CAN THE UNCONSCIOUS BOOST LIE DETECTION ACCURACY?

Chris N. H. Street[1]

Department of Behavioural and Social Sciences,

University of Huddersfield, Huddersfield, UK.

International Research Centre for Investigative Psychology,

University of Huddersfield, Huddersfield, UK.

Miguel A. Vadillo

Primary Care and Public Health Sciences,

King's College London, London, UK.

ABSTRACT

Recently, a variety of methods have been used to show that unconscious processes can boost lie detection accuracy. This article considers the latest developments in the context of research into unconscious cognition. Unconscious cognition has been under attack in recent years because the findings do not replicate, and when they do reliably improve performance they fail to exclude the possibility that conscious processing is at work. Here we show that work into unconscious lie detection suffers from the same weaknesses. Future research would benefit from taking a stronger theoretical stance and explicitly attempting to exclude conscious processing accounts.

Key words: Deception detection; Focal account; Implicit cognition; Unconscious.

If your intuition tells you that someone is lying, should you trust that feeling? This article considers the recent advances in unconscious lie detection, and asks whether the unconscious can help detect a lie. We argue that research supporting an unconscious account of lie detection parallels with research on unconscious cognition inasmuch as it either (i) fails to exclude a conscious explanation of the increased accuracy, or (ii) fails to find an accuracy difference between methods that supposedly access conscious versus unconscious thinking. Before concluding, minimum criteria are offered that must be met to demonstrate evidence of unconscious lie detection.

The Unconscious Mind Under the Spotlight

There is a long tradition of research in psychology that attributes basic tasks like word and object recognition to the operation of fast and efficient processes that demand no conscious supervision (e.g., Shiffrin & Schneider, 1977). These processes are automatic in the sense that they are efficient and cannot be easily controlled. Furthermore, they are typically assumed to operate below the level of awareness and, consequently, considered instances of unconscious processes. More recently, it has been claimed that the scope of the unconscious may not be limited to such simple tasks. An increasingly voluminous literature suggests that social behavior is influenced by subtle environmental cues that we are hardly aware of (see Bargh, 2014).

Unfortunately, much of the evidence on which this framework is based has been difficult to replicate or is open to alternative, trivial explanations. In fact, much of the so-called replication crisis in psychology (Open Science Collaboration, 2015) was been triggered by the failure to replicate key findings in the unconscious priming literature. For instance, in an experiment that remains the most popular example of behavioral priming, Bargh, Chen, and Burrows (1996) found that participants walked

down a hallway more slowly when the concept of 'elderly' was primed. However, replication attempts have failed to find such an effect and suggest that the seminal finding might be due to experimenter demand effects (Doyen, Klein, Pichon, & Cleeremans, 2012). Similarly, Caruso, Vohs, Baxter, and Waytz (2013) found that people are more likely to endorse capitalist values after being presented with stimuli related to money. This influence has also been attributed to unconscious processes. But the effect has proven difficult to replicate (Rohrer, Pashler, & Harris, 2015) and there are concerns that the published effect sizes are inflated by publication or reporting biases (Vadillo, Hardwicke, & Shanks, 2016).

In a similar vein, Dijksterhuis and colleagues found that people make better decisions after spending a short time distracted on a secondary task (e.g., solving word search puzzles) than after spending an equal amount of time deliberating (Dijksterhuis, Bos, Nordgren, & van Baaren, 2006), thereby questioning the common-wisdom view that conscious thinking results in better decisions. These findings form the foundations of unconscious thought theory (UTT; Dijksterhuis et al., 2006). Despite the popularity of this framework, the growing number of failed replications suggests that these results are elusive (Nieuwenstein et al., 2015).

In the present article, we would like to propose that similar shortcomings apply to the area of unconscious lie detection. Given the debate about the reliability and theoretical interpretation of the wider area of unconscious cognition, a review of the unconscious contribution to lie detection is in order. In the following sections we show that research on unconscious lie detection is not immune to the criticisms that have been directed towards behavior priming experiments and UTT.

Indirect Lie Detection

The majority of research on unconscious lie detection comes from the indirect method (DePaulo & Morris, 2004). In these studies, raters are not told that the speaker may be lying. Instead, they only judge whether or not the speaker is, for example, thinking hard, or ambivalent, or tense. Afterwards, the experimenter converts the 'thinking hard' ratings into lie judgments and 'not thinking hard' into truth judgments. These converted judgments separate liars and truth-tellers more accurately than do direct judgments of lie or truth. Because indirect raters are not asked to consciously consider whether the speaker is lying, and yet show higher accuracy than direct lie-truth judgments, the picture by 2004 was that there exists an unconscious, hidden ability to detect lies (DePaulo & Morris, 2004).

However, the relatively high accuracy is not always observed (Bond et al., 2014), and when accuracy is high it can be accounted for without needing to lay claim to some inaccessible form of processing. In fact, there is a circularity in the method that prevents claims to the unconscious. The experimenter chooses a behavior known to be diagnostic of deception, e.g., if the speaker is thinking hard or not. Assuming liars think harder than truth-tellers, then judgments of this clue alone -- without any additional conscious or unconscious knowledge of deception -- will necessarily separate out liars and truth-tellers (Street & Richardson, 2015). Accuracy with the indirect method is caused by focusing raters on useful clues that the experimenter chose to be rated, not the participants' unconscious thinking.

A meta-analysis recently found that in roughly 80% of the studies they reviewed, indirect judgments gave accuracy rates *lower* than direct judgments (Bond et al., 2014). Those indirect studies that achieved relatively high accuracy rates made use of clues (such as cooperativeness) that a large meta-analysis has shown to be a more reliable clue to deception (DePaulo et al., 2003). Those studies that achieved a

low accuracy rate made use of clues unlikely to be indicative of deception, such as whether the face is being shielded by the speaker or not. If accuracy rates are caused by focusing attention on useful clues to deception, and not unconscious processing, then it should be possible to steer *conscious* judgments by having the participant also rate or attend to a useful clue. A recent study found precisely that (Street & Richardson, 2015).

It seems clear that the findings can be explained without the need of an unconscious process. More to the point, it is unclear how an unconscious account would be able to explain why the indirect method fails so often (Bond et al., 2014), and when it does give higher accuracy it is only when the behavior being consciously rated is a diagnostic one (Street & Richardson, 2015). We must put the indirect method to one side if we are to give serious consideration to unconscious processing. Unfortunately, the vast majority of evidence on unconscious lie detection comes from using that method.

Other Methods of Unconscious Lie Detection

This section shows that, where the evidence does not preclude the possibility of an unconscious ability, the findings either (i) offer no accuracy benefits for the unconscious or else (ii) are unable to exclude a conscious processing account. If supposed unconscious processes produce no discernable differences from conscious ones, for the sake of parsimony we should reject claims that there exists an additional, hidden process for the same reason that we should reject claims that there exists a third hidden process, or a fourth.

In a recent series of experiments, ten Brinke, Stimson, and Carney (2014) presented participants with videos of pleaders lying or telling the truth. When participants were explicitly asked to tell liars from truth-tellers, their guesses were no

better than chance. Yet ten Brinke et al. showed that, at an unconscious level, participants knew which pleaders were telling the truth and which ones were lying. For instance, presenting briefly (17 ms) the photograph of a truth-teller facilitated the categorization of words related to honesty. These results suggest that participants reacted differently to pleaders who lied and to pleaders who were telling the truth, even if they could not recognize this consciously.

These results have been the subject of criticism. Levine and Bond (2014) observed that participants' conscious guesses in this study were substantially lower than the accuracy rates found in similar studies. Although the size of 'unconscious' lie detection found by ten Brinke et al. (2014) looks large when compared with this poor baseline, it doesn't look so promising when compared with the accuracy observed in similar studies. In other words, the participants tested by ten Brinke et al. were not particularly successful at detecting lies unconsciously; rather, they were remarkably bad at detecting lies consciously. Additionally, a more sophisticated reanalysis of the dataset has found unconscious lie detection accuracy was no better than chance (Franz & von Luxburg, 2015).

More promising findings come from the use of thin slicing techniques. Thin slicing is a method of taking small sections of a speaker's statement and asking participants to judge those, rather than judging the full statement. Albrechtsen, Meissner, and Susa (2009) found that raters were more accurate judging thin slices than judging the full statement. However, a recent favorable review of the thin slicing method has since pointed out that, although the technique may improve interpersonal judgments, unconscious processing is only one of a number of possible explanations (Slepian, Bogart, & Ambady, 2014). In fact, that review concludes that the method improves interpersonal judgments in general because, analogous to indirect lie

detection (Street & Richardson, 2015), thin slicing focuses raters' attention to a particular set of clues: towards nonverbal information. This shift in attention will increase accuracy if there are useful nonverbal clues in the stimulus set, which may explain the increased accuracy in this particular study. If there are no useful nonverbal clues available, we might expect accuracy to decrease. Consistent with this, one recent study found decreased lie detection accuracy with thin slices (Street & Masip, 2015). This suggests that thin slices can promote (or hinder) lie detection not because they trigger unconscious processes, but simply because they divert attention away from unreliable (or valid) cues. It has been known for some time that visual behaviors are notoriously unreliable clues to deception (DePaulo et al., 2003). We might expect, then, that with many experiments exploring thin slicing, accuracy will be more often seen to decrease than increase. As yet, there are few published studies. At best, the support for an accurate but unconscious lie detection ability is inconclusive. At worst, thin slicing does not access the unconscious (Slepian et al., 2014), and even if it does, it should guide attention to nonverbal clues that are typically poor indicators of deception (DePaulo et al., 2003), and so should decrease accuracy.

A more theoretically oriented approach takes its lead from unconscious thought theory. The main claim of UTT is that the conscious mind is poorly equipped for handling large amounts of data and weighting them optimally. Decisions that put strong demands on the cognitive system are better dealt with by the less limited resources of the unconscious. Following this line of thought, more accurate lie-truth judgments can be made by distracting the conscious mind with an unrelated task. This prediction was tested by Reinhard, Greifeneder, and Scharmach (2013) who found that, indeed, participants were more accurate at telling liars from truth tellers after a period of distraction than after an equivalent amount of time of conscious deliberation

(see also Albrechtsen et al., 2009). Although these results are suggestive, a recent high-powered replication failed to reproduce them (Moi & Shanks, 2015). This failure to observe an unconscious thought advantage in lie detection is in line with the negative results of other attempts to replicate the key experiments supporting UTT (e.g., Nieuwenstein et al., 2015; Vadillo, Kostopoulou, & Shanks, 2015). Indeed, some studies find that distracting the conscious mind with a secondary task *decreases* lie detection accuracy (Feeley & Young, 2000).

The evidence reviewed so far does not provide convincing evidence for an unconscious ability to detect lies. The major paradigm in this area, indirect lie detection, typically results in poor accuracy rates (Bond et al., 2014), and accuracy appears to be causally related to the behavior that is being consciously judged (Street & Richardson, 2015). A conscious account seems better positioned to explain these findings. More contemporary approaches have been unable to show a reliable accuracy gain from using unconscious thinking, have employed methods that have not been shown to access the unconscious, and offer mixed findings that do not replicate with high powered studies.

What Would Evidence for The Unconscious Would Look Like?

Far from being a simple criticism of past research, our review highlights some paths for progressing unconscious lie detection. First and foremost, unconscious accounts of lie detection would benefit from adopting a *theoretical* stance. This contrasts with the typically adopted *methodological* stance, which begins from the use of tasks that may access unconscious processing without an underlying theory as to how or why the unconscious boosts accuracy on the task.

The basic tenets of the literature covered in the present review are consistent with some of the overarching concepts of implicit cognition research and dual-process

models. For instance, they dovetail with the idea that people typically have very little insight into the cognitive processes that guide their judgments and decisions (Nisbett & Wilson, 1977) and that an important part of these processes is the hands of an unconscious system that handles information in an automatic fashion (Stanovich & West, 2000). However, within the context of unconscious lie detection research, little effort has been done to further develop these general ideas into a well-articulated and detailed model (although see Reinhard & Sporer, 2010 for an initial exploration). Ideally, a good model of unconscious lie detection should (i) explain how it is that the unconscious is supposed to boost accuracy, (ii) generate numerically quantifiable and falsifiable novel predictions, and at the same time (iii) build upon an existing evidence base.

The studies conducted by Reinhard et al. (2013) on UTT are perhaps a good example of a theory-guided approach. Although UTT lacks sufficient empirical support, we think that it offers clear, testable predictions that allow for falsification. In contrast, the other lines of research discussed in the present article have been framed in general and vague terms, which makes it difficult to ascertain whether and when the theory is violated. As we have shown in the case of indirect lie detection, when there is no explanation of how the unconscious boosts accuracy, it may be that the 'unconscious' accuracy boost is actually the result of a conscious process. The thin slicing method, if it measures unconscious processing (cf. Slepian et al., 2014), sometimes improves accuracy and sometimes impedes it (Albrechtsen et al., 2009; Street & Masip, 2015). In the absence of a well-defined theory, it is impossible to determine whether these conflicting results can be accommodated by implicit models of cognition or not.

Conclusion

If only for sake of parsimony, we should not speculate about the existence of unobservable processes, hidden even from the person generating them. Not until it can be shown that a phenomenon cannot be explained by processes we already assume exist – conscious processes. The evidence for unconscious lie detection is so far lacking. Where a benefit is reliably seen, the effect can be readily interpreted in terms of conscious processes. There seems to be little evidence that "people know more about deception than it appears when experimenters ask them directly" (DePaulo, 1994, p. 85).

END NOTE

[1]Address correspondence to Chris N. H. Street, Department of Behavioural and Social Sciences, University of Huddersfield, Huddersfield, UK, HD1 3DH.

c.street@hud.ac.uk.

REFERENCES

Albrechtsen, J. S., Meissner, C. A., & Susa, K. J. (2009). Can intuition improve deception detection performance? *Journal of Experimental Social Psychology*, *45*, 1052-1055.

Bargh, J. A. (2014). Our unconscious mind. *Scientific American*, *30*, 30-27.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation of action. *Journal of Personality and Social Psychology*, *71*, 230-244.

Bond, C. F., Levine, T. R., & Hartwig, M. (2014). New findings in nonverbal lie detection. In P. A. Granhag, A. Vrij, & B. Verschuere (Eds.), *Detecting deception: Current challenges and cognitive approaches* (pp. 37-58). Chichester, UK: Wiley.

Caruso, E. M., Vohs, K. D., Baxter, B., & Waytz, A. (2013). Mere exposure to money increases endorsement for free-market systems and social inequality. *Journal of Experimental Psychology: General*, *142*, 301-306.

DePaulo, B. M. (1994). Can humans learn to do better? *Current Directions in Psychological Science*, *3*, 83-86.

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin*, *129*, 74-118.

DePaulo, B. M., & Morris, W. L. (2004). Discerning lies from truths: Behavioural cues to deception and the indirect pathway of intuition. In P. A. Granhag, & L. A. Strömwall (Eds.), *The detection of deception in forensic contexts* (pp. 15-40). Cambridge: Cambridge University Press.

Dijksterhuis, A., Bos, M. W., Nordgren, L. F., & van Baaren, R. B. (2006). On making the right choice: The deliberation-without-attention effect. *Science*, *311*, 1005-1007.

Doyen, S., Klein, O., Pichon, C. L., & Cleeremans, A. (2012). Behavioral priming: It's all in the mind, but whose mind? *PLoS ONE*, *7*, e29081.

Feeley, T. H., & Young, M. J. (2000). Self-reported cues about deceptive and truthful communication: The effects of cognitive capacity and communicator veracity. *Communication Quarterly*, *48*, 101-119.

Franz, V. H., & von Luxburg, U. (2015). No evidence for unconscious lie detection: A significant difference does not imply accurate classification. *Psychological Science*, *26*, 1646-1648.

Levine, T. R., & Bond, C. F. (2014). Direct and indirect measures of lie detection tell the same story: A reply to ten Brinke, Stimson, and Carney (2014). *Psychological Science*, *25*, 1960-1961.

Moi, W. Y., & Shanks, D. R. (2015). Can lies be detected unconsciously? *Frontiers in Psychology*, *6*. doi: 10.3389/fpsyg.2015.01221.

Nieuwenstein, M. R., Wierenga, T., Morey, R. D., Wicherts, J. M., Blom, T. N., Wagenmakers, E.-J., & van Rijn, H. (2015). On making the right choice: A meta-analysis and large-scale replication attempt of the unconscious thought advantage. *Judgment and Decision Making*, *10*, 1-17.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*(3), 231-259.

Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science*, *349* (6251), aac4716. doi: 10.1126/science.aac4716.

Reinhard, M. A., Greifeneder, R., & Scharmach, M. (2013). Unconscious processes improve lie detection. *Journal of Personality and Social Psychology*, *105*, 721-739.

Reinhard, M. A., & Sporer, S. L. (2010). Content versus source cue information as a basis for credibility judgments: The impact of task involvement. *Social Psychology*, *41*(2), 93-104.

Rohrer, D., Pashler, H., & Harris, C (2015). Do subtle reminders of money change people's political views? *Journal of Experimental Psychology: General*, *144*, e73-e85.

Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological Review*, *84*, 127–190.

Slepian, M. L., Bogart, K. R., & Ambady, N. (2014). Thin-slice judgments in the clinical context. *Annual Review of Clinical Psychology*, *10*, 131-153.

Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Sciences*, *23*, 645-726.

Street, C. N. H., & Masip, J. (2015). The source of the truth bias: Heuristic processing? *Scandinavian Journal of Psychology*, *56*, 254-263.

Street, C. N. H., & Richardson, D. C. (2015). The focal account: Indirect lie detection need not access unconscious, implicit knowledge. *Journal of Experimental Psychology: Applied*. Advance online publication. doi: 10.1037/xap0000058.

ten Brinke, L., Stimson, D., & Carney, D. R. (2014). Some evidence for unconscious lie detection. *Psychological Science*, *25*, 1098-1105.

Vadillo, M. A., Hardwicke, T. E., & Shanks, D. R. (2016). Selection bias, vote counting, and money priming effects: A comment on Rohrer, Pashler, and Harris (2015) and Vohs (2015). *Journal of Experimental Psychology: General*. Advance online publication. doi: 10.1037/xge0000157.

Vadillo, M. A., Kostopoulou, O., & Shanks, D. R. (2015). A critical review and meta-analysis of the unconscious thought effect in medical decision making. *Frontiers in Psychology*, *6*. doi: 10.3389/fpsyg.2015.00636.

RECOMMENDED READING

Bargh, J. A. (2014). (See References). A positive review of unconscious thought, contrasting with the critical stance adopted in the present article.

DePaulo, B. M., & Morris, W. L. (2004). (See References). A review of indirect lie detection which concludes that unconscious processing boosts lie detection accuracy.

Newell, B. R., & Shanks, D. R. (2014). Unconscious influences on decision making: A critical review. *Behavioral and Brain Sciences*, *37*, 1-19. A critical and accessible review of unconscious thought with commentaries from both sides of the argument.

Street, C. N. H., & Richardson, D. C. (2015). (See References). A reinterpretation of unconscious lie detection, showing how a conscious focusing of attention can better account for the findings.

ten Brinke, L., & Carney, D. R. (2014). Wanted: Direct comparisons of unconscious and conscious lie detection. *Psychological Science*, *25*, 1961-1963. The conclusion of a short debate around unconscious lie detection, arguing that more evidence is needed before we make conclusions about unconscious lie detection.