes, the EEG can only be used to determine to within a few centimetres from which superficial brain region the activity originates. Although there are always reports of methods that suggest that even such resolution limits can be overcome, these often depend on unrealistic assumptions.

Artificial meshwork in brain tissue:
Due to the limitations mentioned above, innovative techniques are needed if human thoughts are to be fully captured in detail.

For example, tech billionaire Elon Musk and his company "Neuralink" are planning to insert a kind of mesh into people's brain tissue. There, micro-threads are to create a brain-computer interface that adapts to the shape of the cerebral cortex like a net. This "neural lace" could then measure the signals of the nerve cells on a large scale. However, the risk of strokes or injuries is immense.

We will therefore have to put up with the limited resolution of our current measuring techniques for a while yet.

The term mind reading or brain reading is actually misleading here. Because there is no question of reading. For that, one would have to be able to systematically interpret the measured patterns in a similar way to a language.
But we have nothing in our brain that corresponds to a letter, a word or a grammatical rule. Consequently, we should not talk about reading thoughts, but rather about deciphering them.

Photo credit: istockphoto.com / style-photography

In the simplest case, a test person was shown various pictures: of a dog, a cat, the Brandenburg Gate, a rose and so on. The brain pattern associated with each image was measured. After the training, the algorithm should be able to tell which of the previously shown photos the person in the test run is currently looking at. If we were to show two faces, we would probably not be able to tell from the patterns which face was shown.

Far too many possible thoughts:
One possibility would be to systematically scan through a large number of different thoughts in the scanner and thus create a large translation database. However, this fails due to several factors. For one thing, the number of possibilities is unbelievably large.

If Haynes asked you to write down all the thoughts you think might occur in such an experiment, you would probably never come up with "A hovercraft full of eels", which is borrowed from a Monty Python sketch.

In 2015, Haynes calculated that even if we had started measuring at the beginning of the universe, there would be nowhere near enough time to learn all the relevant patterns.

In addition, the following fundamental problem arises in the development of the translation table: We also need to know what a subject in the brain scanner is actually thinking. This is an age-old problem in psychology. Because if you ask someone to tell you what they are thinking, you disrupt their flow of thoughts. And even if the person were "thinking out loud", we would lose many details and nuances of their experiences in the verbal report. For this problem of subjective perception of the world, it is completely unclear what a solution might even look like.

There is another challenge: brain activity patterns vary greatly from person to person. If we know the neuronal signature for "dog" in one subject, we are far from knowing what it looks like in another. Everyone has their own highly individual learning history. One person associates the dog with a faithful companion. The other thinks of a childhood trauma. The associations we have with one and the same terms are accordingly very variable.

Questionable "neuromarketing":
So despite considerable technical progress, mind-reading capabilities are only just beginning. So it is very surprising that commercial applications are already being offered today.

Since the 2000s, there have been companies that operate neuromarketing. This is supposed to make it possible to recognise, on the basis of brain scans, how a product or an advertisement must be designed in order to trigger a desire in the buyer. The corresponding studies often measure the activations in the potential customer's reward system. However, it is too simplistic to assume that there is a kind of buy button in the brain. For example, the nucleus accumbens, a core region of the reward centre, becomes active even if one simply makes a great effort or sees something bizarre - regardless of whether this is rewarding or not.

Picture credits: istockphoto.com / standret

Other companies offer brain-based lie detectors that supposedly indicate whether someone is telling the truth or not. As things stand today, neither neuromarketing nor lie detection based on neural imaging are legit, despite occasional reports to the contrary. Note from my side: The task of a lie detector is incomparably easier than the question of how an advertisement has a neural effect. After all, it is ultimately only a matter of a yes or no phenomenon. Do you lie or do you not lie?

So even if these methods are not yet ready for application, the question still arises as to what we consider desirable in the first place. So-called neuropolitics tries to determine political attitudes from brain scans.

In 2022, for example, a research group from Ohio State University claimed to have decoded the neural signature of conservative or liberal thought.

At present, this only works with moderate hit rates, but if it were reliably possible one day, there would certainly be some questionably interested parties for this technique.

Such ethically problematic applications are contrasted with the ethically quite desirable ones. For example, paraplegic patients have a legitimate interest in research developing brain-computer interfaces that could help them control prostheses or communicate via spelling aids.

A final personal remark on neuromarketing. For many years, new neuromarketing methods have been hailed at market research congresses. The professional audience is flabbergasted - and no one questions the grandiose claims. I myself have had to pay a lot of dues. We tried to measure advertising impact with elaborate EEG equipment. But the noise remained stronger than the hoped-for signal. Despite the use of algorithms. This is exactly what professors in Erlangen had predicted. Well-done surveys were much more insightful. Our EEG studio is sensibly history.

K&A Brand Research

Book recommendation

By Ralph Ohnemus, Uwe H. Lebok, Florian Klaus:

Context marketing

The key to consumer behaviour to order.

Feedback, suggestions or criticism about this article:
braincandy@ka-brandresearch.com

The author
Ralph Ohnemus, CEO. Board member and main shareholder of K&A BrandResearch since 2001.
Previously a client of K&A BrandResearch for 15 years.
National and international marketing and sales experience in senior management positions, including FMCG, fashion, media and telecommunications - most recently as SVP Consumer Sales responsible for marketing, sales and chain stores at Viag Interkom O2.

Contact: r.ohnemus@ka-brandresearch.com