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The Applied Cognitive Psychology of Attention: A Step Closer to Understanding Magic Tricks

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Summary: Drawing on psychological science, magic provides a unique perspective on applied cognition. Only sparse systematic research, however, documents the thought processes associated with viewing magic tricks. With responses from over 1000 participants, here, we show how individuals construe a classic magic routine wherein a performer appears to vanish a pen. Thirty-four percent of participants correctly identified the key moment of the disappearance with only 11% thereof knowing what actions the magician actually performed to achieve the effect. Our collective findings support what magicians have known for a long time: knowing when a critical maneuver occurs hardly reveals the associated modus operandi. In line with a modern theory of attention, we discuss our results and highlight the interaction between the ***when*** *and* ***where*** *attention modules as a necessary component of applied cognition in ecological settings. Copyright © 2012 John Wiley & Sons, Ltd.*

Over the past decade, empirical studies have increasingly yoked magic—the art of producing illusions by sleight of hand—and cognitive science (Barnhart, 2010; Hergovich, 2004; Kuhn & Land, 2006; Kuhn, Tatler, Findlay, & Cole, 2008; Lamont & Wiseman, 2005; Parris, Kuhn, & Hodgson, 2009; Tatler & Kuhn, 2007; Wiseman & Greening, 2005). Some scholars argue that magic can only serve cognitive science as a methodological tool to, for example, control attention (Lamont, Henderson, & Smith, 2010); others, however, suggest that investigating the techniques leading to the experience of magical effects can contribute to our understanding of psychological processes (Kuhn, Amlani, & Rensink, 2008; Macknik, Randi, Robbins, Thompson, & Martinez-Conde, 2008). Magic provides a unique perspective on applied cognition: magicians fool our perceptual and sensory systems, and scientists are curious to find out the underlying mechanisms (Kuhn, 2010). Although psychologists have shown interest in the study of magic for centuries (Binet & Nichols, 1896; Dessoir, 1893; Jastrow, 1900; Triplett, 1900), formal collaborations between scholars and magicians began only recently. Some accounts involving such joint efforts have been reported in prestigious scientific journals (Kuhn, Amlani et al., 2008; Macknik & Martinez-Conde, 2009; Macknik et al., 2008) as well as in popular science venues (Johnson et al., 2007; Lehrer, 2009; Macknik, Martinez-Conde, & Blakeslee, 2010a; Martinez-Conde & Macknik, 2007, 2008). Thus, cognitive psychologists and neuroscientists are increasingly appreciating the study of magic as a vehicle to elucidate applied cognition (Macknik, Martinez-Conde, & Blakeslee, 2010b).

The magical arts bind attention—one of the oldest and most central issues in psychological science—with applied cognitive psychology (Hyman, 1989; Posner, 2004). Attention involves selecting certain aspects of the physical environment (e.g. objects) or ideas that are stored in a person's memory for active processing (Raz, 2004). By diverting attention, especially visual attention, magicians have long known what researchers are just beginning to uncover—how such acts impact the processing of spatial and temporal information (Raz, 2009). An influential three-network model of attention (Posner & Boies, 1971; Posner & Petersen, 1990; Raz & Buhle, 2006) provides a vehicle to link the art of conjuring with the psychological science of attention (Raz, 2009). This model parses attention into three largely independent modules: alerting (e.g. maintaining high sensitivity to incoming stimuli), orienting (e.g. selecting information from sensory input), and executive attention (e.g. monitoring and resolving conflict among thoughts, feelings, and responses) (Posner, 1994; Posner & Petersen, 1990; Posner & Rothbart, 2007). These control networks separately process information about *when* (alerting) and *where* (orienting) something is happening and monitor and resolve conflict (executive) (Fan, McCandliss, Fossella, Flombaum, & Posner, 2005; Posner & Fan, 2004). The efficiency of each of these largely autonomous control networks is tenuous, moreover, because attention is a finite resource susceptible to interruption and distraction (Lavie, 2005). Magicians, therefore, frequently exploit the inherent shortcomings of attention to mislead spectators (Lamont & Wiseman, 2005; Lehrer, 2009; Raz & Zigman, 2009).

Misdirection is an umbrella term that refers to the various techniques of attention diversion (Fitzkee, 1987). For a long time, conjurers conceived misdirection as a way of diverting their audience away from the method subserving the trick (Nelms, 1969). Preventing the detection of the method, however, often necessitates directing the attention of the spectator elsewhere. Hence, in line with some more recent theorists (Lamont & Wiseman, 2005), here, we refer to misdirection as to directing, rather than misdirecting, the attention of the spectator to a false solution.

Exploring the psychological processes involved in experiencing magical effects may help to elucidate human cognition (Kuhn, Amlani et al., 2008; cf. Lamont et al., 2010;

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Macknik et al., 2008). In the present study, we probed how individuals explain a classical conjuring routine involving the vanishing of a pen in order to identify the cognitive factors involved in the perception of this effect. We hypothesized that knowing the timing of the critical maneuver would be essential, but not sufficient, to identify the *modus operandi* of the illusion. Specifically, the independence of attention networks may allow magicians to direct the attention of spectators at the critical moment (i.e. alerting network) to an irrelevant event (i.e. orienting network). Coupling the critical moment to an irrelevant event, in turn, may lead spectators to adopt an incorrect explanation. We further hypothesized that the generation of an initial explanation of the observed effect would potentially hinder subsequent consideration of alternative cognitive constructions. To test our hypotheses, we used an online survey involving an embedded video vignette featuring a magician who appears to vanish a pen.

METHODS

Participants

Participants were mostly students from McGill University, Montreal, Canada, recruited via classes, course forums, the participant pool system in the psychology department, and the psychology electronic bulletin board. The remaining participants were friends and acquaintances of the former group. One thousand and three individuals completed the survey. Participation was anonymous and voluntary with participants receiving no monetary compensation. Some participants completed the survey for course credit.

Materials

Survey

To probe certain cognitive parameters, we used the open source LimeSurvey® online application tool with eight demographic questions, an audiovisual clip, and 14 specific questions (for online and paper versions of the survey, please see http://tinyurl.com/psychofmagiceng and Appendix, respectively). Participants provided two explanations for the trick alongside a confidence rating on a 5-point Likert scale (1 = not at all; 5 = extremely)—once at the beginning and once at the end of the survey. After providing an initial explanation for the trick, participants went on to answer a set of questions which allowed them to ponder alternative explanations. Most questions had a multiple-choice (closed) format. We set the video on a continuous replay.

Audiovisual vignette

A 15-second mute video clip displayed a magician holding a pen and then seemingly breaking it only to reveal, upon opening his hands, that the pen has vanished (Figure 1 highlights the sequence of events). Although magicians can achieve this effect in different ways, a subtle visual cue divulged that the magician in the video clip used one specific method. Specifically, at counter stamp 4:15, this critical event defines the precise moment when the pen leaves the hands of the performer.

Data analysis

We performed all statistical analyses with Statistical Analysis Software version 9.2 (SAS Institute, Cary, NC). We explored and analyzed the data by using descriptive statistics and frequency distributions. We tested the statistical significance of the continuous variables with the Student's t test. We compared categorical variables such as the indication of the critical time and the indication of the critical event by using χ^2 test and Fisher's exact test, as appropriate. We performed linear and logistic regression analyses to determine the predictors of the independent variables (e.g. correctness of the revised explanation, changing the revised explanation). Analyses included all responders, and we adjusted all regressions for factors that may have influenced responses (e.g. magic knowledge, having seen the trick before, claiming to know how the trick is done).

An experienced professional magician rated each explanation provided for the trick on a scale of 1 (i.e. clueless) to 5 (i.e. complete grasp of the method). To assess the reliability of his ratings, another seasoned magician rated the explanations, and the evaluation scores strongly correlated ($r = .843$). We classified explanations with scores of 4–5 as correct and deemed explanations scoring 1–3 as incorrect. In addition, we categorized explanations based on whether respondents correctly indicated the critical event. We considered responses spanning the counter range 4:15–5:00 as identifying the correct time.

RESULTS

Descriptive statistics

Age of respondents spanned 13–90 years ($M = 22.2$; $SD = 6.6$) with 31% men and 69% women. One hundred and forty-four (14%) respondents reported that they had previously seen the trick, with 32 (22%) thereof claiming to know how magicians perform it. Although 141(14%) respondents thought that they knew the method of the trick, only 52 (37%) of those provided a correct revised explanation. Furthermore,

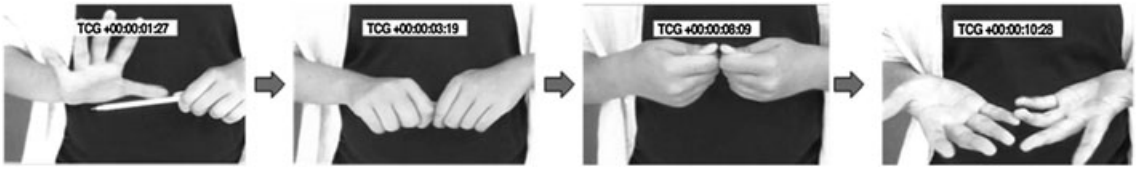

Figure 1. Sequence of events

only a minority (11%) of the 282 (34.2%) respondents who correctly indicated the critical time of the pen vanish provided a correct explanation. Six hundred and forty-two (64%) respondents did not change their initial explanations, whereas only 49 (5%) respondents provided a correct revised explanation.

Confirmatory analyses

Correctness of explanations

We conducted a logistic regression to assess whether the indication of the critical time (yes, no) was associated with the correctness of the revised explanation (correct, incorrect). We adjusted this regression for sex, age, magic knowledge (1, 2, 3, 4, 5), having seen the trick before (yes, no), claiming to know how the trick is done (yes, no), first confidence score (1, 2, 3, 4, 5), correctness of the initial explanation (correct, incorrect), and detection of the critical event (yes, no). Analysis of these data revealed that the identification of the critical time significantly increased the likelihood of providing a correct explanation (Table 1).

Changing the explanations

We conducted a logistic regression to assess the impact of the first confidence score (1, 2, 3, 4, 5) on whether participants changed their initial explanations. We adjusted these analyzes for sex, age, magic knowledge (1, 2, 3, 4, 5), having seen the trick before (yes, no), claiming to know how the trick is done (yes, no), correctness of the initial explanation (correct, incorrect), detection of the critical time (yes, no), and detection of the critical event (yes, no). Analysis of these data showed that higher first confidence scores were associated with increased likelihood of keeping the initial explanation (Table 1).

Exploratory analyses

Confidence scores

In order to assess which factors influenced the First Confidence Score (1, 2, 3, 4, 5), we conducted a linear regression. Correctness of the initial explanation (correct, incorrect) was the main predictor where we assumed that correct explanations should yield in higher confidence scores. We adjusted the regression for sex, age, magic knowledge (1, 2, 3, 4, 5), having seen the trick before (yes, no), and claiming to know how the trick is done (yes, no). Analysis of these data revealed that both higher knowledge of magic and claiming to know how the trick is done predicted higher first confidence scores (Table 1).

We further conducted a linear regression to assess which factors influenced the second confidence score (1, 2, 3, 4, 5). The main predictors were detection of the critical time (yes, no), first confidence (1, 2, 3, 4, 5), correctness of the initial explanation (correct, incorrect), same explanation (yes, no), and correctness of the revised explanation (correct, incorrect). We adjusted this regression for sex, age, magic knowledge (1, 2, 3, 4, 5), having seen the trick before (yes, no), and claiming to know how the trick is done (yes, no). Analysis of these data

Table 1. Standard regression table

	Correctness of revised explanation (correct = 1, incorrect = 0)	Changing the explanation (same = 1, different = 0)	1st confidence score	2nd confidence score
	Odds ratio	Odds ratio	*b*	*b*
Critical time	6.41***	.86	—	−.09
	(3.56)	(0.14)		(0.07)
1st confidence score	.90	1.82***	—	.59***
	(0.20)	(0.15)		(0.03)
Correctness of initial explanation	638.11***	4.08	.41*	.33
	(554.06)	(3.12)	(0.20)	(0.27)
Detection of the critical event	9.06***	1.16	—	.35*
	(4.83)	(0.48)		(0.18)
Same explanation	—	—	—	−.14*
				(0.07)
Correctness of revised explanation	—	—	—	.88***
				(0.21)
Magic knowledge	1.71*	.95	.19***	.08*
	(0.44)	(0.08)	(0.04)	(0.04)
Seen the trick before	.76	1.18	.06	.04
	(0.55)	(0.25)	(0.09)	(0.09)
Claim knowing how the trick is done	.54	1.53	1.20***	.17
	(0.38)	(0.41)	(0.04)	(0.10)
Sex	.30*	.97	−.09	−.04
	(0.16)	(0.15)	(0.07)	(0.07)
Age	1.05	1.02	.01*	0.01*
	(0.03)	(0.01)	(0.005)	(0.005)
R^2	0.58	0.09	0.21	0.38
DF	9	9	6	11

Note: Standard error in parentheses.
*$p \leq .05$;
***$p \leq .001$.

showed that higher knowledge of magic, higher first confidence scores, detection of the critical event, and a correct revised explanation predicted higher second confidence scores. In addition, compared with younger respondents, older individuals were more likely to score higher on the second confidence. Respondents who kept their initial explanation, moreover, had lower second confidence scores than those who changed their explanations (Table 1).

Detection of the critical time and of the critical event

We performed a χ^2 test to assess the association between indication of the critical time (yes, no) and of the critical event (yes, no). Analysis of these data showed that respondents who indicated the correct time were increasingly more likely to report seeing the critical event ($\chi^2(1) = 50.49$, $p < .0001$).

DISCUSSION

In this study, we probed how applied cognition, via distinct networks of attention, influences the way individuals construe a specific illusion—the vanishing of a pen (Figure 1). In line with our hypothesis, correctly identifying the critical time (alerting attention network) was an essential but insufficient ingredient of a correct explanation. Knowledge of the critical time, for example, increased the likelihood of identifying the elements required for the effect (e.g. elastics, safety pins; Figure 2) as well as of uncovering its method (Table 1). Nonetheless, although identification of the critical time characterized individuals who provided a correct explanation (Figure 3), only 11% of respondents who reported the correct timing uncovered the *modus operandi*. Detection of the critical event (orienting attention network), however, contributed to the ability of unraveling the method. Our findings, therefore, suggest that a cogent explanation of such illusions requires an interaction between the *when* and *where* attention modules.

Because the alerting and orienting attention systems are relatively independent (Fan, McCandliss, Sommer, Raz, & Posner, 2002; Fernandez-Duque & Posner, 1997), magicians may use diversion techniques to prevent these networks from interacting. Influencing the executive network (e.g. leading the audience to wrong expectations) may be one way to prevent the occurrence of such interactions. Salient stimuli including large movements easily capture attention (Abrams & Christ, 2003; Cole & Liversedge, 2006; G. Kuhn & Tatler, 2010; Lehrer, 2009; Raz & Buhle, 2006; Robbins, 2007; Wolfe & Horowitz, 2004); magicians often use such maneuvers to direct the gaze of the spectator away from some key features (e.g. overt misdirection in Macknik et al., 2010a, 2010b; Martinez-Conde & Macknik, 2008). Furthermore, people tend to ascribe intentions to and create expectations about movements of others (Arbib & Mundhenk, 2005; Ricciardelli, Bricolo, Aglioti, & Chelazzi, 2002; Rizzolatti, Fogassi, & Gallese, 2001; Teller, 2007). In the vanishing pen illusion, seeing the magician going through the motion of breaking the pen likely contributed to the distraction. Knowing that magicians use misdirection to achieve a certain effect, moreover, seems insufficient for understanding how they exploit this technique. Respondents who provided an incorrect explanation, for example, were as likely as respondents who provided a correct explanation to indicate that the magician used misdirection to achieve the effect (Figure 4).

Belief formation may alter the way individuals interpret subsequent information in a way that leads to belief perseverance (Nickerson, 1998). In our study, the majority of respondents (64%) did not change their initial explanations, although fewer than 5% knew the *modus operandi*. In addition, higher confidence scores were associated with an increased likelihood of keeping the same explanation (Table 1). These findings suggest that the more confident respondents were, the more likely they were to use the questionnaire as a means to confirm rather than question their initial explanation. In fact, people are prone to assign more weight to information that confirms their beliefs while discounting the evidence against them (i.e., confirmation bias) (Dawson, Gilovich, & Regan, 2002; Jonas, Schulz-Hardt, Frey, & Thelen, 2001; Nickerson, 1998). Believers in paranormal phenomena, for example, tend to view pseudo-psychic demonstrations as examples of such experiences even when being explicitly told that they will see a trick (Hergovich,

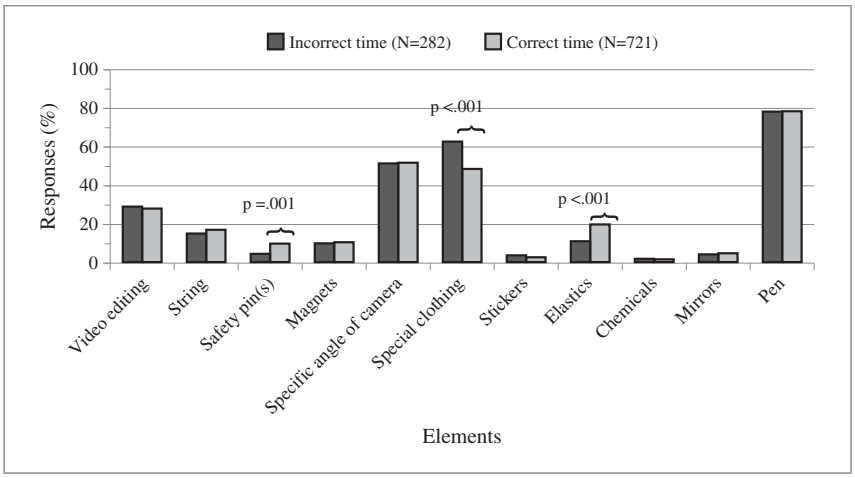

Figure 2. Distribution of the elements that respondents thought to be essential to performing the trick as a function of indicated time of the pen vanish

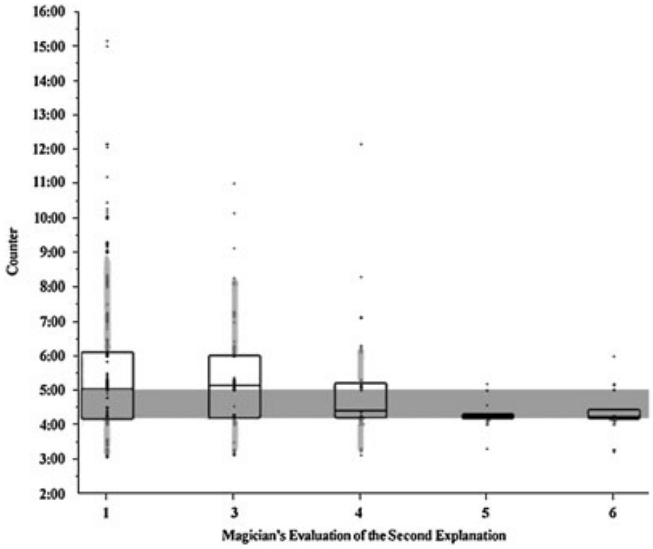

Figure 3. Distribution of the magician's evaluation ratings: revised explanations as a function of indicated time of the pen vanish ($N = 282$). Each dot represents an individual response; box plots show the lower quartile, the median, and the upper quartile of the distribution of responses; vertical gray lines span min–max within the 1.5 interquartile range; the horizontal gray line highlights the time range defining the critical time

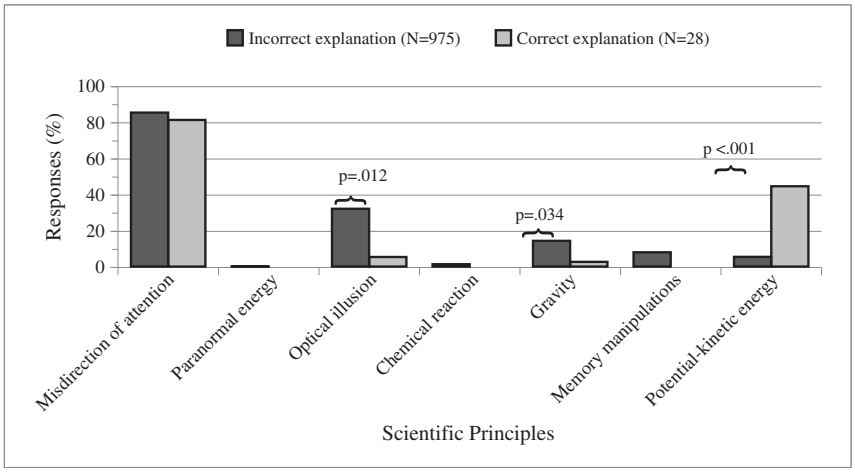

Figure 4. Distribution of the scientific principles as a function of indicated initial explanation

2004). In addition, solutions to a problem that come to mind first may limit attention resources available for considering alternative possibilities (Bilalic, McLeod, & Gobet, 2008). In our study, respondents who provided an incorrect initial explanation were less likely to identify the elements essential to achieve the effect (e.g. elastic, safety pin) than those who supplied the correct explanation (Figure 5). Thus, the first explanation that respondents generated likely operated as a blockade for considering alternative solutions.

Our collective findings suggest that the effect of the vanishing pen illusion hinges on common psychological processes including attention, expectations, and belief perseverance. Accordingly, the theoretical literature on magic suggests that these processes are closely interlinked in conjuring routines (Macknik et al., 2010b). Knowledge and expectations can modulate our perception (O'Regan & Noë, 2001; Ramachandran, Armel, Foster, & Stoddard, 1998). The visual system, for example, resolves the ambiguities of sensory input by filling in the gaps with familiar patterns; the automaticity of this process allows magicians to exploit it in a variety of illusions (Barnhart, 2010; Kuhn & Land, 2006). The focus of attention, however, may be more important than the exact location of gaze (Deubel, Clark, & Rensink, 2000; Simons & Chabris, 1999). In covert misdirection, for example, the observer can be looking directly at the method while being unaware of it (Kuhn & Findlay, 2010; e.g. Kuhn & Tatler, 2005; Kuhn, Tatler et al., 2008; Macknik et al., 2008; Martinez-Conde & Macknik, 2008; cf. saccadic vs. smooth pursuit eye movements in overt misdirection, which also play a differential role on the spotlight of attention; Otero-Millan, Macknik, Robbins, & Martinez-Conde, 2011). Further investigations of magic may pave the road to a better understanding of such cognitive processes.

Prospects in the study of magic

Lamont et al. (2010) argue that magic is not unique in that it exploits psychological processes that may occur in a wide range of other contexts and hence that a science of magic is unwarranted. Investigations of magic, however, may lead to the

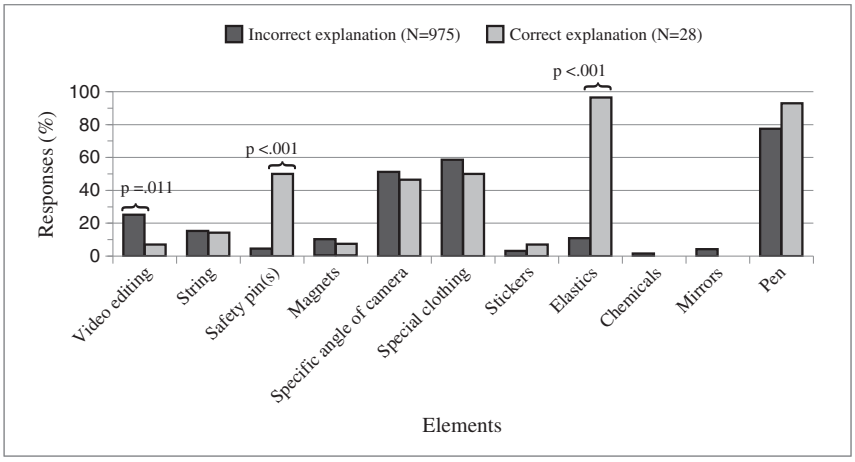

Figure 5. Distribution of the elements that respondents thought to be essential to performing the trick as a function of indicated initial explanation

development of new paradigms in which careful operationalizations of cognitive and perceptual processes result in a specific outcome or experience. Johansson, Hall, Sikström, and Olsson (2005), for example, used sleight of hand to substitute photographs that participants chose as more attractive with those that they deemed less attractive; this paradigm demonstrated the robustness of the choice blindness effect, with participants often failing to notice the substitution. Conjuring, moreover, may provide new leads for the use of deception—a common, albeit ethically tenuous, methodology (Bortolotti & Mameli, 2006; Clarke, 1999; Pascual-Leone, Singh, & Scoboria, 2010; Sharpe, 1992). Magic may allow the experimenter to effectively mislead the participant without lying (Lamont et al., 2010)—an attractive way to apply deception in research.

Thomas Kuhn (1962) has argued that paradigm changes denote the advancement of science. New paradigms usually arise as a response to the awareness of flaws in an already existing paradigm. Scientists, however, often take ideas and concepts for granted and, therefore, may be blind to such inconsistencies. Hence, substantial exposure to a new paradigm is essential before its acceptance. Incorporating the theory and practice of magic into research may shed new light on psychological mechanisms such as attention. Specifically, because researchers and magicians uphold different conceptions of attention, communication between both experts may be essential (Bohm & Peat, 1987). To illustrate the difference between these specialties, Raz and Zigman (2009) drew an analogy between magicians and watchmakers. Although watchmakers are knowledgeable about the mechanics of keeping time and repairing timepieces, they are unlikely to consult about the meaning of the time itself. Similarly, magicians are experts in attention control, but they hardly show knowledge of its underlying mechanisms. Thus, a dialogue between scientists and magicians may fuse different ways of conceiving cognitive processes, thereby providing new perspectives on human psychology.

CAVEATS

Limitations of the web-based survey

Online research is increasingly popular because of explosive growth in the number of individuals with access to personal computers and Internet (Birnbaum, 2000, 2004). Ecologically, most young people in the developed world consume entertainment, including magic, by watching videos on the web (Amichai-Hamburger, 2002; Hoffman, Novak, & Venkatesh, 2004). Online research, moreover, contributes to ecological validity by excluding the experimenter, whose presence can affect responses, and enhancing automation (Kraut et al., 2004). In addressing the relative merits and drawbacks of Internet surveys, we refer the reader to a special issue in *Public Opinion Quarterly* (Couper & Miller (Eds.), 2008).

The advantages of web-based surveys are multiple: they are expedient, allowing for efficient data collection and timely results; they permit casting a wide net while reducing the cost relative to the sample size (Dillman, 2000); they eliminate the need for a full mailing address and thus provide respondents with a guarantee of anonymity (Eysenbach & Wyatt, 2002). Consequently, respondents benefit from social advantages such as an increased willingness to answer charged (e.g. socially threatening) questions (Pealer, Weiler, Pigg, Miller, & Dorman, 2001) as well as a reduction, or elimination, of social desirability effects (Couper, Tourangeau, & Steiger, 2001). This feature is of special importance when addressing questions involving the confidence of respondents on a particular issue.

One of the disadvantages of web-based surveys concerns the exclusion of responses from individuals without Internet access, thereby introducing coverage error (Couper, 2007). The number of people with Internet access, however, is growing exponentially (Birnbaum, 2000, 2004), suggesting that the coverage error is getting smaller. Furthermore, in any survey, including a web-based survey, respondents differ from the non-respondents in terms of demographics and attitudes resulting in non-response error (Umbach, 2004). Nonetheless, research reports comparing Internet and mail survey methodologies suggest that differences between responders and nonresponders are likely small (Sax, Gilmartin, Hagedorn and Lee, 2008). In addition, this literature contains no account of response bias based on demographic characteristics. Although women outnumbered men in our sample, such bias likely reflects the imbalance of the distribution between the two sexes in the psychology department.

Finally, web-based surveys are susceptible to multiple completions by the same person (i.e. 'ballot stuffing'). We have implemented certain technological measures, such as the use of cookies and IP addresses, to avoid duplicate responses (Couper, 2007).

Limitations of the trick used

Magicians usually perform in person rather than on screen. On the other hand, an edited video stripped of many social cues enhances experimental control and ensures that all participants view the same stimuli. In addition, making the trick available online permitted tapping a large number of participants. Other limitations concern the clip itself, which displayed an example of minimalist magic where the spectator could see only the hands of the magician. Hence, the routine was bare of elements such as eye contact, body language, voice, and a demonstration that the magician is using an ungimmicked pen—features that magicians usually use to enhance the effect (Lamont & Wiseman, 2005). Recent research findings suggest, however, that such social cues—often presumed to operationalize critical aspects of magic—may be less important than heretofore acknowledged (Cui, Otero-Millan, Macknik, King, & Martinez-Conde, 2011).

CONCLUSION

Our findings suggest that decoupling the *when* and the *where* attention modules may play an important role in creating magic effects. These findings support the evidence that alerting and orienting networks are relatively independent (Fan et al., 2002). Furthermore, our findings show that the formulation of an initial explanation may hinder the problem-solving process. Although the representativeness of our sample may be biased and generalizing to other magic effects may be difficult, we believe that our findings capture meaningful characteristics of human cognition that may be of general interest. Studying cognitive processes that accompany the experience of a magical effect may pave the road to an ecological way of investigating psychological processes such as attention and belief formation. The study of conjuring routines can broaden the armamentarium of the experimental psychologist with empirical and theoretical knowledge to better understand applied human cognition.

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APPENDIX
SURVEY

1. Sex:
- Female
- Male
2. What is your mother tongue?
- English
- French
- Other:_____

3. Please indicate your age in years (e.g., 18, 35, 76): _____
4. Highest education reached:
- High school
- Post high school (CEGEP, vocational school, community college, etc.)
- College/university
- Post graduate (Master's, PhD, etc.)
- Other:_____
5. Please state your line of study/work: (e.g., high school student, undergraduate student, secretary, car mechanic): _____
6. Please provide descriptions of your ethnicity/race/culture (e.g., *Chinese, French-Canadian, Jewish, black*, etc.): _____
7. What country do you associate with most closely? _____
8. How knowledgeable are you about magic? (1 = not at all/ 5 = extremely)

*****VIDEO OF THE TRICK******

9. Have you seen this trick before?
- Yes
- No
10. Do you think you know how magicians perform this trick?
- Yes
- No
11. Regardless of your answer to the previous question, please explain how magicians may perform this trick: _____
12. How confident are you of this explanation? (1 = not at all/5 = extremely)
13. Do you think video-editing is *necessary* to achieve this effect?
- Yes
- No
14. Please re-watch the first video and indicate the exact time the pen leaves the magician's hands.
Kindly use the *last 4 digits* of the TCG timer.
(e.g., *if you think the pen is no longer in magician's hands*
at TCG + 00:00:12:17, your answer should be 1217)
The answer to this question should be in the range of 0310 and 1530.
15. If you were to perform this trick, choose the elements that you would need: *(check any that apply)*
- String
- Safety pin(s)
- Magnets
- Specific angle of camera to create optical illusion
- Special clothing (i.e., certain color, with pockets)
- Stickers
- Elastics
- Chemicals
- Mirrors
- Pen
- Other:_____
16. What psychological or scientific concepts are at work? *(check any that apply)*
- Misdirection of attention
- Paranormal energy
- Optical illusion (i.e., the pen is still there)
- Chemical reaction
- Gravity
- Memory manipulations
- Changing potential energy into kinetic energy
- Other:_____
17. Please check the statement(s) that you believe to be TRUE: *(check any that apply)*
- The magician is using a genuine pen.
- The pen actually breaks.
- The magician drops the pen below the camera's frame.
- This special pen dissolves upon contact with heat from magician's hands.
- The magician conceals this collapsible pen between his fingers.
- None of the above.
18. Please provide an estimate of how many times you watched this video:_____
19. Given all that has transpired since your initial explanation/ speculation regarding the trick, are you still comfortable with your original stance?
- Yes
- No
20. Please provide a revised/detailed explanation of this first trick:_____
21. How confident are you of this explanation? (1 = not at all/5 = extremely)