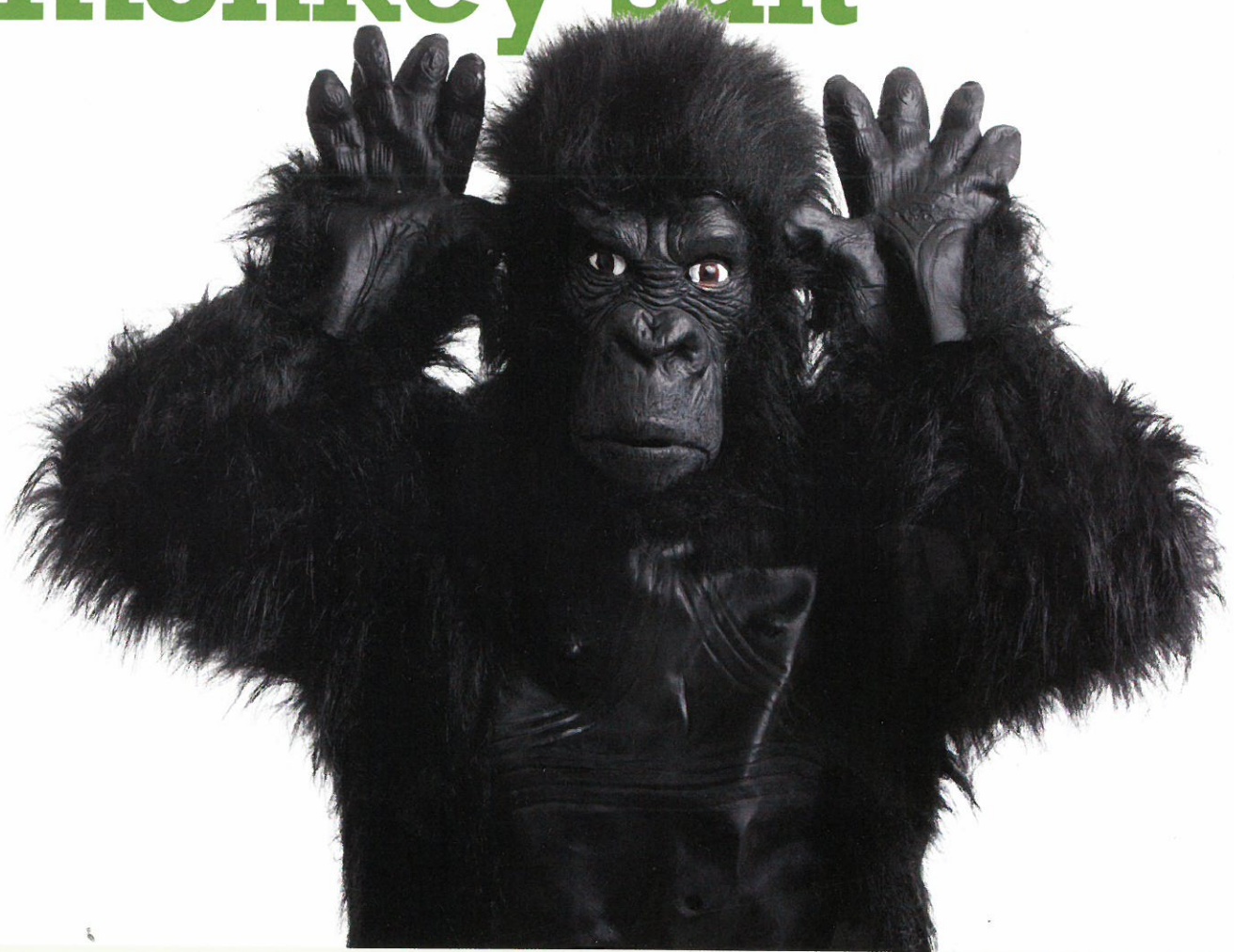


# Wearing the monkey suit



**W**hen we look at an ape, are we misinterpreting what we see? Do we see an animal, or do we treat them as if they are a human in a hairy suit?

'Anthropomorphism' is the attribution of human characteristics to inanimate objects, animals, forces of nature and other things. When we say 'dogs are loyal' or 'foxes are cunning', we are treating the animals as if they think and behave like humans. Dog owners sometimes believe their pet understands them, when in fact

their pet has just learned to predict when doggy chocs are likely to appear. We often take this a step further and attribute human qualities to machines. For example, you might talk to your computer as if it is deliberately messing you about.

We are more likely to see human qualities in objects and animals if we are feeling lonely (Shin and Kim 2020). It's as if we make up for a lack of human contact by giving life to the other things around us.

When we are being anthropomorphic, we are assuming that the animals or

## REFERENCE

Shin, H. I. and Kim, J. (2020) 'My computer is more thoughtful than you: loneliness, anthropomorphism and dehumanisation', *Current Psychology*, Vol. 39, pp. 453.

machines have a Theory of Mind – that they know what they are doing, and they are also responding to us. There is usually a simpler explanation for their behaviour – they are not thinking or feeling in ways that we do. Sorry about that.

**Phil Banyard**

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# Magic, deception and free will

A man with a beard and mustache, wearing a dark suit and tie, is looking directly at the camera. He is holding a playing card, the Ace of Hearts, in his right hand. The card is held up, showing its face. Numerous other playing cards are floating in the air around him, creating a sense of magic or sleight of hand. The background is a plain, light-colored wall.

**Jay Olson** explains how the secrets of magic can help reveal the mystery of free will

## SPECIFICATION LINKS

- free will
- determinism



**W**hen I was 5 years old, a furniture store worker pulled a coin from my ear. This was my first encounter with magic and I was fascinated. I started learning magic on my own and was performing by the age of 7. One of my early tricks, which you may have seen a magician perform, involved asking an audience member to pick a card. Audience members may feel like they can choose any card, but the magician pre-selects a card and uses sleight of hand or body language to nudge the audience member to choose it. Magicians call this 'forcing' – influencing decisions without the audience's awareness.

This example demonstrates free will and determinism, where the audience member feels they have free will, whereas their actions are actually being determined by the magician. I later used this principle of magic in order to investigate free will. But more of that later.

### Who controls our decisions?

One of the oldest questions in philosophy is whether or not we have free will, i.e. whether we have conscious control over our actions. Some schools of thought say no, we do not, claiming that we are governed by the laws of the universe. And therefore, everything that happens, including our thoughts and actions, necessarily follow in a causal (yet chaotic) chain of events. Everything is exactly how it has to be. Another school of thought argues that consciousness emerges beyond the sum of its parts and can enable free will. These debates have persisted for millennia and are unlikely to be fully resolved any time soon.

Beyond these philosophical arguments, though, it certainly *feels* like we have control over our actions. Few people live their life with a core feeling that every last thought is already predetermined and unchangeable. It *feels* like I am choosing these particular words to express my thoughts in this article and you *feel* like you are choosing to continue reading it. This pervasive feeling is sometimes used as proof that we have free will. Philosopher John Searle, for example, kept raising his hand during a lecture on the topic, trying to demonstrate that he was able to decide to raise his hand whenever he pleased and therefore controlled his actions (Wegner 2003).

### Double dissociation

Can this subjective feeling alone be used as proof of free will or conscious control? One

way to answer this question is to examine times in which it feels like we have control over a decision but we actually do not. Conversely, we could look at times in which it feels like we do not have control over a decision when we actually do. Uncovering both of these scenarios would constitute a *double dissociation*.

This idea of dissociation is used in neuroscience when trying to find which areas of the brain are responsible for different functions. If someone with a type of brain injury can speak but not understand speech, and if another person with a different injury can understand speech but not produce it, we could say there is a double dissociation between the two functions and they likely depend on different brain areas.

Analogously, if we can demonstrate that *feeling* like one has a free choice is dissociated from actually having a free choice, we can conclude that just *feeling* you have free will is not necessarily proof of having free will. But how do we convince someone that they have control over their decisions when they actually do not, and vice versa? For that, we can turn to magic.

### Research studies using magic

I wanted to use the principles of magic to dissect the feeling of free will. My colleagues and I conducted two research studies in order to do this. Study 1 aimed to show that we can feel like we have a free choice while the choice is actually predetermined, and Study 2 aimed to show that we can feel like our choices are predetermined while the choice is actually free.

#### Study 1: Pick a card, not any card

I mentioned 'forcing' at the beginning of this article. One way for a magician to do

One of the oldest questions in philosophy is whether or not we have free will

this is to quickly flip through a deck of cards and linger on one card longer than the rest. With careful timing, the magician can make the one card more likely to be chosen without the audience noticing that it was shown longer than the other cards.

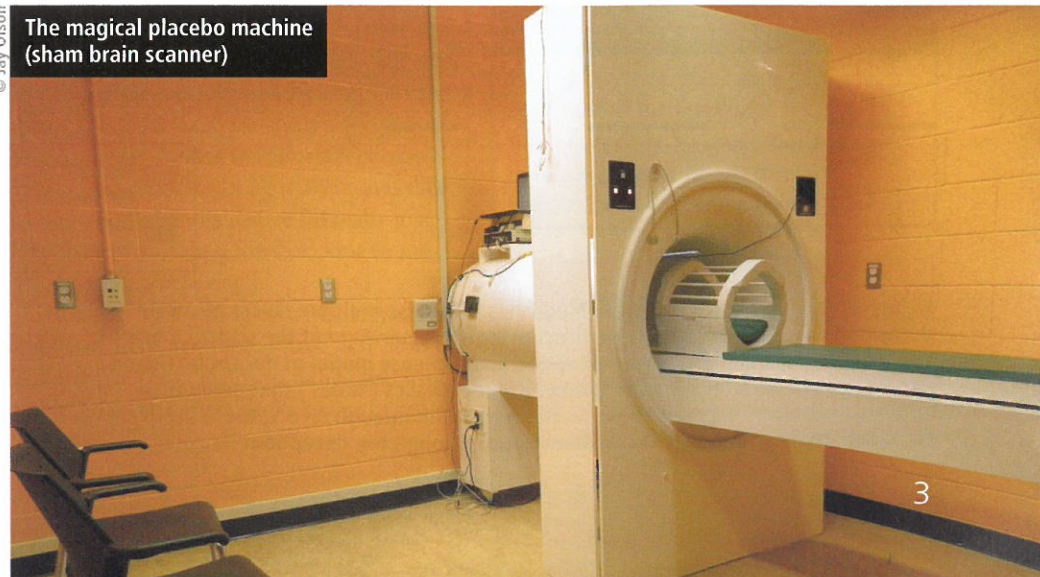
My colleagues and I (Olson et al. 2015) used a variant of this magic trick for Study 1. I approached around 100 people from the city of Vancouver and simply asked them to choose a card as I flipped through the deck. After they chose it, I asked them if it felt like a free choice or whether they felt I influenced their decision in any way. Almost all of them felt like they had a free choice, even though almost all chose the card displayed the longest. In other words, I was able to influence the participants without their awareness: they felt like they had a free choice but actually did not.

This result demonstrated the first half of the double dissociation – people felt that their decision was free without the decision actually being free.

#### Study 2: The sham brain scanner

The second half of the double dissociation is more complex. How could we convince people that they did not have control over their decisions, when they actually did? My colleagues and I (Olson et al. 2016) thought that a *magical placebo machine* (a fake or 'sham' brain scanner) could potentially be the answer. In reality, our 'brain scanner' was made of wood but painted to look like a real one (see the picture below).

The magical placebo machine (sham brain scanner)



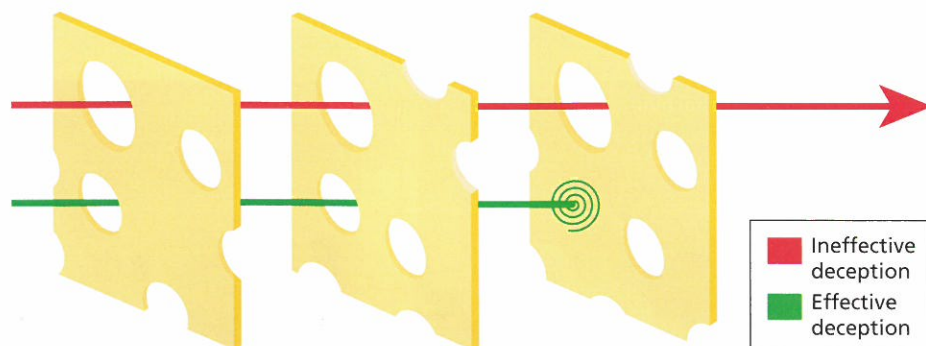


I once heard an audience member say, when the magician made a fake mistake: 'He got it wrong – it must be real.'

People have a lot of trust in neuroscience and we thought we could use this trust to persuade them that a new kind of neurotechnology could influence their thoughts. We decided to ask people to make a decision inside this (sham) brain scanner – if they believed the scanner was influencing them, we would have demonstrated the second part of the double dissociation.

Participants were told that our scanner used a new kind of neurotechnology which could translate thoughts into brain activity and brain activity into thoughts. They were led to believe that, after careful calibration based on their brain structure, the scanner could decode their brain activity and either infer what they were thinking or would attempt to influence their thoughts.

Our research design used 'layered trickery' (see Figure 1). This means that we had many layers of deception in our design – there was the elaborate-looking brain scanner and also a fake technician, lab coats, neuroscientific-sounding explanations and more. All of this enabled us to convince participants that the scanner could control their thoughts. Magicians often provide alternative explanations for their tricks, such as that they are reading body language or using telepathy to guess a participant's card. In reality, the secret is often simply a sleight of hand.



**Figure 1** Layered trickery model. Magicians often use multiple layers of subtle deception to hide their secrets or direct attention elsewhere at the critical moment. This kind of 'layered' trickery is called the *Swiss cheese model of deception* (Olson and Raz 2021). Each layer of deception has weaknesses ('holes') that perceptive audience members may see through. However, with enough layers, these holes are less likely to 'line up' to let the audiences see through the deception

Study 2 was divided into two tasks: mind reading and mind influencing.

### Task 1: mind reading

Imagine you are a participant in my study. You are told that the scanner will record your brain activity and that a neurotechnology technician (actually, my colleague Mathieu) is sitting next door to collect the results from the scanner. You enter the scanner and are asked to silently choose any two-digit number.

The technician then enters the room and gives me (the experimenter) the scanner's guess of your number, written on a piece of paper. I ask you for your chosen number. You say it aloud and I show you the technician's paper. If the scanner's number is the same as yours, that should lead you to believe that the scanner has just read your mind. (You may be wondering how the technician gets the number right – it involves a simple magic trick ... which I cannot reveal! Sorry!)

In order to make you more convinced that the scanner can indeed read minds, on the first trial the scanner is always a little off (for example, you said '42' and the machine guessed '24'). Magicians often use fake mistakes to make their performance more believable. If the magician really was guessing your card by reading body language or through telepathy, you would expect that it may not work perfectly every time. During a magic show, I once heard an audience member say, when the magician made a fake mistake: 'He got it wrong – it must be real.' Similarly, when the scanner got the first number wrong, this made the procedure seem more realistic.



After the first trial, there are two further trials where the scanner's answer matches yours. This should lead you to have a strong belief in the scanner's ability to guess your number correctly. We manipulated your expectations about what the scanner could do.

### Task 2: mind influencing

For the next task, you are told that the scanner will choose a random number. The technician writes it down on a piece of paper, then he brings it into the room and places it face down. As the experimenter, I explain that the scanner is now going to try to influence you to choose the number on the paper using 'natural electromagnetic fluctuations'.

Again, you enter the scanner, choose a number, exit the scanner and then say your number out loud. I flip over the piece of paper to reveal the scanner-generated number. As before, the scanner's number does not match your number on trial 1 but *does* on the next two trials. It appears as if the scanner has chosen a number and then influenced you to pick it (again, simple trickery was used to ensure a match).

### Explanation and results

The function of Task 1 was to convince the participants that the machine could





read their mind. At the end of the task, participants were asked to fill in a questionnaire: the Sense Of Agency Rating Scale. This assessed how much control they felt over their decisions.

The function of Task 2 was to convince the participants that the machine could also *influence* their decisions. After Task 2, we again gave the participants the Sense Of Agency Rating Scale. Finally, we compared the two sets of results from the Rating Scale (one set from the mind-reading task and one set from the mind-influencing task). The mind-reading measurement provided a baseline to which we could compare measurements taken after the mind-influencing task.

My research suggests that, even though we believe we have control over our thoughts and decisions (i.e. we believe we have free will), this is not necessarily true

We found, as expected, that participants experienced a greater sense of control (free will) in the mind-reading task than the mind-influencing task.

Participants only reported unusual experiences during the mind-influencing task, which is exactly when we predicted that they would feel that their free will was impaired. Some said their decisions did not feel like their own ('I felt like [the number] ... wasn't my choice. I don't know why I chose it') or that their brain chose a number they did not want ('I was going ... with 34, but my brain just told me no, that's not the number'). Others felt that the scanner itself chose the number ('I can't put my finger on it ... just like ... once the [scanner] turned on ... I got 4, and then I got 7') or that they could not explain its source ('It really just felt like [the number] kind of came to me [from] somewhere else').

In short, by dressing up a magic trick as elaborate neurotechnology, we were able to convince participants that they had lost control and that their choices were being determined by an external force.

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## A double dissociation

The 'Pick a card, not any card' study showed that people can feel they *have* control when they actually don't have control. The sham brain scanner study showed that people can feel they *don't have* control when they actually do have control. The two studies complete a double dissociation between the feeling of a free choice and actually having it.

My research suggests that, even though we believe we have control over our thoughts and decisions (i.e. we believe we have free will), this is not necessarily true. The feeling of control is more likely to be a consequence of expectations and context. Therefore, the core feeling that we are in control of our lives is not a good argument either for or against free will. It is merely a context-dependent feeling.

From a childhood coin trick to elaborate experiments, this exploration has revealed that our feeling of control may be just as carefully constructed – and as deceptive – as a magician's illusion.

## DISCUSSION POINT

Why do you think that people have a feeling of free will in the first place?

If this feeling can be manipulated in different contexts, do you think this malleability is a benefit or a drawback?

Jay Olson is a postdoctoral fellow in the Department of Psychology at the University of Toronto and studies a range of topics including smartphone addiction, placebos, sleep, creativity and psychedelic drugs.