SEEING AND BELIEVING

Peter Lamont & Richard Wiseman

Before we became respectable, we were magicians. We funded our degrees by performing in what is known, to both academics and magicians, as the real world. Since we entered the strange world of academia, we have kept in contact with both the world of magic and the real one. In past projects, we have conducted seances for the public, have analysed the evidence for the Indian rope trick, and have performed magic that fooled magicians but not real people. But it was not until we came to Las Vegas that we became involved with such dishonesty, such a strange card trick, and such an elusive gorilla. It was good to be working in the real world again.

Our road to Las Vegas had begun in London, at a meeting of the SciArt panel. The purpose of the SciArt consortium is, as the name suggests, to promote collaboration between scientists and artists. The consortium, supported by a number of prestigious institutions such as the Wellcome Trust and the Arts Council of Great Britain, fund a small number of projects each year. We had submitted a proposal to explore the potential of collaboration between psychologists and magicians. This, it has to be said, was not an entirely new idea. In 1896, Joseph Jastrow tested the skills of Harry Kellar and Alexander Herrmann in an attempt to discover what made magicians so effective at deception. A century later, we published a book - *Magic in Theory* (Hermetic Press, 1999) -, which outlined the theoretical and psychological elements of conjuring for psychologists. But this project would be different. It would not just be about what psychologists could get from magic, it would also be about what magicians could get out of psychology. And while both of us have a background in magic, we were not the best people to determine that. If this was to be a proper collaboration, broader magical expertise than our own would be required. We would need a place full of world-class magicians, and one well-connected magician who would be a co-applicant in the project. That is why we had phoned Las Vegas and spoken to Mac King. Fortunately for us, Mac had had no other commitments than two sell-out shows per day and the prospect of fatherhood rapidly approaching, and had been unable to think of any reason not to agree. And so, at that meeting in London, a panel of prominent scientists and artists had heard about the 'Psychology of Magic' proposal. A few weeks later, we were told that we had been successful, and in August we arrived in Las Vegas for the MAGIC LIVE 2001 convention.

By the time we had arrived, we had outlined two key areas that had obvious links with both psychology and magic. The first of these was lying, which psychologists have carried out a lot of research on. They have identified various behaviours associated with lying, such as an increase in body movement and speech errors, or a decrease in speech rate and length of answer. But all this work has been done with unskilled liars from the general public, not with magicians, and certainly not with Max Maven. As one might expect, Max can be a very good liar when he wants to be, and we wondered just how good his deceptive abilities were. So we filmed him recalling personal anecdotes,

some of them true, some of them untrue. We subsequently showed these clips to various groups of people, asking which were true and which were lies.

The clips were shown to magicians at the MAGIC convention, to the public via Nature.com (the website of the science journal), to a live audience of scientists and artists at a later SciArt conference, and to a group of professional fraud investigators. Each of these groups, about 750 people in all, watched clips of Max lying and telling the truth, and tried to distinguish the truth from the lies. If Max were a perfect liar, one would expect people to guess correctly exactly 50% of the time simply by chance. Magicians did no better than this, despite many of them knowing Max personally, neither did the public, nor did the scientists and artists. The professional fraud investigators did only slightly better, but still not statistically better than they could have done by guessing.

For us, however, the most interesting part was to do with indirect measures of lying. Recent research suggests that if we assess whether the person lying/truth telling appears to be nervous, acting, thinking hard, etc., this actually enhances our ability to detect lies. So we had forty people assess whether Max appeared to be nervous, acting or thinking hard as he was talking, and then judge whether he was lying or telling the truth. One would now expect their results to be higher than chance, but they were not. Instead, they performed far *below* chance, correctly spotting only 29% of the lies. It seems they correctly identified when Max was nervous, acting or thinking hard, and assumed this was when he was lying. In Max's case, however, this was when he was telling the truth. Max was communicating (consciously or unconsciously) the opposite behaviour to that of unskilled liars, in order to successfully deceive the audience. The study was, however, only exploratory, and we cannot make any strong claims about the results without further research. What does seem clear from this initial study, however, is that Max is a very good liar. It was, therefore, a little disconcerting when he told us how much he had enjoyed working with us.

The area that attracted most interest among magicians, however, was change blindness, which refers to our ability to miss large changes in our visual field in certain circumstances. Psychologists at Harvard have demonstrated some fascinating examples of this. The most startling demonstration requires subjects to watch a short clip. In the clip, there are two teams (dressed in white and black respectively) of three players each. Each team has a basketball, and passes their ball among their own players. The task given to the subject is to count the number of passes made by the white team only. During this clip, which lasts for only half a minute, a person in a gorilla costume walks right through the middle of the players, stopping halfway to brazenly thump his (or her) chest, before walking off to the left. And most people watching the clip do not notice the gorilla.

Magicians, of course, are masters of misdirection. We suspected they would be more difficult to deceive with such a blatant piece of misdirection. We were wrong. Of all those who watched the clip, and these included some of the best minds in magic, only a handful spotted the gorilla. Some of those who did not spot it watched the clip a second time, then accused us of switching clips. Some of those who did spot the gorilla did not

believe others would miss it, until they saw someone they respected watch the clip then say, “what do you mean gorilla?”. Enjoyable as all this was, and it certainly was enjoyable, there are more important implications. In terms of psychology, it shows us the extent to which we can focus on particular tasks, and blank out what we regard as irrelevant. The fact that magicians did not do significantly better than lay people at this task, and appeared equally surprised that it would work, suggests their expertise in misdirection is specific rather than generic. In terms of magic, however, such demonstrations show that if we have an appropriate task, we can exploit this tendency to a greater degree than most of us thought we could and, perhaps, create impressive new effects. The next step, then, was to see whether we could come up with a trick that exploited similar principles. Lacking an appropriate animal costume, we decided to work on a card trick. After much discussion, and several pilot versions, we came up with a colour-changing deck that fooled some of the most informed card magicians in the world. Paul Harris described it as “the most amazing thing I have seen in years”, and Lance Burton later performed it on national television. So much for the good news.

The deja vu colour-changing deck

By Richard Wiseman & Peter Lamont

Effect
The magician removes a deck of blue cards from its case, places both on the table, then cuts off about half the deck. He turns these cards face up onto the table one at a time, asking the spectator to count the number of red cards. Having dealt all the cards face up, he picks them up, and asks how many red cards the spectator spotted. Whatever the response, he explains there were more red cards than the spectator thought. He then turns the cards face down - the backs are now red.

Method
Eleven blue backed cards are on top of the deck in the following order: black, red, black, red, black, red, red, black, red, red, red. Below these are twenty red-backed cards, the first two of which are red-faced, the rest being a random mix of red and black cards. The rest of the deck are blue-backed, with a crimp below the first of these blue-backed cards. The deck is placed inside a blue card case.

“This is an observation test using some playing cards”.

Remove the deck from the case, and place the case to the right. Cut off above the crimp, and place the bottom section of the deck beside the case. You should be holding face down in your left hand ten blue-backed cards, followed by twenty red-backed cards, with one blue-backed card at the bottom.

“I’m going to deal cards face-up onto the table”

Deal the top card face-up onto the table.

“Your job is to count exactly how many red cards are dealt”

Deal the second card onto the first so that its red face lands as you say “red”.

“Let’s see how well you can do”

Deal the cards face-up one at a time onto the cards already dealt. The cards should be dealt deliberately and briskly so that the audience needs to pay close attention to the task. After the ninth card of the task (not counting the first two cards dealt), the backs of the cards will be red. You will be fully aware of this but the audience will not. At the point of the change, there are several red cards focussing attention on the face-up pile, and the task continues to focus attention there. If they do notice the change, it is because the pace of your dealing is either too slow (so the task requires little effort) or too fast (so they have given up on the task). When you get to the last card, draw attention to fact that it is blue-backed by saying,

“One card left. It has a blue back, is it red?”

Then turn it face up onto the pile of face-up cards.

“So how many red cards did you count? Ten, fifteen? In fact, there are more than that.”

Pick up the cards, squaring them, then fanning them face-up to show the faces. Split the cards between the eleven and twelfth cards from the back i.e. where the blue and red blocks meet, square up the cards in the left hand (the blue-backed cards), and casually drop them on the table face-up.

“All of these cards are red cards!”

Turn a batch of cards face-down with your left hand, showing the red backs, and drop them (unsquared) on top of the face-up cards on the table. Take another batch of cards with the left hand, and turn them face-down, showing their red backs, then drop them onto the table. Do the same with the remaining cards, the last two cards should be kept square so as not to expose the single blue-backed card. When you are finished, the red backs should easily cover the pile of face-up blue-backed cards, and contrast nicely with the cards and card case that were placed to the side at the beginning of the trick.

Now for the bad news. This is not a particularly good trick. As with too many card tricks, the method is more impressive than the effect. Indeed, for magicians, the effect is in the method. What shocked Paul Harris, Jon Racherbaumer, Guy Hollingworth and many others was not that the cards changed from blue to red, but that the red backs had been in full view throughout most of the trick - they had simply not noticed them. Some

thought they had never seen the backs of the cards, others suspected bottom dealing or rough and smooth cards. When they watched the clip again, and realised the red backs had been in full view, some laughed, some swore, and some immediately thought of other applications. Paul Wilson did all three. He and others also compared the method to Charlie Miller's face-up bottom deal, and Jon Racherbaumer later pointed out the link to LePaul's colour-changing deck. However, the visual anomaly of blue to red here is more striking, sufficiently so that when pointed out to them, many magicians found it difficult to believe they had missed it. We suspect the real value of this is in its potential for creating new effects using a method that most magicians would instinctively dismiss as unworkable. In fact, many readers may remain sceptical about whether this works. We can only suggest you try it out. As it is presented as an observation test, and can continue to be presented as such afterwards, you have nothing to lose. If, however, anyone claims to have spotted a gorilla, please contact us immediately.

Collaboration between psychologists and magicians could yield much more, but in a relatively short, exploratory project, there is only so much one can do. In the short time we had, we learned more about the sort of psychology that interests magicians (and the sort that does not), and we feel that many magicians learned aspects of psychology they had not been previously aware of. Already, some have been working on applying awareness of change blindness to new effects, and Paul Harris has created a new effect that relies upon a similar method, one which he previously would not have thought practical. Lance Burton was sufficiently impressed with the trick to perform it on national television, though we should point out it was part of a 'Science of magic' programme, not as an alternative to his dove act. We hope others will experiment, and will let us know how they get on.

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Dr Peter Lamont is an Arts and Humanities Research Board (AHRB) Fellow in the Creative and Performing Arts, University of Edinburgh. Professor Richard Wiseman is head of the Perrot-Warrick Research Unit, University of Hertfordshire.