Artifice System Handbook

A guide to designing deceptive action

artifice

www.artifice.co.uk

Artifice System Handbook

A guide to designing deceptive action

Simon Henderson, Artifice Ltd

Table of contents

Foreword

This handbook is intended to help practitioners that have a professional requirement to fool others to be more effective in their jobs. Used in conjunction with the Artifice course programme, the handbook seeks to empower its readers to become better at 'deceptive thinking', enabling them to out-think, intellectually out-gun, and out-manoeuvre their targets in highly adversarial settings. It represents thinking accumulated over the course of nearly fifteen years of research into the fundamental nature of deception, many years spent supporting deception practitioners across a range of organisations, and a lifelong passion for magic, confidence tricks, and other means for deceiving.

The handbook is deliberately light on theory, and heavy on practice. It is intended to provide a practical means for designing deceptive action that works. For those readers that do want more of the background, the handbook also supplies many references to other work that explains more about how deception works, and the methods used for fooling others in many other domains of application.

The principles and processes described in the handbook transcend domain, application, and hierarchy. This means that the methods can be applied to the design of any form of deceptive action, to fool any type of target (from individual to organisation) within any domain of application. These methods can be used by anybody that needs to design any form of deception - from undercover police officers, military planners, intelligence staffs, advertisers and marketers, fiction writers, theatre designers, magicians, etc., and also by counter-deception practitioners, including police officers, intelligence staff, security personnel, cyber defence staff, customs and anti-smuggling staff, store owners, anti-fraud personnel, etc.

A key consideration in writing a book about deception is the potential use to which these ideas may be put. The book therefore addresses as a primary concern the ethics of deception, illustrating some of the many benevolent applications of deception. It also discusses the means by which deception can be detected and defeated (this topic will be addressed in more detail in a later handbook) together with the means by which the principles in this handbook can be used in a 'poacher turned gamekeeper' mode to support counter-deception. Finally, this handbook provides tools that can help practitioners to develop their deceptive thinking skills throughout their careers.

Simon Henderson
March 2019

“To be human is to cheat and be cheated.”

Bell and Whaley (1982)

Laying the foundation

Introduction

Deception is all around us. It exists at all levels of life, from the microbial to the global-geopolitical, and it confers an evolutionary advantage to both predator and prey. In the short term, deception increases gain, or minimises loss. In the longer-term it confers evolutionary advantage by increasing the chances of survival, maturation and reproduction. Deception is hard-wired into each and every one of us. It can be used benevolently to do wonderful good, as well as malevolently to do incredible harm. Effective deceptive action often has a simplicity, elegance and an almost aesthetic quality of beauty to it. Yet at the same time, by its very nature, deception is not obvious, it is surprising, and the means by which it works is often extremely counter-intuitive. These characteristics can make deception difficult to study, understand and enact.

The intracellular parasitic protozoa Leishmania (sometimes referred to as a 'flesh-eating disease') uses multiple forms of deception to survive and reproduce. Initially, dead parasites expose a molecule that supports the entry of live parasites into cells, thereby evading the host's immune responses and avoiding detection. Once the parasite has entered a host cell, it releases a molecule that prevents the cell from responding to an 'aging trigger' molecule, thereby increasing the cell's lifespan so that it can complete its lifecycle (Cecalio, Perez-Cabezas, Santarem, Maciel, Rodrigues, & Cordeiro da Silva, 2014; Knodler, Celli, & Finlay, 2001).

A wide variety of different plant-based deception occurs, including the use of scent mimicry to attract and predate on insects, such as the western skunk cabbage that mimics the scent of a skunk to attract insects (Broderbauer, Diaz, & Weber, 2012). Visual mimicry can be used to simulate a sexually attractive insect, such as the bee orchid that attracts other insects to mate and facilitate pollination (Jersakova, Johnson, & Kindlmann, 2006; Paulus, 2006; Scopece, Musacchio, Widmer, & Cozzolino, 2007; Streinzer, Ellis, Paulus, & Spaethe, 2010; Streinzer, Paulus, & Spaethe, 2009; Vereecken, 2009). And as a defensive measure, some benign plants mimic other plants that are poisonous or sting, including the dead nettle which resembles a real nettle to deter predators from attacking or eating it (Lev-Yadun, 2016; Schaffner, 1910).

Deception is widespread in the animal kingdom, and can be seen across all phyla. Deception may be visual, including various forms of camouflage or mimicry, such as a bird that displays a simulated broken wing to lure a predator away from its ground-nestling chicks (Hiller, 1989). Some animals, such as drongos use false alarm calls to scare other species away from food that they then steal (Flower, Gribble, & Ridley, 2014). And shortly before they become highly vulnerable as a result of moulting, Mantis Shrimps will physically threaten other Mantis Shrimps to

establish a reputation for aggression, which they then capitalise on by maintaining bluff threat displays before their exoskeletons have hardened (Adams & Caldwell, 1990).

In humans, children learn to lie at an early age (Evans & Lee, 2013; Sinclair, 1996). However, the transition from being a poor liar to a better liar reflects development of the capacity for imagining the world from another person's (i.e. the target's) perspective, a process known as 'theory of mind'. This phase of development marks a key stage in a child's acquisition of higher-level cognitive reasoning skills (Ding, Wellman, Wang, Fu, & Lee, 2015; Spence, Hunter, Farrow, Green, Leung, Hughes, & Ganesan, 2004). Studies have also shown a positive link in young children's ability to deceive, and their subsequent academic development (Evans & Lee, 2011; Lee & Ross, 1997) and a related relationship between deceptive ability and brain size has also been identified in primates (Byrne & Corp, 2004).

There exists a significant industry built around the purported (if scientifically questionable) ability to detect lying in humans, often linked to a range of claimed enabling technologies, from the polygraph (which uses heart-rate analysis, galvanic skin response, respiration patterns, and other analysis), micro-gesture detection and analysis, speech pattern analysis, through to functional magnetic resonance imaging (Ekman, 1985; National Research Council Committee to Review the Scientific Evidence on the Polygraph, 2003).

Deception enables the practice of social engineering, in which a fragment of information obtained about an organisation (for example, the name of an employee) is used to manipulate employees within that company in an iterative and escalatory cycle to gain increasing levels of information, privilege and access (Long, 2008; Mitnick & Simon, 2002).

Deception similarly facilitates many different forms of scam and confidence trick, in which a mark's confidence and trust is first gained, and then exploited by a swindler, usually resulting in a loss of money or goods (Lovell, 1996; Stajano & Wilson, 2009).

Deception permeates advertising and marketing, giving rise to phenomena such as brand mimicry, misleading packaging and labelling, advertising that targets children in the form of free online games (known as 'advergames') and apparent low-budget parody adverts produced as tributes by a product's fans, that in fact have been commissioned from large marketing firms - a genre of advertising known as 'sub-viral' (Boush, Friestad, & Wright, 2009; Shrum, Liu, Nespoli, & Lowrey, 2012).

Deception exists in sport, both as an inherent and legitimate tactic (e.g. a boxer throwing a feint, or trick plays that utilises mimicry and misdirection such as the

'Statue of Liberty' play in American Football) and also in the form of cheating, such as covert doping or manipulation of equipment (Morris, 2013; Pfleegor & Roesenberg, 2013).

Within the psychic industry, books teach manipulative linguistic strategies that enable a purported psychic to pass on messages that are so personal and so accurate that they can only (apparently) have been passed-on directly from a dead relative (Hyman, 1977; Rowland, 2008).

The field of magic and conjuring exploits deception to fool audiences for entertainment, and while there are limits to the generalisability of magic, magicians are one of the few classes of deceiver that actively document their methods, and magic books contain a wealth of information about how people are fooled (Lamont & Wiseman, 2005; Macknik, Martinez-Conde, & Blakeslee, 2011).

Deception enables many different forms of cheating in the context of gambling, from physical and psychological moves designed to misdirect a croupier from an exchange of low-value chips for high-value chips during a game of roulette, to reprogramming a casino's gaming computer to erroneously print winning pay-out slips (BBC, 2010; Marcus, 2005; Ortiz, 1984). Deception is also used within gambling as an acknowledged and legitimate tactic, such as the use of bluffing in poker (Palomäki, Yan, & Laakasuo, 2016).

There exists an extremely long and rich history of deception as a military strategy, to enable surprise, simulate increased force size, and confuse the enemy as to real capabilities or intentions (Tzu, 500 B.C.; Whaley, 2007).

Deception occurs in music, where a listener's expectations about the progression of a chord sequence may be deliberately set-up, and then unexpectedly violated using an irregular resolution to create surprise and interest (a dominant to superdominant chord progression known as a 'deceptive cadence') (Foote & Spalding, 1905, pp. 68-69).

The world of art employs deception to surprise, delight, frustrate, confront and confound observers and participants. Trompe-l'œil (French for "deceive the eye") employs photo-realistic optical illusions to fool viewers into believing momentarily that they are viewing real three-dimensional objects, such as a door or a window painted onto a wall, or a figure in a painting that appears to extend beyond the painting's frame (Kubovy & Tyler). Performance artists may also stage events such as pranks, protests or other forms of public or corporate intervention, without the unwitting participants involved being aware as to the real identify of the artist, or that they themselves are participating in a work of art (Reeves-Evison, 2016). And deception is rife in art fraud, in which the works of great artists are painstakingly and accurately falsified with the intent to fool expert authenticators, auctioneers and bidders (Hebborn, 2004).

The authors of works of fiction often deliberately manipulate and deceive their readers. Storylines plant explicit or implicit clues designed to shape the reader's sensemaking and expectations as to whodunit, only to confound these with the sudden twist at the story's conclusion as to who really did it (Shipley, 1953).

Special effects designers employ deception to create false but convincing visual representations of real world or imaginary activities that are too expensive, too risky, or too technically prohibitive to do for real. And realistic special effects capabilities are also enabling other deceptive activities, such as hiding a perpetrator's real identity during a bank robbery (Sanders, Ueda, Minemoto, Noyes, Yoshikawa, & Jenkins, 2017).

And as cyberspace and cyber conflict continues to develop apace, new capabilities and new forms of deception are emerging that rely on the ability to create, manipulate and exploit behavioural residue, exploit anonymity, automation and permutation, and achieve global reach and massive asymmetry. Such capabilities have given rise to exotic terminology including 'astroturfing' (the creation of artificial grass roots support), 'sock-puppeting' (the creation of one or more online personas to engineer false dialogue) and 'googlewashing' (changing the apparent meaning or significance of a search term by pushing specific results up the rank ordering and causing the original results to appear lower-down in the ranking). See Lee (2010); Livingston (2005); Orlowski (2003); Solorio, Hasan, and Mizan (2013); Stajano and Wilson (2009); Zibreg (2013).

From this long list of domains one can begin to appreciate the vast range of applications in which deception is practiced to fool a target and create some kind of advantage for the deceiver. And it is worth bearing in mind that the domains discussed here barely begin to scratch the surface of the totality of settings in which deception is utilised. But what links these examples together? What are the common threads? How can one begin to relate the deceptive mechanisms used by Leishmania to the deceptive strategies used in sockpuppeting? How can deception as practiced on the sports field help us make better sense of deception when it is used to cheat at the roulette table? And how can the study of deception within these domains assist a practitioner that needs to deceive others in an entirely unrelated domain?

An important foundation for answering these questions is to first define our terms!

Defining key terms

The Oxford Dictionary of English (Oxford English Dictionary, 2016) defines deception as:

"[To] deliberately cause (someone) to believe something that is not true, especially for personal gain."

This definition, which is typical of those derived from dictionaries, falls short in several respects. First, it implies that truth or falsehood is a binary either-or state, and does not, for example, address varying degrees of truth, or the case in which parts of a situation are true, while other parts are false. Second, the definition does not cater for situations in which one wishes a target to not believe a situation that is true; the definition therefore fails to cater for situations in which reality is being hidden or actors are operating covertly. Third, it is entirely feasible to deceive a target without telling any lies whatsoever, indeed the truth itself can be structured and presented to deceive (a process sometimes referred to as 'paltering').

Other definitions fair somewhat better. For example, current UK deception doctrine, JDP 3-80.1 (DCDC, 2007) defines deception as:

"Deliberate measures that manipulate the perceptions and condition the behaviour of the adversary, in order to achieve and exploit an advantage."

While this definition introduces psychological processes and their manipulation (perception, behaviour, manipulation and conditioning) close inspection reveals that it is not specific to deception; indeed, it could just as well be a definition for 'influence'.

Another common component of definitions of deception is that the action of the target is often specified as being prejudicial to their interests. For example, the US Department of Defense Dictionary of Military and Associated Terms (Staff, 2007) defines deception as:

"Those measures designed to mislead the enemy by manipulation, distortion, or falsification of evidence to induce the enemy to react in a manner prejudicial to the enemy's interests."

While this definition is recognisably military and adversarial in nature, it does not constitute an adequate basis for a definition of deception in general, as there are many instances in which deception is used for benevolent purposes that are not prejudicial to the target's interests. For example, a medicine may be flavoured to fool a patient's sense of taste into finding it palatable, in order that he can ingest it to receive its benefits.

A new definition is hereby proposed, a definition that seeks to address these concerns, and sets the notion of deception against a more contemporary psychological foundation (Henderson, 2011):

Deception:
"Deliberate measures to induce erroneous sensemaking and subsequent behaviour within a target audience, to achieve and exploit an advantage."

A key component of this definition relates to the notion of 'erroneous sensemaking'; that is, some aspect of the target's understanding of the world is deliberately led to be wrong, or in error. It is this focus on error that differentiates deception from other related concepts, such as influence, persuasion or coercion, etc., and indeed influence more broadly. The notion of sensemaking will be addressed later in the paper, as a fundamental building block of deception. Figure 1 unpacks this definition and explains its different components.

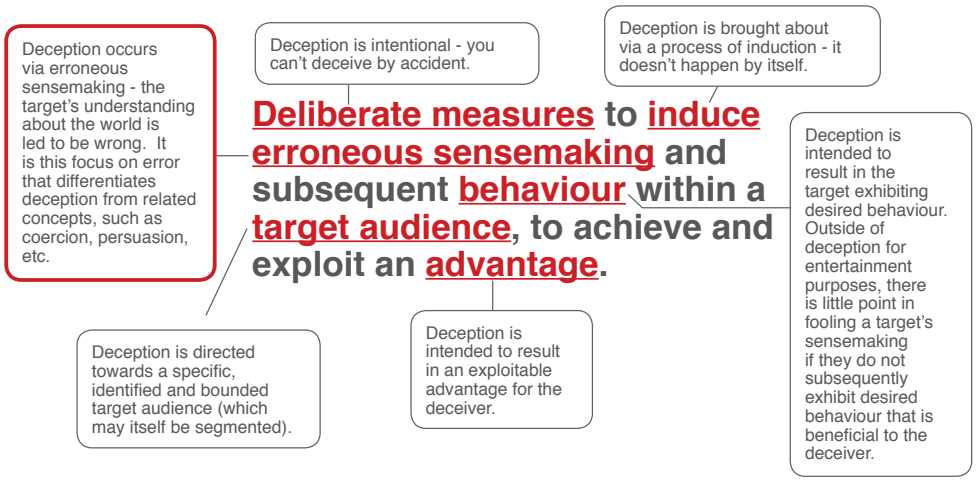
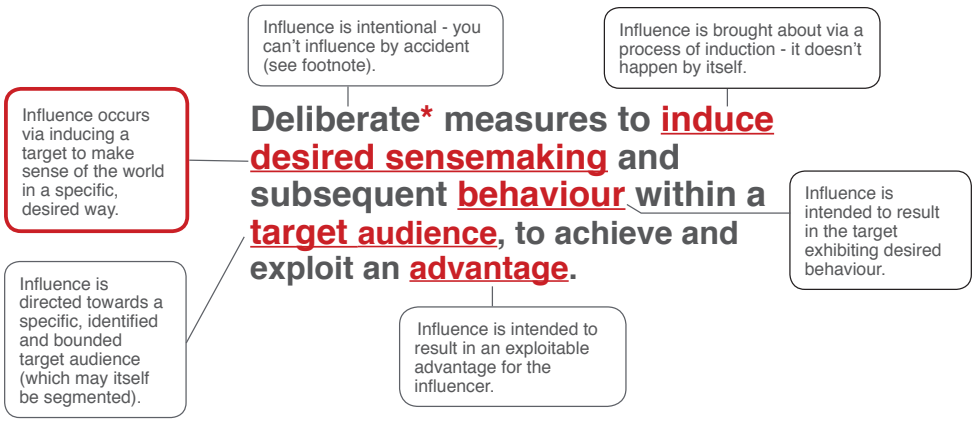


Figure 1 - Unpacking the definition of 'Deception'

This definition differentiates deception from influence via the inclusion of erroneous sensemaking. Turning to a definition of influence:

Influence:
"Deliberate measures to induce desired sensemaking and subsequent behaviour within a target audience, to achieve and exploit an advantage."

Note difference between 'desired sensemaking' here, versus 'erroneous sensemaking' in the definition of deception. The definition of influence is similarly unpacked in Figure 2.



* This definition refers to influence that is conceptualised and executed as a deliberative strategy for bringing about desired behaviour change in a target audience. Note also that influence *may* arise unintentionally, and result in outcomes that are disadvantageous. Such issues should be addressed as part of the risk management process.

Figure 2 - Unpacking the definition of 'Influence'

Deception is therefore a class of influence, as depicted in Figure 3.

Figure 3 - Deception is a class of influence

Both involve influencing a target to engage in desired behaviour, however, deception is characterised specifically by its generation of desired behaviour through the induction of erroneous sensemaking. Influencing a target does not require that its understanding of the world is wrong. For example, a target may be incentivised to change its behaviour by receiving a payment. In this case, the target has been influenced to change its behaviour through correctly making sense of the reward offered, and no deception is involved.

The Influence-Deception Principle
All deception involves influence, but not all influence involves deception.

The notion of a 'target audience' has also been introduced in both of these definitions. The term 'target' and 'target audience' are used synonymously throughout this handbook, although 'target' is generally preferred for brevity.

A target is:
The actor(s), or system(s) that constitute the aim of an influence or deception activity, within which behaviour change is sought.

An influence or deception target may comprise an individual, a group, an organisation, a segment of a larger populous, and potentially even higher levels of human collective, such as a state. A target may also comprise any system that exhibits some form of behaviour, and within which behaviour change may be sought, such as a computer system, algorithm, etc. An approach to conducting Target Audience Analysis (TAA) is presented in 'Target Audience Analysis for deception' on page 61.

The goal of deception - Planned Behaviour Change

"Indiana Jones plays no role in the outcome of the story. If he weren't in the film, it would turn-out exactly the same."
Amy, The Big Bang Theory, Season 7, Episode 4, 'The Raiders of Minimization'

Deception seeks to change future outcomes to the benefit of the deceiver. Specifically, deception is directed towards changing a target's behaviour to the deceiver's advantage.

Behaviour comprises:
Any activity that can be seen by an external observer.

Desired behaviour change may involve wanting the target to:
1. Stop their current behaviour.
2. Start a new behaviour.
3. Switch from their current behaviour to a different new behaviour.
4. Continue a current behaviour they would otherwise stop or change (i.e. to conduct 'business as usual').
5. Not start a new behaviour that they otherwise would.
6. Speed-up a current behaviour.
7. Slow-down a current behaviour.

The focus and necessity for deception to bring-about behaviour change within a target is captured in the 'Indiana Jones Principle', relation to the quotation above:

The Indiana Jones Principle
Deception should change the future. If there is no behavioural change in the target resulting from their erroneous sensemaking, the same outcome could and would have been achieved by the deceiver doing nothing.

The necessity to focus on changing the target's behaviour to the deceiver's advantage is also reflected in the 'Camilla Principle', named after a hard-won lesson learned by Dudley Clarke in 1940, from his planning and subsequent execution of Operation Camilla:

"In the first deception plan I ever tackled I learned a lesson of inestimable value. The scene was Abyssinia... General Wavell wanted the Italians to think he was about to attack them from the south in order to draw-off forces from those opposing him on the northern flank. The deception went well enough - but the results were just the opposite of what Wavell wanted. The Italians drew back in the South, and sent what they could spare from there to reinforce the North, which was of course the true British objective. After that it became a creed in 'A' Force to ask a General 'What do you want the enemy to do?' And never 'What do you want him to think?' It was surprising how difficult they often found it to produce an answer."
Clarke, D. (1972). Some Personal Reflections on the Practice of Deception in the Mediterranean Theatre from 1941 to 1945. In: Master of Deception, David Mure (Editor). London: William Kimber. p. 273-275.

The Camilla Principle
Always focus on what you want the target to do, not just want you want the target to think.

In many domains the deceiver's behaviour change goal for the target may be quite straightforward. For example, in military deception, the goal may be to get the enemy to move their forces to one location while you attack in another. In a cyber phishing attack, the goal could be to get the target to click on a link that will result in malware (software that compromises the integrity of a computer system) being installed on their device. And in sport, the goal might be to fool the opposing team into deploying their defenders to defend against the empty-handed person that is pretending to carry the ball, while the real ball carrier crosses the goal line unopposed.

In other domains, the deceiver's behaviour change goal for the target may be more subtle. On first consideration it may not be obvious as to a magician's

desired behaviour change in an audience member that is watching them perform a magic effect? Similarly, what behaviour change is desired when a person heading out for a date uses concealer makeup to cover up their acne? One might also ask what behavioural change is desired by a painter that seeks to fool his audience through his use of trompe l'oeil (an illusory artistic technique designed to fool the observer into perceiving painted features as existing in three dimensions - such as the 1446 work 'Portrait of a Carthusian' by early Netherlandish painter Petrus Christus, that includes a lifelike representation of a fly, replete with shadow, that appears to be sitting on the inner edge of the painting's frame)? In each of these cases it is worth thinking about what the target's immediate and longer-term behaviour would have been had the deception failed. The spectator at the magic show may not have applauded, would probably not have told others about the amazing show he was at (indeed, he probably would have told others how bad the show was if it didn't fool him), and he would probably not go to see the magician again next time they were in town. The other person on the date (especially if they are overly concerned with their prospective partner's appearance) may have been less attracted to their date, could inadvertently have stared at their acne and made them self-conscious and lose confidence, they may have flirted less with them, and (when combined with their date's loss of confidence) developed less rapport, and as a result they may have decided not to see each other again. And for the spectator who viewed Christus's painting, had they failed to spot (and then realised the falsehood of) the fly sitting on the frame, they may not have experienced that inner moment of delight, they may not have excitedly told others about this moment of personal discovery, and they may not have been inclined to keep an eye-out for other works or exhibitions by the same artist. They may also have decided not to purchase this particular work of art. In all of these cases, successful deception has changed the future behaviour of the target.

In some circumstances the deceiver may wish the target to engage in behaviours that are not based on erroneous sensemaking, but that nevertheless lead to erroneous sensemaking and subsequent behaviour change that benefits the deceiver. For example, while at the roulette table a deceiver may wish to exploit her partner's pre-planned and exceptionally well-timed sneeze to misdirect the croupier's and other player's attention, and in that moment place their chips on the winning number after the ball has landed (an illegal move known as 'past-posting'). The sneeze changes the behaviour of the croupier by momentarily attracting their attention towards the sneezer; the croupier's behaviour has therefore changed, but this change is not the result of erroneous sensemaking. At this stage, the croupier has also not yet been fooled. It is only as a result of the croupier not noticing the deceiver's illegal placement of the chips that occurs a fraction of a second after the sneeze, and therefore believing that the chips

have been placed legitimately, that they erroneously pay-out the winnings to the deceiver. The croupier's erroneous sensemaking therefore results in a change to their behaviour, and this behaviour benefits the deceiver. Such issues regarding causality are address in the section 'Measures of Effect' on page 91.

Secrets, revelations and surprises

"One should not suspect, let alone detect [the use of deception]."
S.W. Erdnase, The Expert at the Card Table (Erdnase, 1902)

This principle applies to a wide variety of deception in which even the target's suspicion regards the mere possibility of deception could prove disastrous to the deceiver, such as in under-cover police operations, intelligence work, cheating in a casino, etc. However, in other domains, this idea does not necessarily apply. In the example cited earlier of Christus's fly, the deceiver obtained benefit as a result of the discovery of the deception by the spectator. If the spectator had seen the fly but not realised that it was false, the deceiver would most likely not have gained the advantage resulting from the deception being discovered.

In some cases, the use of deception will always necessarily involve a reveal. When a magician performs a magic effect, there is always some kind of reveal of an impossible outcome, that lets the spectator know that they have been deceived. In many types of military deception (for example, fooling the enemy as to the timing or location of an attack) once the real activity occurs, the deception is revealed and the target becomes aware that they have been fooled. In both of these instances, the revelation of the deception creates surprise. When the target is not aware that deception is present or has occurred, they are not surprised.

In some circumstances, the deceiver can only gain advantage if they remain covert and the deception is never discovered; in other circumstances, the deceiver can only gain benefit if the target realises they have been fooled. And in some forms of deception, there is no option but to reveal the deception to the target via the process of gaining advantage.

Once deception has been discovered, can it be repeated?

Revelation of the use of deception to the target may result in the following problems for the deceiver: a loss of initiative, revelation of a covert capability, creating an expectation of future use of deception in the target, inducing paranoia and suspicion. However, just because the target knows that you have used deception to fool them previously, does not mean that you cannot use deception against the same target again.

Good deception will include a range of methods for divorcing method from effect. This means that the target will know that they have been fooled, but will not know how they were fooled. Moreover, the deceiver can also plant false clues that will lead the target to conclude that a different method has been used to achieve the effect. Even if the target knows exactly how they were fooled, this creates a set of expectations that can be exploited, for example by changing-up the method through which the same effect is achieved next time. In addition, real activity can be portrayed as deceptive activity, exploiting and apparently confirming the target's suspicions (an activity known as 'reverse deception').

The Reuse Principle
Revelation of the use of deception to the target does not preclude its future use. However, good deception will always build-in the capability to deceive the same target again in the future.

The principles of deception

In studying deception across a wide variety of different domains, such as those cited at the start of this section, it becomes apparent that there are several common, recurrent and emergent properties of deception that transcend domain and application:

- All humans, irrespective of age, gender or culture, rely on the same core psychological processes to make sense of the world and generate action. These processes include: attention, perception, sensemaking, expectation, emotion and behaviour. All are prone to error, and to deliberate manipulation.
- Common strategies for manipulating these processes can be observed occurring across different domains of practice.
- Both the psychological processes identified, and the strategies employed to manipulate them, are scalable, and their application can be observed at all levels from individual, to group, to organisation (and, potentially at higher levels still).

From this foundation, seven generic, transportable (across domains), and scalable principles have been identified that provide a foundation both for understanding how deception works, and for designing effective deceptive action:

1. Deception is achieved through the presentation, placement and concealment of temporally anchored perceptual cue sequences that, via pattern recognition, influence the process of sensemaking.
2. Cues enabling deception can occur across sensory forms and may be physical or derived from communications channels.

3. A range of cognitive, emotive, social, and environmental events and properties can be manipulated to shape, constrain, truncate or disrupt a target's pattern matching process to enable deception.
4. Expectations are central to belief. Careful building, reinforcement, satisfaction and violation of the target's expectancies can be used to influence erroneous belief formulation and development.
5. Deception is more successful if it includes some form of emotional stress or arousal, which can induce time pressure and interfere with reasoning.
6. Principles 1-5 apply not just to individuals, but also to groups.
7. Deception is ethically value-neutral, and the same processes that enable deception can be used for malevolent or benevolent purposes. It is therefore the intent behind the deception, the purpose to which deception is put, the process that is enacted, and the outcome arising from the use of deception that must be subject to careful ethical scrutiny and evaluation.

These principles provide the foundation for a systematic approach to designing deceptive action designed to fool others.

The four curses of the influence and deception planner

All influence and deception practitioners are subject to a range of 'deception curses' that have been identified over the past 10 years of conducting deception research and working with deception practitioners. Such curses are virtually inescapable, and are likely to interfere with the conceptualisation and planning of deception action when they inevitably arise. The four curses are:

1. **The Curse of Naivety**. "It'll never work" - the inability of somebody who is not familiar and experienced with the psychological basis of deception to understand how deception works, and what it can achieve.
2. **The Curse of Secret Knowledge**. "They'll never fall for it"- once you know how a deceptive technique works you can no longer experience the 'wonder' of seeing it from a naive position - you thus become dismissive of its power (even if you yourself have been fooled by the technique).
3. **The Curse of Knowledge**. "You get why this works, right?" - an inability to communicate successfully a deceptive idea to someone because you cannot re-experience their position of ignorance and take this context into account within your explanation.
4. **The Curse of Guilty Knowledge**. "I'm holding a perfectly innocent box" - the interference of real time doubt in the successful enactment of the deception; often accompanied by over-compensation and the telegraphing of such doubt to the target.

Whilst one or more of these curses will always be present in any deception planning activity, the curses can be mitigated against using a structure approach to deception planning. This approach is known as 'The Artifice System'.

An overview of the Artifice System

A general sequence for designing deceptive action is:

1. Analyse and operationalise your mission goal, and determine the desired target behaviour change (Behaviour Change).
2. Identify how you will assess whether the deception has worked (Measurement of Effect).
3. Conduct target audience analysis to identify vulnerabilities that can be exploited to bring about behaviour change (Target Audience Analysis).
4. Establish whether deception is a necessary, legal, proportionate, and ethical means for achieving your goals (Deception Check).
5. Plan your deceptive action (Deception Seven Questions, Deception Gambits, Influence Strategies).
6. Map your deceptive plan (Deception Analytics) and establish how you will explain and communicate your deceptive intent to others.
7. Execute the plan (Real Time)

Before working through each of these processes in more detail, it is first necessary to discuss the most fundamental Artifice System component, on which all other components depend – The Six Block Model, addressed in the next chapter.

Summary

Deception is all around us. It exists at all levels of life, from the microbial to the geopolitical, and it confers an evolutionary advantage to both predator and prey. It is defined as: “Deliberate measures to induce erroneous sensemaking and subsequent behaviour within a target audience, to achieve and exploit an advantage.” Deception is a class of influence, and therefore, all deception involves influencing, but not all influence involves deceiving.

Deception seeks to change future outcomes to the benefit of the deceiver. Specifically, deception is directed towards changing a target’s behaviour to the deceiver’s advantage. If the target’s behaviour does not change as a result of their erroneous sensemaking, the same outcome could and would have been achieved by the deceiver doing nothing.

“Human beings, who are almost unique in having the ability to learn from the experience of others, are also remarkable for their apparent disinclination to do so.”

(Adams & Carwardine, 1990)

CPD – Continuing Professional Development for deception practitioners

Introduction

In humans, deception is a deeply ingrained social-psychological strategy, the purpose of which is to gain advantage for attacker and/or defender. The use of deception can be found in fields as diverse as advertising and marketing, magic, practical jokes, verbal and non-verbal communication, politics, social engineering, the psychic industry, sport (both as a tactic, and as cheating), gambling, financial fraud, and many other domains. In all of these domains the competitive advantage belongs to actors who adopt an active stance towards both the threat of deception and the opportunities that it offers. That said, (Whaley, 2006a) argues that:

"Opportunities to gain experience in deception are limited… ...one should not be surprised that so few people throughout history manage to become an expert at the deception game… More can be learned by studying better experienced deceivers."
(Whaley, 2006a, pp. 31-50)

In this spirit of learning from other deceivers, it is recommended that those interested in developing their deceptive thinking skill should become more hyperacuitive, noticing examples of when deception is present in their environment, and seeking to understand and learn from such opportunities.

The frameworks in this handbook provide the scaffolding for building and strengthening your understanding. It provides a structure for breaking deception down into its building blocks, and a set of explanations for how deception is enacted. This understanding can be applied to any environment in which deception occurs.

Developing your influence and deception skills

To strengthen your deception skills, it is recommended that you seek every opportunity to understand, spot and critique the use of:

- The Six Block Model. Use the 6BM as a tool for deconstructing deception into its constituent parts.

- Deception Gambits and Influence Strategies. See if you can find how these strategies have been employed in the cases you are considering.
- Spot and study influence and deception across multiple domains you encounter. Do not limit your study to just your domain of practice. Make a point of studying deception in other domains, including the wide range of domains referenced in this handbook
- Study expert influencers and deceivers in other domains. Make a point of learning about the individuals who have become experts at deception. How did they become so skilful? Where did they learn from? What did they read? And who did they study?
- Link theory to your practice of deception. As you build your theoretical understanding of deception, seek to apply it to your professional practice. Use the theory to guide your practice, and use your practice to expand and develop your theory.

Summary

Opportunities to enhance your deceptive thinking are all around you, if you just keep your eyes open. Next time you visit a supermarket, read an advertisement, watch a politician being interviewed, observe a magic effect, or visit the zoo, take the opportunity to enhance your understanding about deception.

Visit www.artifice.co.uk to explore our range of professional courses that comprehensively support deception and influence practitioners operating in adversarial contexts.

Bibliography

Adams, D., & Carwardine, M. (1990). Last Chance to See. London: William Heinemann Ltd.

Adams, E. S., & Caldwell, R. L. (1990). Deceptive communication in asymmetric fights of the stomatopod crustacean Gonodactylus bredini. Animal Behaviour, 39(4), 706-716. doi: 10.1016/s0003-3472(05)80382-3

Allmann, S., & Baldwin, I. T. (2010). Insects betray themselves in nature to predators by rapid isomerization of green leaf volatiles. Science, 329(5995), 1075-1078. doi: 10.1126/science.1191634

Amagase, S. (1972). Digestive enzymes in insectivorous plants III. Acid proteases in the genus Nepenthes and Drosera peltata. Journal of Biochemistry, 72(1), 73-81.

Bagnères, A.-G., & Lorenzi, M. C. (2010). Chemical deception/mimicry using cuticular hydrocarbons. Insect Hydrocarbons: Biology, Biochemistry and Chemical Ecology, 282-323.

Baker, A., ten Brinke, L., & Porter, S. (2012). Will get fooled again: Emotionally intelligent people are easily duped by high-stakes deceivers. Legal and Criminological Psychology, no-no. doi: 10.1111/j.2044-8333.2012.02054.x

Balazsi, G., van Oudenaarden, A., & Collins, J. J. (2011). Cellular decision making and biological noise: from microbes to mammals. Cell, 144(6), 910-925. doi: 10.1016/j.cell.2011.01.030

Barnett-Cowan, M. (2010). An illusion you can sink your teeth into: Haptic cues modulate the perceived freshness and crispness of pretzels. Perception, 39(12), 1684-1686.

BBC. (2010). IT analysts stole £33,000 from London casinos. Retrieved 25/09/2013 from http://news.bbc.co.uk/1/hi/england/london/8564741.stm

Bell, J. B., & Whaley, B. (1982). Cheating: Deception in war & magic, games & sports, sex & religion, business & con games, politics & espionage, art & science. New York, N.Y.: St Martin's Press.

Ben-Shakhar, G., & Elaad, E. (2003). The validity of psychophysiological detection of information with the Guilty Knowledge Test: A meta-analytic review. Journal of Applied Psychology, 88(1), 131-151.

Bennett, M., & Waltz, E. (2007). Counterdeception: Principles and Applications for National Security. Norwood, MA: Artech House.

Bernstein, D. A. (2010). Recognizing the perceptual world. Essentials of Psychology (pp. 123–124). Independence, KY: Cengage Learning.

Bessi, A., & Ferrara, E. (2016). Social bots distort the 2016 U.S. Presidential election online discussion. First Monday, 21(7).

Bodmer, S., Kilger, M., Carpenter, G., & Jones, J. (2012). Reverse deception: organized cyber threat counter-exploitation. New York: McGraw-Hill.

Borel, B. (2015). Do Plants Get Stressed? Retrieved 26/11/2016 from http://www.popsci.com/do-plants-get-stressed

Boroditsky, L. (2003). Linguistic relativity. Encyclopedia of cognitive science.

Boster, J., & d'Andrade, R. (1989). Natural and Human Sources of Cross-Cultural Agreement in Ornithological Classification. American Anthropologist, 91(1), 132-142.

Botvinick, M., & Cohen, J. (1998). Rubber hands 'feel' touch that eyes see. Nature, 391(6669), 75.

Boush, D. M., Friestad, M., & Wright, P. (2009). Deception In The Marketplace: The Psychology Of Deceptive Persuasion and Consumer Self-protection. New York: Routledge.

Broderbauer, D., Diaz, A., & Weber, A. (2012). Reconstructing the origin and elaboration of insect-trapping inflorescences in the Araceae. Am J Bot, 99(10), 1666-1679. doi: 10.3732/ajb.1200274

Brown, D. (2001). Absolute Magic. Bristol: Derren Brown.

Byrne, R. W., & Corp, N. (2004). Neocortex size predicts deception rate in primates. Proceedings of Biological Science, 271(1549), 1693-1699. doi: 10.1098/rspb.2004.2780

Carson, T. L. (2009). Lying, Deception, and Related Concepts. In C. Martin (Ed.), The Philosophy of Deception (pp. 153-187). Oxford: Oxford University Press.

Cecalio, P., Perez-Cabezas, B., Santarem, N., Maciel, J., Rodrigues, V., & Cordeiro da Silva, A. (2014). Deception and Manipulation: The Arms of Leishmania, a Successful Parasite. Frontiers in Immunology, 5. doi: 10.3389/fimmu.2014.00480

Chabris, C. F., & Simons, D. J. (2010). The Invisible Gorilla: and Other Ways Our Intuitions Deceive Us. New York: Crown.

Chakrabortee, S., Kayatekin, C., Newby, G. A., Mendillo, M. L., Lancaster, A., & Lindquist, S. (2016). Luminidependens (LD) is an Arabidopsis protein with prion behaviour. Proc Natl Acad Sci U S A, 113(21), 6065-6070. doi: 10.1073/pnas.1604478113

Chief of Joint Operations - Permanent Joint Headquarters. (1998). Joint Doctrine Pamphlet 2/98: Deception.

Clarke, D. (1972). Some Personal Reflections on the Practice of Deception in the Mediterranean Theatre from 1941 to 1945. In D. Mure (Ed.), Master of Deception (pp. 273-275). London: William Kimber.

Cole, C., Jones, L., McVeigh, J., Kicman, A., Syed, Q., & Bellis, M. A. (2010). Cut: A guide to the adulterants, bulking agents and other contaminants found in illicit drugs. Liverpool: Centre for Public Health, Faculty of Health and Applied Social Sciences, John Moores University.

Conan-Doyle, A. (1891). A Scandal in Bohemia. The Strand Magazine(July).

Coyle, G. A., & Wilson, A. (2013). Haversack Ruses—From Leather to Digital. International Journal of Intelligence and CounterIntelligence, 27(1), 156-177. doi: 10.1080/08850607.2013.807197

Craig, A. D., & Bushnell, M. C. (1994). The thermal grill illusion: unmasking the burn of cold pain. Science, 265, 252-255.

Daniel, D. C., Herbing, K. L., Reese, W., Heur, R. J., Serbin, T. R., Moose, P. H., & Sherwin, R. G. (1980). Multidisciplinary Perspectives on Military Deception. (NPS-56-80-112). Monterey, California: Naval Postgraduate School.

DCDC. (2007). JDP 3-80.1: OPSEC, Deception and PSYOPS. (Joint Doctrine Publication 3-80.1). Shrivenham: Development, Concepts and Doctrine Centre.

Dener, E., Kacelnik, A., & Shemesh, H. (2016). Pea Plants Show Risk Sensitivity. Curr Biol, 26(13), 1763-1767. doi: 10.1016/j.cub.2016.05.008

Ding, X. P., Wellman, H. M., Wang, Y., Fu, G., & Lee, K. (2015). Theory-of-Mind Training Causes Honest Young Children to Lie. Psychol Sci, 26(11), 1812-1821. doi: 10.1177/0956797615604628

Dobinson, C. (2013). Fields of Deception: Britain's Bombing Decoys of the Second World War. York: Methuen.

Drake, N. (2012). Spider That Builds Its Own Spider Decoys Discovered. wired.com. Retrieved 21/11/2016 from https://www.wired.com/2012/12/spider-building-spider/

Ekman, P. (1985). Telling lies : clues to deceit in the marketplace, politics, and marriage. New York ; London: Norton.

Erdnase, S. W. (1902). The Expert at the Card Table. Artifice, ruse, and subterfuge at the card table: a treatise on the science and art of manipulating cards. Chicago: McKinney & Co.

Evans, A. D., & Lee, K. (2011). Verbal deception from late childhood to middle adolescence and its relation to executive functioning skills. Dev Psychol, 47(4), 1108.

Evans, A. D., & Lee, K. (2013). Emergence of Lying in Very Young Children. Dev Psychol. doi: 10.1037/a0031409

Fitzkee, D. (1945). Magic By Misdirection. San Rafael, CA: San Rafael House.

Flower, T. P., Gribble, M., & Ridley, A. R. (2014). Deception by Flexible Alarm Mimicry in an African Bird. Science, 344(6183), 513-516. doi: 10.1126/science.1249723

Foote, A., & Spalding, W., R. (1905). Modern Harmony in its Theory and Practice. Boston: The Arthur P. Schmidt Co.

Ford, B. J. (2004). Are Cells Ingenious? Microscope, 52(3/4), 135-144.

Geitge, A. (2017). How to break a CAPTCHA system in 15 minutes with Machine Learning. Retrieved 17/03/2018 from https://medium.com/@ageitgey/how-to-break-a-captcha-system-in-15-minutes-with-machine-learning-dbebb035a710

Gerwehr, S. (2006). Cross-Cultural Variation in Denial and Deception. Defense Intelligence Journal, 15(2).

Gilbert, L. E. (1971). Butterfly-plant coevolution: Has Passiflora adenopoda won the selectional race with heliconiine butterflies? Science, 172(3983), 585-586.

Gilbert, L. E. (1982). The coevolution of a butterfly and a vine. Scientific American, 247(2), 102-107.

Goodman, K. (2008). Improvisation for the spirit: Live a more creative, spontaneous, and courageous life using the tools of improv comedy: Sourcebooks, Inc.

Göpel, Y., & Görke, B. (2014). Lies and deception in bacterial gene regulation: the roles of nucleic acid decoys. Molecular microbiology, 92(4), 641-647.

Granhag, P. A., & Strömwall, L. A. (Eds.). (2004). The Detection of Deception in Forensic Contexts. Cambridge: Cambridge University Press.

Granhag, P. r. A., Vrij, A., & Verschuere, B. (2015). Detecting deception : current challenges and cognitive approaches. Hoboken: Wiley.

Gregory, R. L., & Zangwill, O. L. (1987). The Oxford companion to the mind: Oxford University Press.

Guilford, J. P. (1967). The nature of human intelligence.

Guillem, R. M., Drijfhout, F., & Martin, S. J. (2014). Chemical deception among ant social parasites. Current Zoology, 60(1), 62-75.

Haithem, Z., Ayisi, K. D., & El-Hedhli, K. (2014). Consumer Fraudulent Behavior: a Cross-Cultural Perspective. ASBBS Proceedings, 21(1), 315.

Hebborn, E. (2004). The Art Forger's Handbook. Woodstock, N.Y.: Overlook Press.

Heckman, K. E., Stech, F. J., Thomas, R. K., Schmoker, B., & Tsow, A. W. (2016). Cyber Denial, Deception and Counter Deception: A Framework for Supporting Active Cyber Defense. New York: Springer.

Henderson, S. M. (2011). Deceptive Thinking. Paper presented at the 1st MilDec Military Deception Symposium, 2nd-3rd November 2011, Defence Academy of the United Kingdom, Shrivenham.

Henderson, S. M., & Lewis, P. (2012). Understanding and Exploiting Cyber Deception and Disruptive Behaviour. Farnborough: QinetiQ.

Henderson, S. M., Pascual, R. G., Outteridge, C., Cowx, R. W., Helman, S., & Lambillion, S. M. (2007). A Review of Deception in non-military domains: Psychological principles. (QINETIQ/D&TS/C&IS/CR0702827 /1.1). Farnborough: QinetiQ.

Herman, A. (2016). Visual intelligence: sharpen your perception, change your life. Boston: Houghton Mifflin Harcourt.

Herz, R. S., & von Clef, J. (2001). The influence of verbal labelling on the perception of odors: Evidence for olfactory illusions? Perception, 30(3), 381-391.

Higham, J. (2009). Secrets of Improvisational Magic. London: Justin Higham.

Higham, J. (2011). The KOSBE System: The Mechanics of Improvisation in Card Magic. London: Justin Higham.

Hiller, I. (1989). Killdeer: Introducing Birds to Young Naturalists The Louise Lindsey Merrick Texas Environment Series (Vol. 9, pp. 35-37). College Station, Texas: Texas A&M University Press.

Hoffman, R., & Fiore, S. M. (2007). Perceptual (Re)learning: A Leverage Point for Human-Centered Computing. IEEE Intelligent Systems, 22(3), 79-83.

Holt, T. (2008). The Deceivers: Allied Military Deception In The Second World War (Vols 1+2). London: The Folio Society Ltd.

Hotz, R. L. (2011). The Truthy Project Ferrets Out Online Deception: In an era of digital deception, scientists at Indiana University are using Twitter to investigate the nature of truth, lies and politics. Retrieved 09/01/2012 from http://online.wsj.com/video/the-truthy-project-ferrets-out-online-deception/219A2EA6-4D22-4F5B-8D96-81AF342104F7.html

HQ Dept of Army. (1988). FM 90-2 Battlefield Deception. Washingston: DOD Department of the Army.

Hutton, R., Klein, G., & Wiggins, S. (2008). Designing for sensemaking: A macrocognitive approach. Paper presented at the Computer Human Interactions 2008, Florence, Italy:.

Hyman, R. (1977). Cold Reading: How to Convince Strangers That You Know All About Them. The Zetetic, 1(2), 18-37.

Isen, A. M., Nygren, T. E., & Ashby, F. G. (1988). Influence of positive affect on the subjective utility of gains and losses: it is just not worth the risk. J Pers Soc Psychol, 55(5), 710-717.

James, W. (1890). The principles of psychology. New York: H. Holt and company.

Janis, I. L., & Mann, L. (1977). Decision making: a psychological analysis of conflict, choice, and commitment. London: Free Press; Collier Macmillan.

Jansen, F., & Ganesh, M. I. (2015). Is it possible to fool an algorithm? Making a case for data obfuscation. Paper presented at the Auditing Algorithms Workshop, International Conference on the Web and Social Media (ICWSM-15), May 26th-29th, 2015, Oxford UK.

Jastrow, J. J. (1888). The Psychology of Deception. Popular Science Monthly, 34, 145-157.

Jersakova, J., Johnson, S. D., & Kindlmann, P. (2006). Mechanisms and evolution of deceptive pollination in orchids. Biol Rev Camb Philos Soc, 81(2), 219-235. doi: 10.1017/S1464793105006986

Johnson, R. U., & Buel, C. C. (1889). Battles and Leaders of the Civil War (1884 - 1888) (Vol. II). New York: The Century Co.

Johnsson, R. (1971). Too-Perfect Theory. Hierophant 5-6, 5/6, 247-250.

Johnsson, R., Racherbaumer, J., Stone, T., Christian, M., Neale, R., Fitch, B., . . . Aronson, S. (2008). The Too Perfect Theory: Lybrary.com.

Jones, R. V. (1942). Report No.13. D.T.: Beams/Radar (D.T. Paper). 10th January 1942. London: National Archives (National Cataloguing Unit for the Archives of Contemporary Scientists).

Juels, A., & Ristenpart, T. (2014). Honey encryption: Security beyond the brute-force bound. Paper presented at the Annual International Conference on the Theory and Applications of Cryptographic Techniques.

Jürgens, A., Dötterl, S., Liede-Schumann, S., & Meve, U. (2010). Floral scent composition in early diverging taxa of Asclepiadoideae, and Secamonoideae (Apocynaceae). South African Journal of Botany, 76(4), 749-761. doi: 10.1016/j.sajb.2010.08.013

Jurgens, A., Dotterl, S., & Meve, U. (2006). The chemical nature of fetid floral odours in stapeliads (Apocynaceae-Asclepiadoideae-Ceropegieae). New Phytol, 172(3), 452-468. doi: 10.1111/j.1469-8137.2006.01845.x

Jürgens, A., & Shuttleworth, A. (2015). Carrion and Dung Mimicry in Plants. 361-386. doi: 10.1201/b18819-20

Karras, T., Aila, T., Laine, S., & Lehtinen, J. (2017). Progressive growing of gans for improved quality, stability, and variation. arXiv preprint arXiv:1710.10196.

Kirk, P. L. (1953). Crime investigation: physical evidence and the police laboratory. . New York: Interscience Publishers.

Kitaoka, A. (2004). Dongurakokko (The donguri wave). Retrieved 28/07/2013 from http://www.psy.ritsumei.ac.jp/~akitaoka/saishin2e.html

Klein, G. (1993). Characteristics of commander's intent statements. Paper presented at the The 1993 Symposium on Command and Control Research, McLean, VA.

Klein, G., Moon, B., & Hoffman, R. R. (2006a). Making Sense of Sensemaking 1: Alternative Perspectives. IEEE Intelligent Systems, 21(4), 70-73.

Klein, G., Moon, B., & Hoffman, R. R. (2006b). Making Sense of Sensemaking 2: A Macrocognitive Model. IEEE Intelligent Systems, 21(5), 88-92.

Klein, G., Philips, J. K., Rall, E. L., & Peluso, D. A. (2007). A Data-Frame Theory of Sensemaking. In R. Hoffman (Ed.), Expertise Out of Context: Proceedings of the Sixth Conference on Naturalistic Decision Making (pp. 113-155). New York, NY: Lawrence Erlbaum Associates.

Klein, G. A., Calderwood, R., & Clinton-Cirocco, A. (1986). Rapid Decision Making on the Fire Ground. Paper presented at the Human Factors and Ergonomics Society 30th Annual Meeting, Dayton, Ohio.

Knodler, L. A., Celli, J., & Finlay, B. B. (2001). Pathogenic Trickery- Deception Of Host Cell Processes. Nature, 2(8), 578-588. doi: 10.1038/35085062

Kondev, J. (2014). Bacterial decision making. Physics Today, 67(2), 31-36. doi: 10.1063/pt.3.2276

Kotler, P., & Armstrong, G. (2006). Principles of Marketing. London: Pearson Prentice Hall.

Kubovy, M., & Tyler, C. Psychology of Perspective and Renaissance Art: Illusion, Delusion, Collusion, and Perceptual Paradox. Retrieved 13/03/2018 from http://www.webexhibits.org/arrowintheeye/illusion3.html

Kuhn, G., & Findlay, J. M. (2010). Misdirection, attention and awareness: inattentional blindness reveals temporal relationship between eye movements and visual awareness. Q J Exp Psychol (Hove), 63(1), 136-146. doi: 10.1080/17470210902846757

Kuhrer, M., Hupperich, T., Rossow, C., & Holz, T. (2014). Hell of a Handshake: Abusing TCP for Reflective Amplification DDoS Attacks. Paper presented at the 8th USENIX Workshop on Offensive Technologies, San Diego, CA.

Lamere, P. (2009). Inside the precision hack. Retrieved 22/11/2016 from https://musicmachinery.com/2009/04/15/inside-the-precision-hack/

Lamont, P., & Wiseman, R. (2005). Magic in Theory. Hertfordshire: University of Hertfordshire Press.

Langer, E., Djikic, M., Pirson, M., Madenci, A., & Donohue, R. (2010). Believing is seeing: using mindlessness (mindfully) to improve visual acuity. Psychol Sci, 21(5), 661-666. doi: 10.1177/0956797610366543

Leal, S., Vrij, A., Nahari, G., & Mann, S. (2016). Please be Honest and Provide Evidence: Deterrents of Deception in an Online Insurance Fraud Context. Applied Cognitive Psychology, 30(5), 768-774. doi: 10.1002/acp.3252

Lee, C. W. (2010). The Roots of Astroturfing. Contexts, 9(1), 73-75. doi: 10.1525/ctx.2010.9.1.73.

Lee, K., & Ross, H. J. (1997). The concept of lying in adolescents and young adults: Testing Sweetser's folkloristic model. Merrill-Palmer Quarterly (1982-), 255-270.

Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. J Pers Soc Psychol, 81(1), 146-159.

Lerner, J. S., & Tiedens, L. Z. (2006). Portrait of the angry decision maker: How appraisal tendencies shape anger's influence on cognition. Journal of Behavioral Decision Making (Special Issue on Emotion and Decision Making), 19, 115-137.

Lev-Yadun, S. (2014). Müllerian mimicry in aposematic spiny plants. Plant Signaling & Behavior, 4(6), 482-483. doi: 10.4161/psb.4.6.8848

Lev-Yadun, S. (2016). Additional Cases of Defensive Visual Batesian Mimicry Among Plants Defensive (anti-herbivory) Coloration in Land Plants (pp. 173-174). Cham: Springer International Publishing.

Lev-Yadun, S. (2014). Defensive masquerade by plants. Biological Journal of the Linnean Society, 113(4), 1162-1166.

Limb, C. J., & Braun, A. R. (2008). Neural substrates of spontaneous musical performance: an FMRI study of jazz improvisation. PLoS ONE, 3(2), e1679. doi: 10.1371/journal.pone.0001679

Livingston, B. (2005). 'Googlewashing' Makes Your Site Invisible. Retrieved 22/11/2016 from http://www.datamation.com/columns/executive_tech/print.php/3560691

Long, J. (2008). No Tech Hacking – A Guide to Social Engineering, Dumpster Diving, and Shoulder Surfing. Rockland, MA: Syngress Publishing.

Lotto, B. (2017). Deviate: the science of seeing differently (1st edition. ed.). New York, NY: Hachette Books.

Lovell, S. (1996). How to Cheat at Everything: A Con Man Reveals the Secrets of the Esoteric Trade of Cheating, Scams, and Hustles. Philadelphia PA: Running Press Book Publishers.

Macknik, S., Martinez-Conde, S., & Blakeslee, S. (2011). Sleights of Mind: What the neuroscience of magic reveals about our everyday deceptions. London: Profile Books.

Macknik, S. L., & Martinez-Conde, S. (2004). Temporal Factors. In S. Liversedge, I. Gilchrist, & S. Everling (Eds.), Oxford Handbook of Eye Movements (pp. 1060-1062). Oxford: Oxford University Press.

Mallet, J. (1995). Why are there so many mimicry rings? Correlations between habitat, behaviour and mimicry in Heliconius butterflies. Biological Journal of the Linnean Society(55), 159-180.

Mallet, J., McMillan, W. O., & Jiggins, C. D. (1998). Mimicry and Warning Color at the Boundary between Races and Species. In D. J. Howard & S. H. Berlocher (Eds.), Endless Forms, Species and Specialisations (pp. 390-403). Oxford: Oxford University Press.

Malt, B. C. (1995). Category coherence in cross-cultural perspective. Cognitive psychology, 29(2), 85-148.

Mant, J., Peakall, R., & Schiestl, F. P. (2005). Does selection on floral odor promote differentiation among populations and species of the sexually deceptive orchid genus Ophrys? Evolution, 59(7), 1449-1463.

Marcus, R. (2005). The great casino heist. London: Robinson.

Maskelyne, N., & Devant, D. (1911). Our magic: the art in magic, the theory of magic, the practice of magic. New York: E.P. Dutton & Co.

Matusikova, I., Salaj, J., Moravcikova, J., Mlynarova, L., Nap, J. P., & Libantova, J. (2005). Tentacles of in vitro-grown round-leaf sundew (Drosera rotundifolia L.) show induction of chitinase activity upon mimicking the presence of prey. Planta, 222(6), 1020-1027. doi: 10.1007/s00425-005-0047-5

Maxim, D., Mathtech Inc., & Everest Consulting Associates Inc. (1982). Deception failures, non-failures and why. Washington: Office of Research and Development (Deception Research Program), Central Intelligence Agency.

Maxim, D. L. (1980). Deception Maxims: Fact And Folklore. Washington DC: Everest Consulting Associates Inc., Mathtech Inc.

McGovern, R. (2017). Another Hatchet Job on Snowden. Retrieved 18/03/2018 from https://consortiumnews.com/2017/03/03/another-hatchet-job-on-snowden/

Meyer, K. M., Soldaat, L. L., Auge, H., & Thulke, H. H. (2014). Adaptive and selective seed abortion reveals complex conditional decision making in plants. Am Nat, 183(3), 376-383. doi: 10.1086/675063

Millen, A. E., Hope, L., Hillstrom, A. P., & Vrij, A. (2016). Tracking the truth: the effect of face familiarity on eye fixations during deception. Q J Exp Psychol (Hove), 1-14. doi: 10.1080/17470218.2016.1172093

Mills, C. A., & Mills, A. L. (2008). Alexandria, 1861-1865. Mt. Pleasant, SC: Arcadia Publishing.

Mitnick, K., & Simon, W. L. (2002). The Art of Deception: Controlling the Human Element of Security. Indianapolis, Indiana: Wiley Publishing Inc.

Moltke, H., Graf von. (1892). Militarische Werke (vol. 2, part 2). Berlin: Ernst Sigfried Mittler & Son.

Moore, P. A. (2015). The Hidden Power of Smell: How Chemicals Influence Our Lives and Behavior. New York: Springer International Publishing.

Morris, S. P. (2013). Deception in Sports. Journal of the Philosophy of Sport, 41(2), 177-191. doi: 10.1080/00948705.2013.785419

Nahai, N. (2012). Webs of influence: the psychology of online persuasion. Harlow: Pearson Business.

National Research Council Committee to Review the Scientific Evidence on the Polygraph. (2003). The Polygraph and Lie Detection. Washington, D.C.: National Academies Press.

Newhagen, J. E., & Rafaeli, S. (1996). Why communication researchers should study the Internet: A dialogue. Journal of computer-mediated communication, 1(4), JCMC145.

Nguyen, A., Yosinski, J., & Clune, J. (2015). Deep neural networks are easily fooled: High confidence predictions for unrecognizable images. Paper presented at the Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition.

Nisbett, R. (2004). The geography of thought: How Asians and Westerners think differently... and why. New York: Simon and Schuster.

Orlowski, A. (2003). Anti-war slogan coined, repurposed and Googlewashed … in 42 days. Retrieved 22/11/2016 from http://www.theregister.co.uk/2003/04/03/antiwar_slogan_coined_repurposed/

Ortiz, D. (1984). Gambling scams : how they work, how to detect them, how to protect yourself. New York: Dodd, Mead.

Oxford English Dictionary. (2016). Definition of 'deception'. Oxford: Oxford University Press.

Palomäki, J., Yan, J., & Laakasuo, M. (2016). Machiavelli as a poker mate — A naturalistic behavioural study on strategic deception. Personality and Individual Differences, 98, 266-271. doi: 10.1016/j.paid.2016.03.089

Paulus, H. F. (2006). Deceived males–pollination biology of the Mediterranean orchid genus Ophrys (Orchidaceae). Journal Europäischer Orchideen, 38(2), 303-353.

Pfleegor, A. G., & Roesenberg, D. (2013). Deception in Sport: A New Taxonomy of Intra-Lusory Guiles. Journal of the Philosophy of Sport, 41(2), 209-231. doi: 10.1080/00948705.2013.785424

Pinker, S. (2003). Language as an adaptation to the cognitive niche. In M. Christiansen & S. Kirb (Eds.), Language Evolution: States of the Art. New York: Oxford University Press.

Plassmann, H., O'Doherty, J., Shiv, B., & Rangel, A. (2008). Marketing actions can modulate neural representations of experienced pleasantness. Proceedings of the National Academy of Sciences, 105(3), 1050-1054. doi: 10.1073/pnas.0706929105

Raghunathan, R., & Pham, M. T. (1999). All Negative Moods Are Not Equal: Motivational Influences of Anxiety and Sadness on Decision Making. Organ Behav Hum Decis Process, 79(1), 56-77. doi: 10.1006/obhd.1999.2838

Reeves-Evison, T. (2016). Deception and Fiction as Forms of World-making in Contemporary Art. Paragrana, 25(2), 135–143. doi: 10.1515/para-2016-0034

Reid, C. R., Garnier, S., Beekman, M., & Latty, T. (2015). Information integration and multiattribute decision making in non-neuronal organisms. Animal Behaviour, 100, 44-50. doi: 10.1016/j.anbehav.2014.11.010

Reid, C. R., MacDonald, H., Mann, R. P., Marshall, J. A., Latty, T., & Garnier, S. (2016). Decision-making without a brain: how an amoeboid organism solves the two-armed bandit. J R Soc Interface, 13(119). doi: 10.1098/rsif.2016.0030

Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. Policy sciences, 4(2), 155-169.

Robert-Houdin, J.-E. (1860). Memoirs of Robert-Houdin: Ambassador, Author, and Conjurer. London: Chapman and Hall.

Robert-Houdin, J. E. (1878). Comment on devient sorcier: les secrets de la prestidigitation et de la magie. Paris: Calmann Lévy.

Roe, K. (2017). Leadership: Practice and Perspectives. Oxford: Oxford University Press.

Rowe, N. C., & Rrushi, J. (2016). Introduction to Cyberdeception. Switzerland: Springer International Publishing.

Rowland, I. (2008). The Full Facts Book of Cold Reading: A Comprehensive Guide to the Most Persuasive Psychological Manipulation Technique in the World and Its Application to Psychic Readings: Ian Rowland, Limited.

RTO Task Group SCI-131/RTG-028. (2008). Military Impact of Future Denial and Deception. (RTO Technical Report TR-SCI-131). NATO.

Sanders, J. G., Ueda, Y., Minemoto, K., Noyes, E., Yoshikawa, S., & Jenkins, R. (2017). Hyper-realistic face masks: a new challenge in person identification. Cogn Res Princ Implic, 2(1), 43. doi: 10.1186/s41235-017-0079-y

Schaefer, H. M., & Ruxton, G. D. (2009). Deception in plants: mimicry or perceptual exploitation? Trends Ecol Evol, 24(12), 676-685. doi: 10.1016/j.tree.2009.06.006

Schaffner, J. H. (1910). Leaf Markings of Certain Ohio Plants. The Ohio Naturalist, 11(2), 234-245.

Scherer, K. R. (2003). Introduction: Cognitive components of emotion. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), Handbook of affective sciences (pp. 563–571). New York: Oxford University Press.

Schiestl, F. P., Peakall, R., Mant, J. G., Ibarra, F., Schulz, C., Franke, S., & Francke, W. (2003). The chemistry of sexual deception in an orchid-wasp pollination system. Science, 302(5644), 437-438. doi: 10.1126/science.1087835

Schiestl, F. P., & Schluter, P. M. (2009). Floral isolation, specialized pollination, and pollinator behavior in orchids. Annu Rev Entomol, 54, 425-446. doi: 10.1146/annurev.ento.54.110807.090603

Scopece, G., Musacchio, A., Widmer, A., & Cozzolino, S. (2007). Patterns of reproductive isolation in Mediterranean deceptive orchids. Evolution, 61(11), 2623-2642. doi: 10.1111/j.1558-5646.2007.00231.x

Sekaran, U. (2003). Research Methods for Business. New York, New York: John Wiley & Sons.

Sharif, M., Bhagavatula, S., Bauer, L., & Reiter, M. K. (2016). Accessorize to a crime: Real and stealthy attacks on state-of-the-art face recognition. Paper presented at the Proceedings of the 2016 ACM SIGSAC Conference on Computer and Communications Security.

Shepard, R. N. (1964). Circularity in judgments of relative pitch. Journal of the Acoustical Society of America, 36(12), 2346–2353.

Shipley, J. T. (1953). Dictionary of World Literature: Criticism, Forms, Technique. New York: Philosophical Library.

Shrum, L. J., Liu, M., Nespoli, M., & Lowrey, T. M. (2012). Persuasion in the Marketplace: How Theories of Persuasion Apply to Marketing and Advertising. In J. Dillard & L. Shen (Eds.), The Persuasion Handbook. housand Oaks, CA: Sage.

Sinclair, A. (1996). Young Children's Practical Deceptions And Their Understanding Of False Belief. New Ideas in Psychology, 14(2), 157-173.

Solorio, T., Hasan, R., & Mizan, M. (2013). A Case Study of Sockpuppet Detection in Wikipedia. Paper presented at the Workshop on Language in Social Media (LASM 2013), June 13 2013, Atlanta, Georgia.

Soltau, U., Dötterl, S., & Liede-Schumann, S. (2009). Leaf variegation in Caladium steudneriifolium (Araceae): a case of mimicry? Evolutionary ecology, 23(4), 503-512.

Soviet Deception in The Cuban Misile Crisis.

Spence, S. A., Hunter, M. D., Farrow, T. F., Green, R. D., Leung, D. H., Hughes, C. J., & Ganesan, V. (2004). A cognitive neurobiological account of deception: evidence from functional neuroimaging. Philos Trans R Soc Lond B Biol Sci, 359(1451), 1755-1762. doi: 10.1098/rstb.2004.1555

Staff, U. J. C. o. (2007). US Joint Publication JP 1-02, US Department of Defense Dictionary of Military and Associated Terms. US Department of Defense.

Stajano, F., & Wilson, P. (2009). Understanding Scam Victims: Seven Principles for Systems Security (pp. 22): University of Cambridge Computer Laboratory.

Stech, F., & Elsaesser, C. (2004). Midway revisited: Detecting Deception by Analysis of Competing Hypothesis. Paper presented at the 72nd Military Operational Research Symposium (MORS), Monterey, CA.

Stevens, M. (2007). Predator perception and the interrelation between different forms of protective coloration. Proc Biol Sci, 274(1617), 1457-1464. doi: 10.1098/rspb.2007.0220

Stökl, J., Schlüter, P. M., Stuessy, T. F., Paulus, H. F., Fraberger, R., Erdmann, D., . . . Ayasse, M. (2009). Speciation in sexually deceptive orchids: pollinator-driven selection maintains discrete odour phenotypes in hybridizing species. Biological Journal of the Linnean Society, 98(2), 439-451. doi: 10.1111/j.1095-8312.2009.01279.x

Streinzer, M., Ellis, T., Paulus, H. F., & Spaethe, J. (2010). Visual discrimination between two sexually deceptive Ophrys species by a bee pollinator. Arthropod Plant Interact, 4(3), 141-148. doi: 10.1007/s11829-010-9093-4

Streinzer, M., Paulus, H. F., & Spaethe, J. (2009). Floral colour signal increases short-range detectability of a sexually deceptive orchid to its bee pollinator. J Exp Biol, 212(Pt 9), 1365-1370. doi: 10.1242/jeb.027482

Syrus, P. (85-43BC). Sententiae (E. Wölfflin, Trans.).

Szpunar, K. K., & McDermott, K. B. (2008). Episodic future thought and its relation to remembering: evidence from ratings of subjective experience. Conscious Cogn, 17(1), 330-334. doi: 10.1016/j.concog.2007.04.006

Tangen, J. M., Murphy, S. C., & Thompson, M. B. (2011). Flashed face distortion effect: Grotesque faces from relative spaces. Perception, 40(5), 628-630. doi: 10.1068/p6968

The Telegraph. (2016). Chemicals dealer 'sold more benzocaine to cocaine gang than GlaxoSmithKlein uses in a year'. Retrieved 22/11/2016 from http://www.telegraph.co.uk/news/uknews/law-and-order/12171829/Chemicals-dealer-sold-more-benzocaine-to-cocaine-gang-than-GlaxoSmithKlein-uses-in-a-year.html

Theerasilp, S., & Kurihara, Y. (1988). Complete purification and characterization of the taste-modifying protein, miraculin, from miracle fruit. J Biol Chem, 263(23), 11536-11539.

Thunberg, T. (1896). Förnimmelserne vid till samma ställe lokaliserad, samtidigt pägående köld-och värmeretning. [Förnimmelserne at the same place localized, simultaneous cold and heat stimuli]. Uppsala Läkfören, 1, 489-495.

Tieman, D. M., Zeigler, M., Schmelz, E. A., Taylor, M. G., Bliss, P., Kirst, M., & Klee, H. J. (2006). Identification of loci affecting flavour volatile emissions in tomato fruits. J Exp Bot, 57(4), 887-896. doi: 10.1093/jxb/erj074

Torres, P. (2012). New Species of 'Decoy' Spider Likely Discovered At Tambopata Research Center. Retrieved from http://blog.perunature.com/new-species-of-decoy-spider-likely-discovered-at-tambopata-research-center.html

Trewavas, A. (2002). Mindless mastery. Nature, 415(6874), 841. doi: 10.1038/415841a

Tsvetkova, M., Garcia-Gavilanes, R., Floridi, L., & Yasseri, T. (2017). Even good bots fight: The case of Wikipedia. PLoS ONE, 12(2), e0171774. doi: 10.1371/journal.pone.0171774

Tyler, J. M., Feldman, R. S., & Reichert, A. (2006). The price of deceptive behavior: Disliking and lying to people who lie to us. Journal of Experimental Social Psychology, 42(1), 69-77. doi: 10.1016/j.jesp.2005.02.003

Tzu, S. (500 B.C.). The Art of War.

University of Cambridge. (2015). Conference Programme for: Decepticon International Conference on Deceptive Behavior. University of Cambridge. Retrieved 16/11/2016 from https://www.cl.cam.ac.uk/events/decepticon2015

Vereecken, N. J. (2009). Deceptive Behavior in Plants. I. Pollination by Sexual Deception in Orchids: A Host–Parasite Perspective. 203-222. doi: 10.1007/978-3-540-89230-4_11

Vereecken, N. J., & McNeil, J. N. (2010). Cheaters and liars: chemical mimicry at its finest. Canadian Journal of Zoology, 88(7), 725-752. doi: 10.1139/z10-040

Wada, Y., Masuda, T., & Noguchi, K. (2005). Temporal illusion called 'kappa effect' in event perception. Perception, 34(ECVP Abstract Supplement).

Weick, K. E., & Sutcliffe, K. M. (2007). Managing the unexpected : resilient performance in an age of uncertainty (2nd ed.). San Francisco: Jossey-Bass.

Whaley, B. (2006a). Interdisciplinary Musings on the History of Counterdeception. Defense Intelligence Journal, 15(2), 31-50.

Whaley, B. (2006b). Orson Welles: The Man Who Was Magic: Lybrary.

Whaley, B. (2007). Stratagem: Deception And Surprise In War. Boston: Artech House.

Whaley, B. (2010a). Practise to Deceive: Learning Curves of Military Deception Planners. Washington, DC: Foreign Denial & Deception Committee, National Intelligence Center, Office of the Director of National Security.

Whaley, B. (2010b). When Deception Fails: The Theory Of Outs. Washington, DC: Foreign Denial & Deception Committee, National Intelligence Center, Office of the Director of National Security.

Whaley, B. (2016). Turnabout and deception: crafting the double-cross and the theory of outs. Annapolis, Maryland: Naval Institute Press.

Whaley, B., & Busby, J. (2000). Detecting Deception: Practice, Practitioners and Theory. Trends in Organised Crime, 6(1), 73-105.

Williams, K. S., & Gilbert, L. E. (1981). Insects as selective agents on plant vegetative morphology: egg mimicry reduces egg laying by butterflies. Science, 212(4493), 467-469.

Xenophon. (350 B.C.). On the Cavalry Commander (E. C. Marchant & G. W. Bowersock, Trans.). Cambridge, MA: Harvard University Press.

Xie, Z., Ulrich, L. E., Zhulin, I. B., & Alexandre, G. (2010). PAS domain containing chemoreceptor couples dynamic changes in metabolism with chemotaxis. Proc Natl Acad Sci U S A, 107(5), 2235-2240. doi: 10.1073/pnas.0910055107

Yan, Y., Borrego, E., & Kolomiets, M. V. (2013). Jasmonate Biosynthesis, Perception and Function in Plant Development and Stress Responses. doi: 10.5772/52675

Zibreg, C. (2013). Samsung fined $340,000 over faking negative web comments about competition. Retrieved 22/11/2016 from http://www.idownloadblog.com/2013/10/24/samsung-fined-over-faked-web-comments/

This page is intentionally blank.


artifice
www.artifice.co.uk