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## Psychology of Magic: 3 Critical Techniques



IN 2007 A group of magicians including [James Randi](#), Teller, one half of [Penn & Teller](#) and others, gathered in Las Vegas to talk about the psychological principles they use to produce magic. Nothing unusual there, except that their audience was made up of psychologists and neuroscientists attending '[The Magic of Consciousness Symposium](#)' organised by the [Association for the Scientific Study of Consciousness](#).

The aim of this collaboration between magicians and psychologists was to help uncover new ways of investigating human thought and behaviour. Now two articles on the psychology of magic have been published in prestigious academic journals. In [one paper](#) in *Nature Neuroscience* the magicians, with the help of academics [Stephen L. Macknik](#) and [Susana Martinez-Conde](#) explain the psychological principles magicians use. In [the other](#), appearing in *Trends in Cognitive Science*, [Dr Gustav Kuhn](#), points to how magician's techniques can be used by psychologists to develop new avenues of research.

Psychologists are interested in the principles of magic because magicians have been carrying out informal behavioural experiments on people for centuries and have built up a huge array of techniques - many psychological - to create their mind-bending effects. Tricks often rely on manipulating people's expectations, misdirecting their attention and subtly influencing decision-making - all the kinds of things that intrigue psychologists.

While *physical* misdirection, *physical* illusions and *physical* 'forcing' (see number 3 below) are well-known magical techniques, less is known about their *psychological* counterparts. So here are three critical psychological techniques oft-used by magicians of all types which psychologists are just beginning to explore experimentally.

### 1. Psychological misdirection

Physical misdirection is a well-known tool for the magician: he points at an object, a big gesture distracts, spectators fixate on a suddenly appearing dove. All are designed to distract from another movement that is vital for the trick.

Psychological misdirection is much more subtle - a good example is the false solution. This is where the magician

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leads spectators to believe they've worked out how the trick is done. Once this 'solution' is suggested people are much less likely to notice the clues that crop up as to how it's really done. Instead people look for confirmation that their own theory is correct. When the magician finally shows this 'solution' is no such thing, spectators are left even more bemused. The false solution is, therefore, not just a happy coincidence, it is used as a distraction from the real solution.

[Research](#) in problem solving shows that once we have one solution in mind, it is very difficult to consider alternatives. Something like this effect is a common occurrence when, for example, we're trying to remember the name of a particular actor and get the wrong one 'stuck' in our head. We know it's not Christian Bale, but we can't seem to get his name out of our heads so we can remember who it really was.

A recent [study](#) by Dr Gustav Kuhn of York University and colleagues has examined a very simple use of misdirection in the vanishing ball trick. This is where the magician throws a ball into the air three times, but on the third occasion it disappears. Dr Kuhn, a practicing magician, is shown demonstrating the trick in [this clip](#):



In reality the magician has [palmed](#) the ball on the third throw but still looks upwards as though expecting to see the ball in flight. The spectators follow the magicians social cue and look up as well.

Dr Kuhn's study found that it's this social cue of looking upwards that has a huge part to play on whether this simple trick works or not. Around two-thirds of observers said they saw the ball actually moving upwards when the magician looked up. But, in another condition when the magician continued to look at his hand only about one-third thought they saw the ball moving upwards.

## 2. Cognitive illusions

Many an elephant, aeroplane or major landmark has been disappeared with the use of physical illusions: smoke and mirrors or other hardware techniques. But magicians also use mental illusions which can fool our attention or play with the way we predict the future.

[Research](#) suggests that it takes about a tenth of a second

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from information arriving in the brain to its conscious perception. Living a tenth of a second in the past is potentially deadly so we seem to get around this lag by 'predicting the present'. Even before incoming stimuli are fully processed our brains are trying to work out what is going in the 'future', i.e. right now.

Our automatic predicting of the future is often used by magicians to trick us. The most common example is where a coin is made to disappear after it is apparently passed from one hand to the other, when it has in fact been palmed. Because the mind is already working ahead, assuming the coin has been passed to the other hand, it's as though it has disappeared when the other hand is revealed to be empty.

Cognitive illusions can also rely on manipulating our attention. It is incredible what changes we will miss if our attention is directed elsewhere. The classic example is [Simons & Chabris' \(1999\)](#) study in which many people fail to notice a man walking right across their field of vision in a gorilla suit (see also: [choice blindness](#)). An elegant demonstration of this effect has been produced by another magician/psychologist [Professor Richard Wiseman](#) - watch [the video](#) below. It starts off as a boring trick, but hold on until half-way through for the punch-line.



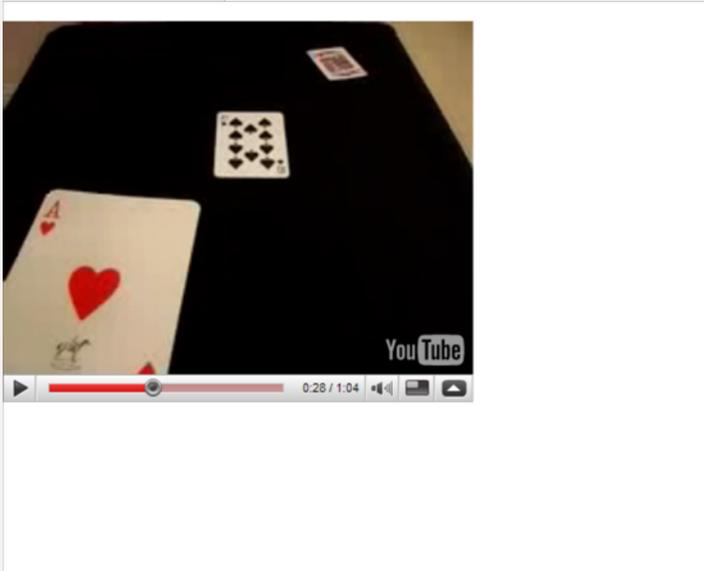
Psychologists have begun to probe the reasons why we're so poor at spotting such obvious changes like this. One theory is that it mostly depends on where we happen to be looking at any given moment. To test this, [research](#) by Dr Kuhn and colleagues has used eye-tracking technology to map out exactly where participants are looking while they are watching a magic trick.

Their results show that the trick works not because our eyes don't happen to be looking in the right direction, but because our attention is directed elsewhere. Surprisingly psychologists have found that exactly where we're looking and what we're paying attention to can be two different things. In this study even participants who were looking directly at the area where the deception was being perpetrated often didn't 'see' the deception, because their attention was directed elsewhere. It seems where we're looking isn't as important as what we're paying attention to.

### 3. Mental forcing

At its least sophisticated physical forcing is asking a spectator to pick a card from a special pack containing 52 aces of spades. Obviously the ace of spades can't be avoided. But magicians consider this inelegant and prefer to use mental forcing to create their effects.

A more subtle, psychological, version of forcing involves giving a spectator the impression that they have a free choice from all 52 cards, but actually use some technique to expose them to the ace of spades for longer than the other cards, thereby influencing their decision. The spectator is then put under pressure to answer quickly but, at the same time the free choice is still emphasised. In fact the 'free choice' was no such thing at all. Professor Richard Wiseman [demonstrates](#), but with a twist in the tail:



This is why magicians spend so much time emphasising to spectators how free their choice was. Magicians are effectively trying to rewrite spectators' vague memories of being implicitly influenced and under pressure with the idea that their choice was completely of their own volition.

It turns out that magicians are much better at mental forcing than psychologists who have often recorded only modest effects in laboratory conditions.

#### Find out more...

Psychologists have only just begun to use magician's techniques in the laboratory and they clearly still have much to learn.

If you're interested in learning more about magician's psychological techniques the complete Nature Neuroscience article is currently [available online](#). You can also download videos from the 'The Magic of Consciousness Symposium' of presentations given by Teller, Apollo Robbins, The Amazing Randi, Mac King and The Great Tomsoni via [Susana Martinez-Conde's site](#).

Here is Teller's very entertaining presentation which has been [uploaded to YouTube](#). And if you're not used to seeing him actually talking (he's resolutely mute during his act) you may find it weird to begin with!



## 2 comments

[Alice](#) on 31/8/08 3:36 PM

In the Richard Wiseman video, why is there a man in a gorilla suit watching the filming? I kept watching very very carefully for the big gorilla I'd also missed, but he just sits still!

[Michelle](#) on 2/9/08 1:06 AM

I will never sit through another magic show in Branson and think the same way that I used to! I wasn't aware of the mental forcing and manipulation of my mind. I guess I was busy "vacationing" my mind, but it all makes sense through the information and insight of this article. Amazing how it all weaves together!

Michelle

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