

Meme, Myself, I

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Hold out your arm in front of you. Whenever you feel like it, of your own free will, flex your wrist. Repeat this a few times, making sure you do it as consciously as you can. You'll probably experience some kind of decision process, in which you hold back from doing anything and then decide to act. Now ask yourself, what began the process that led to the action? Was it you?

Neuroscientist Benjamin Libet of the University of California in San Francisco asked volunteers to do exactly that. A clock allowed the subjects to note exactly when they decided to act, and by fitting electrodes to their wrists, Libet could time the start of the action. More electrodes on their scalps recorded a particular brain wave pattern called the readiness potential, which occurs just before any complex action and is associated with the brain planning its next move.

Libet's controversial finding was that the decision to act came after the readiness potential. It looks as though there is no conscious "self" jumping into the synapses and starting things off.

This and other research has led me to believe that the idea of "self" is an illusion. You are nothing more than a creation of genes and memes in a unique environment. Memes are ideas, skills, habits, stories, songs or inventions that are passed from person to person by imitation. They have shaped our minds, leading to the evolution of big brains and language because these served to spread the memes. But the memes with the cleverest trick are those that persuade us that our "selves" really exist. We all live our lives as a lie. The memes have made us do it--because giving us the illusion of "self" helps them to survive and spread.

The term meme was coined by biologist Richard Dawkins in his 1976 book, *The Selfish Gene*, which explored the principles of Darwinism. Charles Darwin's insight is simple, yet often misunderstood. It is this. If organisms vary, if only some of them can survive, and if whatever helped them survive is passed to their offspring, then the offspring will be better adapted than their parents were. In this way the organisms become designed, by the blind processes of copying and selection, for the environment in which they live. As Dawkins puts it, if you have variation, selection and heredity, then you must have evolution.

Darwin did not have the benefit of our modern concept of an algorithm, nor our tendency to look at everything from fundamental physical processes to life itself in terms of information (see "I is the law", New Scientist, 30 January 1999, p. 24). Yet he saw how this mindless procedure could produce design without a designer. It was the American philosopher Daniel Dennett who dubbed the process "the evolutionary algorithm". At its heart is the information that is copied, or the replicator.

In biological evolution, the replicators are genes, but there is no reason why there should not be other evolutionary systems, with other replicators. This was Dawkins's point--that Darwin's insight was too important to confine it solely to biology--and he wanted another example. So he invented the meme.

Everything you have learnt by copying it from someone else is a meme. This includes your habit of driving on the left or right, eating beans on toast, wearing jeans or going on holiday. You would do none of these things if someone else hadn't done them, or something very like them, before you did. Imitation, unlike other forms of learning, is a kind of copying or

replication. Other animals can be masters of learning, as when squirrels remember their hundreds of food stores, or cats and dogs build extensive mental maps. But this is learning by association, or trial and error. Only by imitation are the fruits of the learning passed on from one animal to the next--and humans are unrivalled when it comes to copying one another.

But are memes replicators? In other words, do they fit into the evolutionary algorithm of variation, selection and heredity? I say the answer is yes. Memes are "inherited" when we copy someone else's action, when we pass on an idea or a story, when a book is printed, or when a radio programme is broadcast. Memes vary because human imitation is far from perfect, and the vagaries of memory mean that every time we retell a story we change some little detail, or forget some minor point. Finally, there is memetic selection. Think of how many things you hear in a day, and how few you pass on to anyone else. Think of how many scientific ideas you have read in this magazine, and how few you will remember.

To understand what makes a meme successful, let's take a "meme's eye view". Imagine a world full of hosts for memes (such as brains), and far more memes than can possibly find homes. Which memes are likely to find a safe home and get passed on again? Highly memorable ones should do well, as should useful ones (such as science, perhaps), and ones that provoke strong emotional reactions. Those that fit well with our genetic predispositions should succeed--so sexy photos get everywhere, and recipes can spread around the world.

Chain letters, like viruses, spread because they include instructions to pass them on, along with threats or promises. The same can be said of cults and religions--indeed Dawkins calls religions "viruses of the mind". They succeed because of the tricks they use to persuade us to copy them. If this sounds as though memes have plans and intentions, remember that the only process going on is selection. The memes that get copied--for whatever reason--stay with us, the rest die out.

Some people object to the whole idea of memes on the grounds that memes are not like genes. No, they are not. We cannot pin memes down to a single molecule of DNA as we can with genes. Memes also vary enormously in the size of their effective unit, from a few notes to a whole symphony or from a single word to a whole book. And while genes use the cellular machinery of protein synthesis for their replication, memes use the human brain as their copying device.

So if we try to draw strict analogies between genes and memes we will be led astray. The right starting point is not the analogy with genes, but the principles of Darwinism. From this perspective, a human being is the creation of two selfish replicators, genes and memes, working together. And once we look at it this way, some of the mysteries of the human mind begin to fall into place.

For example, why do we have language, a complex culture and such an enormous brains? These evolutionary developments did not come cheap. We can speak only because our neck, mouth and brain have been completely restructured. In proportion to our body mass, our brain is three times as large as that of our nearest relatives. This huge organ is dangerous and painful to give birth to, expensive to build and, in a resting human, uses about 20 per cent of the body's energy even though it is just 2 per cent of the body's weight. There must be some reason for all this evolutionary expense.

Coevolution

Early theorists suggested that our bigger-brained ancestors survived because they were better at hunting or finding food, while more modern theories emphasise complex social pressures. For example, the Machiavellian intelligence hypothesis suggests that our ancestors needed a larger brain to deceive others, detect deception, and remember who had done what to whom (see "Liar! Liar!", *New Scientist*, 14 February 1998, p 22). According to psychologist Robin Dunbar of the University of Liverpool, the function of

language is gossip, and gossip is a substitute for grooming for keeping large social groups together. Other theories emphasise the use of symbols and their importance in communication.

These theories all have something important in common. They assume that the ultimate function of the human brain and of language is to serve the genes. If you are a Darwinian, you might think that this is the only possible answer because design for a function can only be the result of natural selection working through genes. Yet that would be to take too narrow a view of Darwinism, for genes are not necessarily the only replicators. Once you allow the idea that memes have been coevolving with genes, a new possibility opens up--that the human brain and language evolved not to spread genes, but to spread memes.

It could have worked like this. Members of a species of early hominid acquired the difficult and rare skill of imitating each other. At first they imitated things important for survival, such as new ways of carrying food, hunting or making tools. Since these skills helped them survive, it made sense for everyone else to imitate the best imitators, and also to try to mate with them. This meant that genes for being good at imitation spread and, since imitation is difficult and requires a large brain, brain size increased.

And as early humans became ever more skilful imitators, any meme that was good at getting itself copied, for whatever reason, would tend to spread. The practice of copying sounds for communication was one of the more useful memes for humans. Sound can be used to transfer memes to many people at once. If it can be grouped into distinct units--as it is with words--then the copying fidelity is improved, and memes will spread farther and more easily without being corrupted.

If variations of word order can be copied, then more niches for memes open up, allowing more memes to spread. As people both imitate, and try to mate with, the best imitators, the ability to copy complex words in precise orders will be spread, both memetically and genetically. In other words, by what we might call "memetic driving", the memes put pressure on the genes to create ever better apparatus for spreading them. This means big brains designed especially for language.

This process might seem unfamiliar, but in fact something similar occurred long ago, when genes coevolved with the cellular mechanisms that copy them. In their new book *The Origins of Life*, John Maynard-Smith and Eörs Szathmáry urge us to view life on the largest scale, starting with the first simple replicating molecules. They describe all the major changes in the way information is transmitted, copied and stored. The appearance of memes can be seen as the latest stage in this evolutionary process. It explains the appearance of a species capable of language and complex culture. We are meme machines.

What's more, this process has not stopped. It is still creating new meme-copying devices. While human language is a vast system for transmitting memes with high fidelity, it took the invention of writing to enable memes to be stored. Now telephones, fax machines, photocopiers, computers and the Internet all increase the speed and ease of meme-replication. We may think that we invented all these machines for our own convenience, but once memes got going, these devices--or something like them--were inevitable. The real driving force is the evolutionary algorithm. And the real beneficiaries are not us but the selfish memes.

Just as selfish genes group together for mutual protection, so whenever memes can propagate better as part of a group than on their own they form co-adapted meme complexes, or memplexes. Memplexes include languages, religions, scientific theories, political ideologies and belief systems such as acupuncture or astrology. Like memes, memplexes spread as long there is some reason for them to be copied. Some are true or useful, others are copied despite being false.

These vast memplexes, with their varied means of propagation, form the very stuff of our

lives. Yet there is one memplex, perhaps the most powerful of all, that we readily overlook. That is our own familiar self. Like other animals, we have a body image--a plan of our body used for organising sensations and planning skilled actions. We also have, as some other animals do, the ability to recognise other individuals and understand that they, too, have desires and plans. So far so good--but now we add the capacity to imitate, the use of language and the word "I".

Heart of the selfplex

At first "I" may mean just "this body", but soon it begins to change. We say "I like ice cream", "I can't stand shopping malls", "I want to be famous", or "I believe in Father Christmas". And the "I" no longer refers just to a body, but to some imagined inner self that has intentions, possessions, fears, beliefs and aspirations.

This "I" forms the heart of the selfplex. And all the memes in your selfplex thrive because you work to defend them in arguments, to promote them in discussions, perhaps even to write about them in books and articles. In this way these self-related memes succeed where others fail, and so the selfplex grows.

Once the "self" has begun to form, it meets each new idea it comes across with "Yes, I agree with this" or "No, I don't like that". Although each self is unique in the body it describes as "mine", and in the ideas it picks up along the way, those ideas are all memes and the self offers them a safe haven.

I think modern neuroscience makes it clear that the self cannot be what it appears to be. We may feel as though we have a special little "me" inside, who has sensations and consciousness, who lives my life, and makes my decisions. Yet, this does not fit with what we know about the brain. Look inside a brain and what do you see? There is no central place into which all the impressions come and from where the orders go out. Rather, there is a massive processing system dealing with numerous things at once, only very few of which ever reach consciousness.

It may feel as though "my" consciousness starts the actions this body performs, but as Libet's experiments showed, conscious awareness takes about half a second to build up, far too long for it to initiate reactions to a fast changing world. And the brain is constantly being changed by everything that happens to it, so that "I" am not the same as I was ten years, or even a few moments, ago.

There is a long and venerable tradition of thinkers who have rejected the idea of a real and persistent self. The Buddha proclaimed that actions and their consequences exist, but that the person who acts does not. According to the Buddhist doctrine of **anatta**, the self is more like an ever-changing construction than a solid entity. The 18th-century philosopher David Hume likened the self to a bundle of sensations tied together by a common history.

Using more contemporary metaphors, Dennett argues that the brain builds multiple drafts of what is happening as information flows through its parallel networks. One of these drafts becomes the story we tell ourselves and includes the idea of an author of the story, or a user of the brain's virtual machine--consciousness is a "benign user illusion". So rather than being a permanent, persisting entity, the self may be more like a story about a self that does not really exist.

I believe these ideas have implications for the way we live. As society becomes more complex, and memes spread faster and farther, so our selves become more complicated. The unhappiness, desperation and psychological ill-health of many modern people may reflect the fact that increasing numbers of memes are using our poor over-stretched brains to construct a false self for their own propagation. Perhaps the user illusion is not so benign after all. Some would even say that belief in a permanent self is the cause of all human suffering--of fear,

jealousy, hatred and unkindness.

But is it possible to live life without the illusion? One way might be to calm your mind. Techniques such as meditation, say, can still the memes that are constantly competing for your brain space, forcing you to keep thinking. Long traditions of training in meditation show this is possible: that years of practice can bring emptiness, compassion and clarity of mind. Meditation, at its simplest, consists of just sitting quietly and clearing the mind of all thoughts, and then, when more arise, just letting them go.

Meditation is itself a meme, but is, if you like, a meme-clearing meme. Its effect is not to obliterate all awareness, but rather to create an awareness that is more spacious and open, and seems, perhaps paradoxically, to be without a self who is experiencing it.

If this memetic analysis is correct, the choices you make are not made by an inner self who has free will, but are just the consequence of the replicators playing out their competition in a particular environment. In the process they create the illusion of a self who is in control.

Dawkins ends *The Selfish Gene* with his famous claim that: "We, alone on earth, can rebel against the tyranny of the selfish replicators". Yet, if we take his idea of memes seriously, and push it to its logical conclusion, we find that there is no one left to rebel.

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