NEW APPROACHES IN DECEPTION DETECTION I. BACKGROUND AND THEORETICAL FRAMEWORK

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Tradicionalmente, la investigación en detección de mentiras ha asumido que, al mentir, el ser humano muestra espontáneamente indicios conductuales. Sin embargo, las recientes integraciones meta-analíticas constatan que tales indicios no abundan. Esto ha imprimido un cambio de rumbo en la investigación, que ha tomado dos vías distintas: (a) el desarrollo de estrategias activas de entrevista para detectar mentiras y (b) el empleo de indicios contextuales (en lugar de conductuales) de la mentira. Éste es el primero de dos artículos en los que revisamos esta investigación. Empezamos describiendo las orientaciones tradicionales, así como las evidencias que las cuestionan y que justifican el cambio de orientación, y argumentamos que las nuevas estrategias activas de entrevista deben fundamentarse en modelos teóricos sólidos y coherentes de base cognitiva. En el siguiente artículo, de próxima publicación, se describen específicamente estrategias concretas de entrevista para detectar mentiras, así como la orientación de los indicios contextuales.
Palabras Clave: Detección de mentiras, Claves de la mentira, Carga cognitiva, ADCM, ADCAT.

Deception detection research has traditionally assumed that when humans deceive they spontaneously display tell-tale behavioural indicators. However, recent meta-analytical integrations reveal that such indicators do not abound. This has produced a shift in deception research, which has taken two different directions: (a) the development of active interviewing strategies to detect deception, and (b) the use of contextual (rather than behavioural) indicators of deception. This paper is the first of two articles where we review this research. We begin by describing the traditional approaches, as well as the evidence that questions these approaches and justifies the shift in focus. We also argue that the new active interviewing approaches should be grounded on solid and coherent cognitive models. In the subsequent article (published in this same issue), specific interviewing strategies to detect deception will be described along with the contextual indicia approach.
Key Words: Detection of deception, Deception cues, Cognitive load, ADCM, ADCAT.

THE TRADITIONAL PERSPECTIVE IN RESEARCH INTO DECEPTION DETECTION

In the Western Judeo-Christian tradition, lying is seen as harmful and morally reprehensible. One of the commandments that God wrote in the Tables of the Law delivered to Moses is "Thou shalt not bear false witness against thy neighbour". Religious figures such as St. Augustine and St. Thomas Aquinas were extremely

contrary to deception, considering it a sin (e.g., Pérez, 1996). The negative view of lying is also found in other cultures. Inglehart, Basáñez, Díez-Medrano, Halman and Luijkx (2004) researched the values around the world with people of different countries from all continents and various cultures. They found that 46% of respondents considered that lying out of self-interest is *never* justified.

Thus, lying is wrong; the deceiver is guilty and deserves to pay. Only then will the world be a fair and safe place where all evil will be punished and virtue will prevail. However, for this to happen the deceiver must be identified. Fortunately, nature (or the corresponding God, depending on the culture) has ruled that deceptions are revealed by clear, visible and infallible indicators. There is nowhere to hide; the sin comes to light, shown to the eyes of others. Deceiving is unprofitable because the deceivers will display that stigma, that tell-tale sign of their error that will expose them to public punishment. Therefore, it is futile to try to deceive.

A few years ago, the social psychologist Charles Bond conceived of an ambitious investigation to examine and

compare beliefs about deception indicators worldwide. He recruited an international team of 90 researchers who collected data in 75 different countries. The results revealed strong similarities around the world in beliefs about deception indicators (Global Deception Research Team, 2006). Bond speculated that these global beliefs are derived from the moral ideas about deceiving that were presented in the previous paragraph. He argues that rather than describe the actual behaviour when deceiving (*descriptive* function), stereotypes of the deceiver's behaviour may intend to promote sincerity (*prescriptive* function): society transmits to each new generation "that lying will make the child feel bad, that the child's lies will be transparent, and that deceit will be more severely punished than any acknowledged transgression. The hope is that lying will be deterred or (at least) that the caregiver's prophesies of shame will be self-fulfilling. By vilifying deception, stereotypes of the liar are designed to extend the reach of societal norms to actions that go unwitnessed" (Global Deception Research Team, 2006, p. 70). It is intended that children internalise such notions, believing that lying is transparent, and growing up with the fear of being discovered if they lie, and thus they become honest adults. The children's myth of Pinocchio is a splendid example of these notions (and, incidentally, contributes to this socialising process).

As a likely result of this popular mythology, people have a strong belief that lying can be detected from clearly visible behavioural indicators (e.g., Global Deception Research Team, 2006; Masip & Herrero, 2015; Strömwall, Granhag & Hartwig, 2004), even though there are other types of information that are much more revealing indicators of deception (Blair, Levine & Shaw, 2010; Masip & Herrero, 2015; Park, Levine, McCornack, Morrison & Ferrara, 2002). Scientists have also succumbed to the idea that observable behaviour reveals deception. For example, over four decades ago Ekman and Friesen (1969a) proposed their famous "leakage hypothesis", which holds that emotions whose facial expression is hidden or masked with the expression of an alternative emotion may "leak", revealing the true feelings of the communicator. This gave rise to an abundant line of research on real and fake smiles, controllable versus uncontrollable facial movements, the transparency of the face versus the body during deception, and the renowned facial micro expressions (e.g., Ekman, 2009).

Similarly, Zuckerman, DePaulo and Rosenthal (1981; in Spanish, see Masip, Alonso & Herrero, 2006; Masip &

Garrido, 2000) contend that the act of deceiving is accompanied by observable behavioural correlates. They propose that people may, when deceiving, experience arousal (i.e., psycho-physiological activation), certain emotions (either caused by the act of lying itself, such as guilt, shame or fear of being discovered, or linked to the specific topic of the lie), a higher cognitive load (because lying is more complex than telling the truth) or, being aware of lying and of their audience, they may try to control their behaviour in order to inhibit the supposed indicators of deception. As shown in Table 1, each of these four elements can lead to certain observable behaviours, according to Zuckerman et al. (1981).

Buller and Burgon (1994) also support the display of behavioural indicators of deception. For them, deception is a form of persuasive communication and, as such, it includes strategic and deliberate behaviours to manipulate information, to give the impression of telling the truth and, essentially, to be convincing. However, the strategic use of these behaviours can become an indicator of deception for an experienced detector (Table 1). Furthermore, along with these strategic behaviours, the deceiver will involuntarily show tell-tale non-strategic leakage(Table 1).

Finally, more recently, DePaulo et al. (2003) presented a complex theoretical framework as the background of a meta-analysis that examined the discriminative value of a number of potential deception cues. They hypothesised that, in comparison with truth tellers, liars would be less forthcoming (which would be reflected in 14 specific behavioural cues; see DePaulo et al., 2003), their tales would be less compelling (65 cues), they would be less positive and pleasant (18 cues), more tense (12 cues) and their statements would have fewer ordinary imperfections and unusual contents (19 cues).

In short, the different traditional theoretical perspectives in deception detection agree on the idea that deceiving leads, ultimately, to the emergence of certain behavioural tell-tale signs. From this perspective, everything the detector has to do is to scrutinise the behaviour of the communicator, because if the communicator is lying this will inevitably end up showing in their behaviour.

As we will see below, this assumption has proved to be wrong. Efforts accumulated over more than half a century of research on deception detection have failed in the search for the "Holy Grail" of deception: the behaviour or cluster of behaviours that enable us to determine with certainty whether someone is lying or telling the truth.

AWAKENING FROM A DREAM

The developments produced since the 1970s in meta-analytic techniques have enabled considerable progress to take place in the behavioural sciences. A meta-analysis (e.g., Botella & Gambara, 2006; Sanchez-Meca & Botella, 2010) is a quantitative integration of the extant research regarding a specific scientific question (for example, the question "What are the behavioural indicators of deception?"). It involves using certain statistical procedures that facilitate: (a) the translation of the results of disparate studies that may have used different scales into a "common measure" (the effect size or magnitude); (b) the weighting of these effect sizes such that the most representative samples "have more weight"; and (c) the analysis of moderator variables, i.e., answering questions such as "Under what conditions are the differences greater?" or "When are they/are they not significant?"

Meta-analyses present a number of advantages over traditional narrative reviews (in which the authors read the relevant literature and make their own critical analysis); these include the following (see, e.g., Lipsey & Wilson, 2001; also Cumming, 2012): (a) a meta-analysis is extremely systematic and meticulous; every step is justified and documented and can be scrutinised and replicated; (b) it is more rigorous and reliable than narrative reviews (see Cooper & Rosenthal, 1980) or than simply calculating the proportion of relevant studies with statistically significant vs. not significant effects ("vote counting"); (c) it enables us to detect relationships that remain hidden with narrative reviews and "vote counting" (because sampling error is reduced, which increases the accuracy of the estimate; furthermore, the meta-analysis allows for moderator analyses); (d) it allows us to synthesise many studies with seemingly disparate results, providing a unitary response to a scientific question; and (e) it allows the neophyte to "catch up" in a particular area of science, thereby becoming an indispensable tool in present times, when the volume of scientific research is overwhelming and is growing exponentially. (For additional advantages in terms of scientific progress, see Chan & Arvey, 2012).

Research into deception detection has been accumulating for decades and has, very often, led to disparate and seemingly contradictory results. For these reasons, it can benefit from the use of meta-analysis. This may allow us to obtain unitary answers to the questions examined, as well as to identify the relevant moderators.

While some of the literature on deception detection was meta-analysed in the 1980s by Robert Rosenthal and colleagues (e.g., DePaulo, Zuckerman & Rosenthal, 1980a, 1980b; Zuckerman et al., 1981; Zuckerman & Driver, 1985), in the last decade, the increased methodological sophistication of meta-analyses and the increased number of studies have helped to achieve more

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TABLE 1
PROCESSES INVOLVED IN THE ACT OF LYING AND POSSIBLE BEHAVIOURAL INDICATORS OF DECEPTION, DERIVED FROM THESE PROCESSES, ACCORDING TO THE MODELS BY ZUCKERMAN ET AL. (1981), AND BULLER & BURGOON (1994)

Zuckerman, DePaulo & Rosenthal (1981)	Possible behavioural indicators
Arousal	✔ Higher voice pitch. ✔ Pupil dilation. ✔ Speech errors and alterations. ✔ Body movements. ✔ Laughing or smiling. ✔ Etc.
Emotions	✔ Emotion leakage (Ekman & Friesen, 1969). ✔ Adaptors.[a] ✔ Fewer illustrators.[b] ✔ Etc.
Cognitive Load	✔ Speech alterations (long response latency, many pauses, etc.). ✔ Shorter statement. ✔ Behavioural inhibition. ✔ Etc.
Behavioural Control	✔ Acting artificially or not spontaneously ✔ Discrepancies between controllable behaviours (over-inhibited) and uncontrollable behaviours (uninhibited). ✔ Intentional suppression of stereotypical deception cues. ✔ Etc.

Buller & Burgoon (1994)	Possible behavioural indicators
Strategic behaviours (voluntary)	✔ Uncertainty or vagueness. ✔ Nonimmediacy, reticence, and withdrawal (i.e., verbally and non-verbally distancing from the interlocutor to avoid being scrutinised). ✔ Disassociation, that is, verbally distancing from one's own declarations and actions, focusing instead on others (few linguistic self-references, more other-references, verbal nonimmediacy, etc.). ✔ Image- and relationship-protecting behaviours, such as nodding, smiling or supressing leakage cues.
Non-strategic leakage (involuntary)	✔ Arousal and nervousness behaviours (similar to those in the model by Zuckerman *et al.*, 1981). ✔ Indicators of the negative affect associated with the act of lying (emotional leakage, less positive feedback, reduced gaze, more negative statements, etc.) ✔ Signs of communicative difficulties (channel discrepancies, departure from normal communication style, etc.).

[a] *Adaptors* are behaviours such as scratching or fiddling absently with an object (Ekman & Friesen, 1969b).
[b] *Illustrators* are the gestures that accompany speech emphasising, clarifying or, ultimately, "illustrating" with gestures what is being said with words (Ekman & Friesen, 1969b).

robust and more comprehensive conclusions. These recent meta-analyses paint a bleak picture both in terms of the diagnostic utility of the alleged "deception indicators" and in relation to the ability of humans to detect lies. Their conclusions are, broadly speaking, as follows:

a) *The notion described in the preceding section that the act of lying is associated with behavioural indicators does not hold*. In an ambitious meta-analysis, DePaulo et al. (2003) examined the potential to discriminate between truth and deception of 158 possible indicators explored in previous research, finding that only a few actually discriminate. Moreover, their discriminative power depends on a large number of moderator variables, such as the motivation to deceive, whether the communication has been prepared or not, message length, degree of interaction, if the indicator is measured objectively or subjectively, and whether the deception/truth concerns a transgression or another issue. Shortly afterwards, Sporer and Schwandt (2006, 2007) published two meta-analyses on vocal and visible indicators of deception, reaching similar conclusions to those of DePaulo et al. Recently, another meta-analytic review has yielded similar conclusions regarding linguistic cues to deception (Hauch, Blandón-Gitlin, Masip & Sporer, 2014). In short: the myth that the deception is uniquely reflected in observable behaviour is false (see also Masip, 2005).

b) *If there is hardly any valid indicator to differentiate between truths and lies, then people's ability to identify sincere or false communications will be limited*. Indeed, meta-analyses by Aamodt and Custer (2006) and Bond and DePaulo (2006) show that people can identify as truthful or untruthful only 5.4 out of every ten messages received; this is barely more than the five messages one could classify correctly simply by throwing a coin (see Masip, 2005). Interestingly, people for whom lie detection is part of their normal work routine (police, judges, etc.) *do no better* than other people (Aamodt & Custer, 2006; Bond & DePaulo, 2006). In fact, Bond and DePaulo (2008) show in an innovative study that good detectors do not exist: people's variability in detection ability is negligible. In short, we humans are unable to determine whether someone is lying or telling the truth from observing their behaviour.

c) A series of meta-analyses by Hartwig and Bond (2011) repeatedly shows that the reason why detection accuracy is poor is not that humans judging someone else's veracity are attending to wrong indicators (i.e., to behavioural cues that are unrelated to deception). In fact, *we attend to valid indicators, but their validity is so poor that they do not enable high levels of accuracy*. Hartwig and Bond's logical conclusion is that training people to attend to valid behavioural cues cannot result in any improvement in detection accuracy. Instead, strategies that increase the behavioural differences between lies and truths should be used.

d) In fact, *the meta-analyses on the efficacy of training programs to detect lies/truths show only limited improvements* (Frank & Feeley, 2003). The meta-analysis by Hauch, Sporer, Michael and Meissner (2014) concluded that in order to be effective the training must focus on verbal cues. It is noteworthy that verbal cues have been the most discriminative in previous research (e.g., DePaulo et al., 2003). Hauch, Sporer, et al. also found that training programs increased the detection of lies but not of truths. This may be due to the emphasis placed in most of these programs on deception cues (not truthfulness cues) and the detection of lies (not of truths). This emphasis, rather than increasing people's capacity to discriminate between truths and lies, may increase the tendency for people to make deception judgments. This would lead to more lies being detected after the training, but not because of a higher ability but rather because of an increased lie bias.

This point was demonstrated in two experiments by Masip, Alonso, Garrido and Herrero (2009). At the beginning of the session, participants had to evaluate whether a series of video-taped communications were truthful or deceptive. Then the participants were either trained to identify purported deception cues (*deception group*), purported truthfulness cues (*truthfulness group*) or received no training at all (*control group*). Finally, the participants had to carry out a veracity-assessment task similar to the first one. The number of deception judgments made after the training where compared with those made before the training. Analyses revealed that deception judgments increased for the deception group, decreased for the truthfulness group, and did not change significantly for the control group. Moreover, the perception (measured by self-reports) of the training cues was related to the judgments. In short, training programs may bias judgments rather than increasing accuracy. In fact, the meta-analysis by Hauch, Sporer, et al. (2014)

shows that training programs to detect lies increase the detection of lies much more than they increase the detection of the truth, whereas training programs to detect the truth only increase the detection of the truth, but not the detection of lies.

In short, then, meta-analytical research reveals that there are few behavioural indicators that enable us to differentiate between truths and lies, and that their discriminative value changes from one situation to another. This means that both the general population and supposed deception detection "experts" reach accuracy levels hardly above chance, and training programs may have only limited effectiveness (and may bias judgments rather than increasing accuracy). All of this evidence led to the conclusion that research on verbal and nonverbal indicators of deception was at a dead end and a change of direction was necessary.

This shift has followed two different directions (e.g., Levine, 2014). The first direction, the majority direction, is based on the idea that *if the behavioural differences between truths and lies are small, let us do something to magnify them so that they become clearly visible.* This is Hartwig and Bond's (2011) proposal mentioned above. Note that this approach is still based on the examination of behavioural indicators of deception, but, unlike the traditional view, it is no longer expected that the sender will show these indicators spontaneously, or that it is enough for the receiver to just pay attention to the communicator's behaviour. On the contrary, the receiver must take an active role, he or she must *do something* for the behavioural signs of deception to manifest (see, e.g., Vrij & Granhag, 2012). This represents a major change of direction and brings deception detection research closer to the investigative interviewing and interrogation fields.

The second direction, the minority and less visible direction, is based on the reasoning that *if the behavioural differences between truths and lies are small, then we should look for non-behavioural differences.* More specifically, there may be contextual or situational indicators that enable us to infer deception (e.g., Blair et al., 2010; Blair, Levine, Reimer & McCluskey, 2012).

In this text, divided into two separate articles, we describe these two new directions in detail. Our goal is to outline the new approaches in the verbal and non-verbal detection of deception.[1]

THE ACTIVE INTERVIEWER
The Behaviour Analysis Interview

While the idea that the detector must take an active role in magnifying the differences between truths and lies has been strongly advocated recently, it is not actually an entirely new idea. In fact, for several decades the US company John E. Reid and Associates has promoted the Behaviour Analysis Interview (BAI). This is a form of interview to discriminate between innocent suspects (who tell the truth during the interview) and guilty suspects (who lie). To do this, suspects are asked a series of 15 questions that can be adapted to any type of crime (Table 2). The promoters of the BAI anticipate different reactions from innocent and guilty individuals (see Inbau, Reid, Buckley & Jayne, 2013). For example, in response to the first question, "What do you think is the purpose of this interview?" they expect a guilty individual to offer a naive or evasive answer or make a vague comment, and they expect an innocent person to give a direct answer and use realistic language. The reason is that, during the interview, guilty individuals (relative to innocent individuals) will feel more uncomfortable, will be less willing to help the police and will try to conceal their knowledge of the offence (Horvath, Blair & Buckley, 2008; Vrij, 2008). In contrast, innocent individuals will be willing to help because they will experience the "Sherlock Holmes effect" (Horvath et al., 2008), that is, they know they did not commit the crime, wonder who did commit it, want to help the police to solve the case and are willing to share their suspicions.

The BAI is part of the Reid Technique of Interviewing and Interrogation, marketed by John E. Reid and Associates. The Reid Technique is the most used method of police interrogation: it is used mainly in the USA but also in Germany, Saudi Arabia, Belgium, Canada, South Korea, UAE, Japan, Mexico and Singapore (Blair & Kooi, 2004). John E. Reid and Associates state on their website that more than half a million professionals from public and private security organisations have attended their training programs. The *New Yorker* journalist Douglas Starr (2013) states that "Today, John E. Reid & Associates, Inc., trains more interrogators than any other company in the world. Reid's clients include police forces, private security companies, the military, the FBI, the CIA and the Secret Service" (p. 42).

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[1] There is another new avenue of inquiry, outside the thematic boundaries of this review, which focuses on detecting lies about future intentions rather than past events. The interested reader is referred to Granhag and Mac Giolla (2014).

TABLE 2
BAI QUESTIONS AND ANSWERS
ATTRIBUTED TO GUILTY AND INNOCENT SUSPECTS

Question	General Phrasing	Guilty Reactions	Innocent Reactions
1. *Purpose*	What is your understanding of the purpose for this interview?	Naïve or evasive reply, vague comment.	Direct response, realistic language.
2. *History/You*	Did you commit this crime?	Bolstered response, delayed response, evasive response. Crossing of the legs, shifting in the chair, preening behaviours.	Emphatic denial, immediate denial. Leaning forward in chair, direct eye contact, use of illustrators.
3. *Knowledge*	Do you know who committed the rime?	Geographical or emotional distancing from the crime, denial (without much thought) of any knowledge regarding who the guilty person might be, evasive answer.	Intimation of a suspicion, apology for own denial, statement that one has been thinking about who the culprit might be. The innocent suspect sounds sincere
4. *Suspicion*	Who do you suspect might have committed the crime?	Resistance to name anyone, or tendency to name the other suspect (if there are only two suspects), and difficulty in giving reasons for pointing the finger at the other suspect.	Tendency to name someone and give credible reasons for pointing the finger at that person.
5. *Vouch*	Is there anyone you could vouch for, anyone who you are certain id not commit the crime?	Non-committal response, or evasive response.	Willingness to name specific individuals.
6. *Credibility*	Do you think a crime was really committed?	Suggestion of unrealistic possibilities that imply that the event was not a crime.	Acknowledge that a crime has been committed.
7. *Opportunity*	Who would have had the best opportunity to commit the crime?	Naming of unrealistic suspects, or claim that no one had any opportunity to commit the crime	Acknowledgement of one's own opportunity to commit the crime.
8. *Attitude*	How do you feel about being interviewed regarding this crime?	Negative attitude (voicing negative feelings).	Positive attitude (happy to help).
9. *Think*	Have you ever thought about committing this crime?	Acknowledgement of these thoughts, use of qualifications (e.g., "Not *really*").	Unambiguous denial of these thoughts.
10. *Motive*	Why do you think someone committed this crime?	Reluctance to speculate about the motives for the crime, or a very detailed or specific answer. Posture shifts in the chair or anxiety-reducing behaviours.	Willingness to suggest reasonable motives for the crime, appearing comfortable while discussing the motives.
11. *Punishment*	What do you think should happen to the individual who committed the crime?	Suggestions of indulgent treatment, or evasive response to avoid suggesting any specific punishment (e.g., "It's not for me to decide about the punishment")	Suggestions of reasonably harsh punishments.
12. *Second Chance*	Are there any circumstances under which you would be willing to give the person who committed this crime a second chance?	Willingness to give a second chance to the guilty person, evasive response ("It's hard to say"), or reference to conditions or ircumstances	Unwillingness to give a second chance.
13. *Objection*	Tell me why you would never commit this crime.	Third-person response ("That's illegal"), references to future negative consequences, or to external factors (e.g., video surveillance systems).	First-person response in which a personal trait is mentioned (e.g., "Because I am not an evil person"), or reference to present responsibilities or past accomplishments (not risking everything one has worked so hard for one's entire life).
14. *Results*	Once the investigation has finished, what do you think the results of our investigation will be concerning your involvement in this case?	One-answer responses (e.g., "Clean"), uncertainty, evasive responses, or suspicion that the investigation will show negative results together with accusations against another person or persons.	Confidence in being found innocent.
15. *Tell Loved Ones*	Did you tell anyone about this interview?	Denial of having told any loved one about the interview, or having played down the interview when speaking to the loved person about it. If asked about the loved one's reaction, the guilty suspect will respond that the other person did not react positively or negatively, or that the other person asked whether he or she [the suspect] had committed the crime.	Acknowledgement of having told loved ones about the investigation or about the interview.

Note. Based on Inbau et al. (2004). See the original reference for more details and examples. The empirical research described in this text questions the usefulness of these indicators in identifying guilty or innocent suspects.

When someone is suspected of being guilty, they are subjected to the BAI. If the interviewer concludes that they are lying, from observing the guilt indicators of the BAI, then the so-called "nine steps of interrogation" of John E. Reid and Associates are applied. This is a harsh interrogation –aimed at obtaining a confession– that is psychologically coercive, so it can lead to false confessions (Kassin & Gudjonsson, 2004; Masip & Garrido, 2006). Consequently, if the BAI indicators of deception/guilt or truthfulness/innocence are not valid, the suspect may be in serious trouble.

Strangely, the validity of these indicators has barely been studied. The staff of John E. Reid and Associates themselves conducted two studies that seemingly lend support to the BAI's ability to distinguish between guilty and innocent suspects (Blair & McCamey, 2002; Horvath, Jayne & Buckley, 1994). However, these studies have been questioned due to a large number of methodological limitations (see Alonso, Masip, Garrido & Herrero, 2009; Masip, Herrero, Garrido & Barba, 2011; Vrij, 2008; Vrij, Mann & Fisher, 2006). These limitations include uncertainty about the real innocence or guilt of the suspects. To address this problem, Vrij et al. (2006) conducted a laboratory study in which 20 participants committed a mock crime and another 20 did not. They were all then interviewed using the BAI. For the vast majority of the questions there was no difference between the reactions of guilty and innocent participants. In the few cases where there was a difference, it was opposite to the predictions of John E. Reid and Associates (Vrij et al., 2006). In short, the BAI supposed indicators of guilt/deception and truth/innocence do not work.

Advocates of the BAI may question Vrij et al.'s (2006) findings on the grounds that they were found in a laboratory study with a simulated crime. Of course, in such circumstances the stakes for the "guilty" person are much lower than those for a real offender during an actual police interview. However, more recently, the BAI has also been questioned for other reasons. Specifically, we, the present authors, have shown in a series of studies that the BAI indicators of guilt and innocence are popular common-sense beliefs rather than a specialised form of knowledge (Masip, Barba & Herrero, 2012; Masip & Herrero, 2013; Masip et al., 2011). In a first experiment (Masip et al., 2011, Study 1), participants were assigned to the *informed group*, which received information on the questions of the BAI and the indicators of guilt and innocence in the responses to each question, or to the

non-informed group who did not receive this information. Then all of the participants read the transcripts from two BAIs, translated from Inbau et al.'s (2004) book. Participants had to indicate which of the two transcripts corresponded to the guilty person. Virtually every participant in the informed group was able to identify the guilty individual, but 69% of participants in the non-informed group were also able to do so. This percentage is significantly higher than the 50% expected by chance.

This study has some weaknesses, such as the possibility that these interviews, having been included as examples in the manual, were prototypical (with many very clear indicators) rather than typical. This may have artificially increased accuracy. In addition, we decided that, in order to determine whether the innocence or guilt indicators of the BAI are common sense, it is more appropriate to examine these indicators directly rather than examining classification rates. Consequently, we conducted the second and third studies (Masip et al, 2011, Study 2; Masip et al, 2012). In these studies we examined whether people who did not know about the BAI deemed the behaviours considered to be indicators of guilt by Inbau et al. (2004) as more indicative of guilt than those behaviours that Inbau et al. considered to be indicators of innocence. To do this, we constructed a questionnaire in which we presented the case described by Inbau et al. (2004, p. 174) about an arson attack on a warehouse. We indicated that there was a suspect, named Javier, who was interviewed. The subsequent pages detailed the questions that Javier was supposedly asked during the interview. These were the 15 questions of the BAI. After each question, there was a list of all of the possible reactions (both innocent and guilty) to this question according to Inbau et al. (2004). Every possible reaction was accompanied by a numerical scale from 1 (innocent) to 6 (guilty) where the participants had to indicate the extent to which Javier would be innocent or guilty if he had given this particular response.

In the second study, this questionnaire was applied to 83 students. In the third study, it was applied to 35 new members of the National Police Force of Spain and 77 veteran officers from the same police force (with a mean of 22 years of police experience). About half of the veteran police officers had experience in police interrogations and interviews.

We found the guilt scores were significantly higher for responses indicating guilt according to Inbau et al. (2004) than for responses indicating innocence according to

Inbau et al. Additional analyses showed that the differences between samples (students, novice officers, and veteran officers) did not reach statistical significance. Among veteran officers, there was also no difference between those with interviewing experience and those without such experience. In other words, the beliefs of *all of the groups* regarding the BAI guilt and innocence indicators coincided with the ideas of Inbau et al. The lack of differences between the groups shows the robustness of the findings, because the groups differed not only in terms of profession or years of experience, but also in terms of gender and age.

In essence, then, the BAI indicators of innocence or guilt are wrong (Vrij et al., 2006) and reflect shared common-sense notions (Masip et al., 2011, 2012). Consequently, BAI training makes little sense, since it teaches people what they already "know" (or believe) which, furthermore, is erroneous. But these findings have a rather more disturbing implication. If everyone shares John E. Reid and Associates' beliefs regarding the BAI guilt and innocence indicators, then real crime suspects will also share them and can manipulate their behaviour during a BAI in order to appear innocent instead of guilty.

Our fourth study examined this issue (Masip & Herrero, 2013). Again, we developed a questionnaire in which the arson case by Inbau et al. (2004) was described, and participants were asked to imagine vividly that they were innocent or guilty suspects about to be interviewed by the police. The 15 questions of the BAI were then presented, each one followed by all of the possible answers according to Inbau et al. After each answer, participants had to indicate the extent to which they would give this answer during the interview on a scale ranging from 1 (I would not give it) to 6 (I would give it). According to Inbau et al., the innocent person would present more answers of innocence than guilt, and the guilty person would do the opposite. This prediction was supported for only one question (Question 6) out of the 15 BAI questions. In general, regardless of whether participants were in the innocence or guilt condition, they indicated that they would give responses indicative of innocence significantly more than responses indicative of guilt. This calls into question the usefulness of the BAI in identifying the innocent and the guilty, and shows that the BAI may lead to erroneous classifications that may ultimately result in false confessions (see Leo & Drizin, 2010).

In short, then, although it is true that the aim of the BAI is for the interviewer to take an active role, asking questions to produce certain distinctive reactions in the deceiver (or culprit), it is also true that it is not a good tool for deception detection. This is because the indicators it attends to are not discriminative (Vrij et al., 2006), are based on popular shared beliefs (Masip et al., 2011, 2012) and can be manipulated by suspects seeking to look innocent (Masip & Herrero, 2013). Interview protocols to generate different reactions in truth tellers and liars must be based on solid theoretical models and must be supported by empirical research. Next we describe a theoretical framework upon which these protocols can be based. Then in the second part of this essay (published as a separate article in the same issue of this journal), we describe some of these protocols, as well as part of the empirical research carried out on them.

Cognition and Deception

The theoretical framework that we referred to in the previous point may come from cognitive psychology (Blandón-Gitlin, Fenn, Masip & Yoo, 2014). Telling a lie (unless it is a very simple or rehearsed one) may require more mental effort than telling the truth. This is because in order to lie one must *inhibit the automatic response*, that is, the truth. If someone asks, "What is your name?" the name that comes swiftly to mind is one' own; if one wishes to give a different one, the first thing one must do is block it. In addition to inhibiting the truth, lying also involves creating an alternative "truth", i.e., *inventing a false story* (or coming up with a false name); this requires more mental effort than simply describing reality. In inventing this falsehood, one must assess whether there is any evidence contradicting it, or what knowledge the recipient of the lie may have that questions it; we must ensure that *our story does not contradict this evidence and knowledge*. We also have to *avoid behaving suspiciously*: our story must sound credible and our behaviour must seem normal. We must also *attend to the reactions of the interlocutor and adjust our own behaviour* if he or she seems suspicious. And we must not forget to *memorise the details of the story* that we are inventing, in order not to contradict ourselves if we have to repeat the story again in the future. If we also are afraid of being discovered or feel guilty about lying, these emotions will interfere with our concentration. In short, the deceiver must carry out a variety of complex tasks simultaneously, and this may deplete the deceiver's cognitive resources. By contrast, although a truthful person may also be involved in some of these tasks (e.g.,

truth tellers are also interested in sounding plausible and not having their sincerity questioned), they do not do them as intensely as the deceiver does.

In line with these considerations, several lines of research coincide in showing that lying <u>actually requires more mental effort</u> than telling the truth. Several *neuroimaging* studies show that the brain areas related to working memory, conflict and response inhibition, and multitasking are active when deceiving (see, e.g., the meta-analytic reviews of Christ, Van Essen, Watson, Brubaker & McDermott, 2009; Farah, Hutchinson, Phelps & Wagner, 2014; and Lisofsky, Kazzer, Heekeren & Prehn, 2014). The areas related to moral reasoning and the theory of mind are also activated when lying (Lisofsky et al., 2014). In addition, studies in *cognitive psychology* have found that, in situations where inhibiting the dominant response is more difficult, lying requires longer reaction times and involves more errors than telling the truth (e.g., Debey, Verschuere & Crombez, 2012; Van Bockstaele et al, 2012; Visu-Petra, Miclea & Visu-Petra, 2012; Visu-Petra, Varga, Miclea & Visu-Petra, 2013), and if response inhibition is facilitated one can deceive more effectively and certain behaviours that might suggest deception are successfully suppressed (Fenn, Blandón-Gitlin, Coons, Pineda & Echon, 2014). Likewise, Hauch, Blandón-Gitlin, et al.'s (2014) meta-analysis on linguistic cues to deception examined with computer programs supports the notion that lying is cognitively more complex than truth telling, as false stories were found to be shorter, less elaborate and less complex than truthful accounts.

It is no wonder then that, spurred on by these studies (or their predecessors), a number of researchers have (a) discussed about the role that certain cognitive processes may play during deception, (b) pointed out the relevance of certain extant cognitive psychology models for the deception research area, and even (c) developed specific cognitive-based models for this area. These models can be useful in making predictions regarding deception indicators; one example is Sporer and Schwandt's (2006, 2007) working memory model. Unfortunately, a detailed account of all of these contributions would divert us from the main theme of this text, as well as lengthening it excessively, so we refer the interested reader to the articles by Gombos (2006) or by Walczyk, Igou, Dixon and Tcholakian (2013), as well as to the September 2014 special issue of the *Journal of Language and Social Psychology*, devoted largely to presenting and discussing McCornack, Morrison, Paik, Wisner and Zhu's (2014)

cognitive model of deception. Here we will just briefly explain Walczyk and his colleagues' *Activation-Decision-Construction Model* (ADCM) (Walczyk, Griffith, Yates, Visconte, Simoneaux & Harris, 2012; Walczyk, Mahoney, Doverspike & Griffith-Ross, 2009; Walczyk, Roper, Seemann & Humphrey, 2003; Walczyk et al., 2005), which we consider of interest due to its great detail and its high degree of articulation.

As its name implies, the model consists of three phases called *Activation, Decision* and *Construction*. These are successive operations that occur in working memory (WM), even though they require access to information stored in long term memory (LTM). Let us imagine that a question is asked which can be responded truthfully or deceptively. In the *Activation* phase, this question enters the WM and the relevant information is strongly activated in the semantic memory (which stores information about the world) and the episodic memory (which stores autobiographical information), which are components of LTM. The truth is then transferred from LTM to WM. This activation phase is usually automatic, although it may require some cognitive effort if the memory relevant to the truth has not been accessed for a long time. The *Decision* phase is intentional. The decision is made as to whether or not disclosing the truth is convenient. In making this decision, the episodic and semantic information activated by the question and by the social context is taken into account. If the potential deceiver anticipates considerable negative consequences of truth telling, then he or she will decide to deceive and will go on to the next phase, the *Construction* of the lie, which is also intentional. Here, the decision to deceive will establish an inhibitory link to prevent the utterance of the truth; nevertheless, as the truth is active in LTM, it can be used (because of its links with multiple semantic and episodic nodules) to construct a plausible lie. The social context is also relevant in lie construction: one must consider, among other things, the (estimated) intelligence of the receiver, whether or not the receiver is suspicious, etc. Implausible or very improbable lies, or those that may damage the liar will be inhibited. Finally, one of the possible fictions, the one having received the greatest activation will be transmitted in the act of lying. The speed of lie construction will depend on the ease of access to linguistic codes in memory and on their manipulation. Finally, the lie is issued verbally (see Walczyk et al, 2003).

Note that the decision and construction components involve operations that use cognitive resources; therefore,

these components must increase reaction time. That is, response latency (the time between the end of the question and the beginning of the response) must be longer when lying than when telling the truth. This and other predictions derived from ADCM have been empirically supported in a series of studies conducted by Walczyk and his colleagues. It has been shown that indeed, the reaction time (RT) or response latency is longer when deceiving than when telling the truth, that individual differences in the ability to retrieve lexical information from memory correlate with RT when lying but not when telling the truth (which supports the role of the *Construction* phase), that the speaker's social skills have no effect in answering questions that require yes/no answers, but in questions that require extended responses the more socially skilled liars are more difficult to detect (on the basis of RT) than less socially skilled liars (social skills are relevant in order to *construct* a convincing lie), that lying is more difficult if the lie contradicts common truths (inhibiting the truth is more difficult), etc. (see Walczyk et al., 2003, 2005, 2009, 2012).

Recently, Walczyk, Harris, Duck and Mulay (2014) have published a much richer and more in depth version of this model, which they have called *Activation-Decision-Construction-Action Theory* (ADCAT). The new version emphasises the role that the theory of mind[2] plays throughout the whole process. It also considers the role of motivation and the emotions, presents a mathematical model of the quasi-rational making of the decision to deceive, presents the "plausibility principle", which specifies the possible strategies to be used in the lie construction phase, and gives greater prominence to the *Action* phase, that is, the uttering of the deception. It is a very plausible theoretical model, with an extreme level of detail and with the potential to guide both theoretical research on the act of lying as well as applied research on lie detection.

In short, the new approaches to detect deception, that involve the interviewer taking an active approach to maximise the differences between liars and truth-tellers, must be based on well-established and empirically tested theoretical models (Blandón-Gitlin et al., 2014). Cognitive models exist that meet the necessary requirements, among which Walczyk and colleagues' ADCAT is noteworthy.

These models are based on the premise that deceiving is cognitively more complex than telling the truth, so that under certain conditions (which can be created by the interviewer) the lie will be revealed in the form of longer reaction times and other observable signs of cognitive load.

In the second part of this essay, which appears in this same issue of *Papeles del Psicólogo*, we will present two interview models to detect deception grounded on the complexity that lying entails: the TRI-Con interview (*Time Restricted Integrity-Confirmation*; Walczyk *et al.*, 2005) and the artificial induction of cognitive load in the interviewee (Vrij et al., 2008). Although both are based on the idea that lying is cognitively more complex than truth telling, only the TRI-Con interview is based on a detailed and well-articulated cognitive model of deception--Walczyk and colleagues' ADCM.

In addition to presenting these forms of active interviewing, we will also describe other interviewing approaches that are based on different principles. Finally, we will conclude this essay with a summary of research on contextual or situational indicators of deception, which have been proposed as an alternative to behavioural cues. With all this, we hope to give the reader a sufficiently detailed overview of the new developments that are occurring in this exciting area of legal psychology that has an undeniable applied relevance.

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[2] "The ability to infer others' mental states, thoughts and feelings… and reason about their beliefs, desires, intentions and knowledge" (Walczyk *et al.*, 2014, p. 25). Theory of mind is necessary in order to be able to give a false impression to others. See, for example, Frith and Frith (2005).

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