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Reading Lies: Nonverbal Communication and Deception

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Abstract

The relationship between nonverbal communication and deception continues to attract much interest, but there are many misconceptions about it. In this review, we present a scientific view on this relationship. We describe theories explaining why liars would behave differently from truth tellers, followed by research on how liars actually behave and individuals' ability to detect lies. We show that the nonverbal cues to deceit discovered to date are faint and unreliable and that people are mediocre lie catchers when they pay attention to behavior. We also discuss why individuals hold misbeliefs about the relationship between nonverbal behavior and deception—beliefs that appear very hard to debunk. We further discuss the ways in which researchers could improve the state of affairs by examining nonverbal behaviors in different ways and in different settings than they currently do.

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READING OTHERS

Life is so full of encounters with other humans that we tend to take these encounters for granted. Often, social interactions run fairly seamlessly, and we do not spend much time reflecting on their omnipresence or plumbing the depths of how they actually work. Scholars, however, have taken on the task of trying to understand social interaction in all its complexity. There is now a vast body of scientific literature on this topic spanning multiple disciplines, including psychology, sociology, anthropology, linguistics, and philosophy.

When we interact with others, we make judgments of the other person's state of mind—we try to read their emotions, thoughts, needs, and intentions. This makes sense because knowing what is going on in another person's head can be used both to coordinate cooperative interactions and to gain advantage in competitive ones.

A nondisputed claim in psychology is that mind reading (i.e., making inferences about another's state of mind) is central to social interactions. The psychological picture of humans painted by modern social and cognitive psychology is that of chronic mind readers who constantly engage in rapid and partly automatic evaluation of the mental states of other people. How good are we, then, at accurately reading minds? The major finding from research is that we are not as good at reading other people as we think. We are not operating in complete darkness, but we vastly and consistently overestimate our skills (Epley 2014). This is an arresting finding that cuts to the heart of our beliefs about ourselves as social agents.

READING DECEPTION AND TRUTH

If mind reading is inaccurate in everyday life, then it might lead to confusion, misunderstandings, and unnecessary conflict between individuals. Faulty mind reading can also have catastrophic consequences for individuals or for society as a whole. Deception is such an example where misjudgments can be costly. Nobody knows how many innocent people have suffered unjust punishment because others have judged them to be guilty, but we do know that this problem is substantial (Garrett 2011, Scheck et al. 2003). In addition, thousands of people have died in terrorist attacks that could have been prevented if the deceptions involved in executing the attacks had been detected. So, in contrast to casual social judgments, judgments of deception and truth can literally be a matter of life and death.

There is an extensive body of work on deception and its detection. In this article, we offer an overview and a critical discussion of this literature and focus on the role of nonverbal behavior in telling and reading lies. We do so because, unlike verbal or physiological lie detection, judgements of nonverbal behavior can be made in every social encounter. Nonverbal lie detection is also a domain where many myths continue to exist: People typically overestimate the relationship between deception and nonverbal behavior and the ability to detect deceit by observing nonverbal behavior.

Two *Annual Review of Psychology* articles about deception precede this article. Hyman's (1989) theoretical contribution made us aware of how much the publication of deception research has increased over the past three decades. Hyman covered the period between 1966 and 1986. Using SCOPUS search software with key words "lie detection" or "deception," we found 415 psychology articles for this period, an average of 20.75 per year. In the year 2016 alone, we found 206 psychology articles, almost ten times as many. More recently, Pennebaker et al. (2003) published an article that included deception, but it focused on word use rather than nonverbal behavior. In other words, this is the first *Annual Review of Psychology* article about nonverbal behavior and deception. We provide a comprehensive overview and rely on seminal publications in this field.

DETECTING DECEPTION THROUGH NONVERBAL BEHAVIOR

The notion that lies are transparent and can be detected through nonverbal behavior dates back a long time. As early as 900 BC, it was claimed that liars shiver and engage in fidgeting behaviors (Trovillo 1939a). In 1908, Münsterberg pointed to the utility of observing posture, eye movements, and knee jerks for lie detection purposes (Trovillo 1939b). Famously, Freud (1959, p. 94) wrote: "He who has eyes to see and ears to hear may convince himself that no mortal can keep a secret. If his lips are silent, he chatters with his finger-tips; betrayal oozes out of him at every pore."

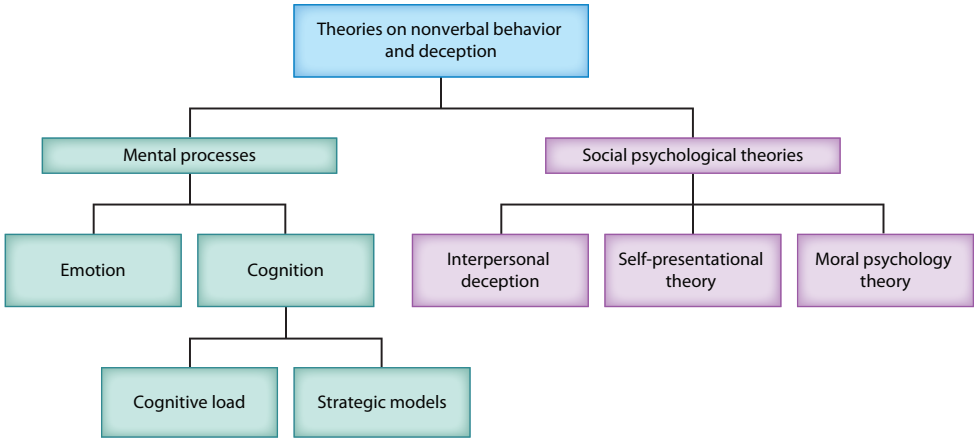

Figure 1

Theories of nonverbal behavior and deception.

Popular culture reflects the enduring belief that liars give themselves away through nonverbal behavior. For example, there are numerous books aimed at a popular audience recommending ways to decipher deception based on demeanor (e.g., Houston et al. 2012, Meyer 2010). Also, the basic mythology of the leaky liar is integrated into American police interrogation manuals (Vrij & Granhag 2007). The belief in the detectability of lies is also built into many legal presumptions—for example, jurors in criminal cases are often asked to pay attention to the defendant's nonverbal behavior to assess their truthfulness (Sporer & Schwandt 2006, Vrij & Turgeon 2018).

The relationship between nonverbal behavior and deception intrigues people and represents big business. In this article, we review what is currently known about this topic. We discuss theories about why liars and truth tellers would display different behaviors and then review research on actual nonverbal cues to deception. As we describe, research consistently shows that attempting to read truth and deception results in very poor accuracy rates, most likely because the behavioral traces of deception are faint.

WHY WOULD TRUTH TELLERS AND LIARS DISPLAY DIFFERENT BEHAVIORS? THEORIES OF NONVERBAL CUES TO DECEPTION

There are many theories explaining the relationship between nonverbal behavior and deception (**Figure 1**). We do not offer an overview of past distinctions between these theoretical views (for such an overview, see Bond et al. 2015). Instead, we restructure the theoretical discussion and offer a reclassification of deception theories. Our rationale for this restructuring is that the field of deception has grown significantly since many of the classic conceptualizations were launched (Zuckerman et al. 1981), and that both social and cognitive psychology, on which deception theory is ultimately based, have undergone major theoretical developments (Fiske & Taylor 2013).

Mental Process Theories: Emotion and Cognition

One cluster of theories about nonverbal behavior and deception deals with the mental processes that are involved in producing a deceptive statement. These mental process theories share the premise that the most fruitful approach to understanding the overt behavior of a liar is to inspect

the internal processes that occur when lies are told. A critical distinction within such theories is that some focus on emotional processes and others on cognitive processes.

Emotional theories. Ekman & Friesen (1969) presented the first modern theoretical conceptualization of nonverbal behavior and deception. Drawing on psychoanalytic models of the unconscious and early Darwinian theories of emotion, they hypothesized that a failure to completely suppress emotions associated with deception—anxiety, fear or even delight at the prospect of successful deceit—could result in nonverbal cues (the so-called leakage hypothesis). Such leakage cues could appear in various nonverbal channels, such as the face, arms or hands, and legs or feet.

Ekman's (1985) theory about deceptive leakage has been highly influential in the popular media, even spawning a major network show (*Lie to Me)* supposedly partly based on Ekman's life and work. However, Ekman's claims have been highly criticized in the scientific community (Bond et al. 2015, Lindquist et al. 2012). The problem with Ekman's emotional theory is that it lacks clear definitions of what emotions liars are supposed to feel and when. Moreover, why would a truth teller in the same situation not experience the same emotions? To put it differently, the theory confounds emotion and deception (Nat. Res. Counc. 2003). Partly in reaction to the problems of emotional theory, recent theories have focused on the cognitive processes underlying deception.

Cognitive theories. The notion that liars and truth tellers would differ in cognitive processes dates back to Zuckerman et al.'s (1981) seminal paper. Over the past decade, cognitive theories of deception have come to dominate the conceptual landscape. These theories generally reject the utility of focusing on liars' emotions. Instead, they seek to understand how and when lying is more cognitively taxing than telling the truth and how such cognitive load might manifest itself in nonverbal behavior.

Cognitive load theory. Vrij and colleagues (2008a, 2016, 2017a) have built a substantial body of work around the notion that, in interview settings, lying may be more cognitively demanding than telling the truth, which subsequently can be exploited for the purpose of lie detection. Vrij et al. (2008b) suggested a number of reasons why differences in cognitive load between liars and truth tellers may occur. For example, it may be that formulating a lie is more difficult than drawing a truthful account from memory. For a lie to be believable, it has to contain sufficient details to bear the characteristics of a self-experienced event. Offering details that sound plausible requires imagination, and liars may lack such imagination. In addition, offering details may be risky if the target of the lie has information that contradicts the liar's claims (Nahari et al. 2014).

Furthermore, truth tellers appear to take their credibility for granted in ways that liars do not. For example, truth tellers often express the belief that if they simply tell the truth the way it happened, their innocence will become apparent to their communication partner (Kassin 2005, Strömwall et al. 2006). If liars are more prone to believe that their credibility is in jeopardy, they ought to expend more effort to come across as believable. Finally, whereas activating the truth often happens automatically, activating a lie is more intentional and deliberate and thus requires mental effort (Gilbert 1991, Walczyk et al. 2003). Although these are good reasons to believe that lying places a stronger burden on cognitive resources than telling the truth, lying may not give rise to clear cues in itself—it seems that specific interview protocols are required for clear cues to emerge (Vrij et al. 2017a).

Strategic models. Strategic models make up another branch of cognitive theories of deception. These models view the psychology of deception as a kind of game that demands many strategic decisions from the liar. They draw partly on Hilgendorf & Irving's (1981) classic model of the

psychology of suspects' decision making: People who have incriminating information to conceal are faced with strategic choices about what information to admit to, what information to conceal, and what information to deny. Other researchers have elaborated on this notion, primarily in relation to strategic interviewing techniques (Granhag & Hartwig 2008). The most important point is the model's emphasis on liars' psychology as being driven by planning, strategizing, and calculation. Research has shown that insight into liars' interview strategies facilitates lie detection as long as investigators use specific interview techniques aimed to exploit these strategies [e.g., cognitive credibility assessment (Vrij et al. 2017a), strategic use of evidence (Granhag & Hartwig 2015), and the verifiability approach (Nahari 2018)].

Social Psychological Approaches: Interpersonal and Contextual Theories

The social psychological approaches to understanding nonverbal behavior in deception share the view that deceptive (and truthful) behavior occurs in a social context, in alignment with Lewin's (1943) notion that behavior is a function of the person and the environment. In this section, we focus on three theories that are based on this idea.

Interpersonal deception theory. Interpersonal deception theory (IDT) states that deception is a dynamic interaction between senders and receivers of messages (Buller & Burgoon 1996). This may sound trivial, but prior to IDT, research paradigms rarely reflected the interactive nature of deception. IDT further states that deception unfolds in time: Senders monitor the behavior of receivers and vice versa, and they mutually adjust their behavior in accordance with the feedback that they receive from each other. Plausible as this may seem, IDT has been criticized on the grounds that it is conceptually underdeveloped and that it fails to generate testable hypotheses (DePaulo et al. 1996).

Self-presentational theory. Drawing on Goffman's (1959) classic work on social behavior in ordinary life, DePaulo (1992) proposed a theory of the psychology of deception in which lying is not an extraordinary form of social behavior, qualitatively different from other forms of conduct. Following Goffman (1959), who pointed out that life is like a theater and that people often behave as actors on a stage, DePaulo suggested that most social behavior is not raw; instead, people edit, groom, and adjust how they come across to others to pursue a variety of social goals. Such editing may occur on both verbal and nonverbal levels.

In the self-presentational view of deception, liars and truth tellers share a common goal: to come across as truthful. To achieve this goal, both liars and truth tellers may engage in deliberate (and automatic) self-presentational efforts and in similar forms of behaviors to create a credible impression (Feldman et al. 2002, Weiss & Feldman 2006). This is a radical theory of deception because it emphasizes the similarities between lying and truth telling rather than the characteristics unique to deception. However, DePaulo (1992) also points out that there is a critical difference between the two activities: Both liars and truth tellers make claims of honesty, but in contrast to truth tellers, liars know that their claims are illegitimate. This so-called deception discrepancy may give rise to cues to deception, in that liars embrace their stories to a lesser extent and experience a more pronounced sense of deliberateness.

Moral psychology theory. As a theoretical framework for their seminal meta-analysis on accuracy in lie judgments, Bond & DePaulo (2006) introduced a new view of deception that emphasized the moral psychological elements of lying and judging lies. They proposed the double-standard hypothesis, which suggests that people have two sets of moral standards regarding the

acceptability of lies: When we imagine ourselves being the target of deception, lying is a moral offense. However, when we ourselves tell a lie, we trivialize the seriousness of our behavior and readily generate justifications. Recall Ekman's (1985) emotional theory that liars might experience guilt and shame. In Bond and DePaulo's view, this may be nothing more than a projection, in that we think that we ought to experience such emotions. When lying, we may be morally more pragmatic. We tell a lie for a reason, and we justify it to maintain our self-concept as decent human beings [see self-concept maintenance theory (Mazar et al. 2008) and moral hypocrisy theory (Monin & Merritt 2012)]. This theory offers a new and promising way to think about the psychology of deception, although deception scholars need to explore it in more detail.

NONVERBAL CUES TO DECEPTION: THE EVIDENCE

DePaulo et al. (2003) published the most comprehensive meta-analysis of cues to deception to date. It included 116 studies examining 158 cues, of which 102 could be considered nonverbal (vocal or visual). There were 50 cues that were examined in at least six studies, and since they give the most compelling results (DePaulo et al. 2003), we focus on these. Significant findings emerged for 14 of the 50 cues, and they are listed in **Table 1**. The cues are ranked in terms of their effect sizes. Cohen (1977) suggested that effect sizes of 0.20, 0.50, and 0.80 should be interpreted as small, medium, and large effects, respectively. **Table 1** shows that the effect sizes for these diagnostic cues are typically small. The largest effect size, $d = -0.55$, was found for verbal and

Table 1 Diagnostic (non)verbal cues to deceit based on at least six measurements

Cue	*d*-score	Type of cue
Verbal and vocal immediacy (impressions): degree to which responses sound direct, relevant, clear, and personal	−0.55	Verbal and vocal
Discrepancy or ambivalence: degree to which communication seems internally inconsistent or information from different sources (e.g., face versus voice) seems contradictory; degree to which speaker seems to be ambivalent	0.34	Mixture of verbal, vocal, and visual
Details: units of information	−0.30	Verbal
Verbal and vocal uncertainty (impressions): degree to which speaker seems uncertain, insecure, or not very dominant, assertive, or emphatic; degree to which speaker seems to have difficulty in answering the question	0.30	Verbal and vocal
Nervousness or tenseness (overall): degree to which speaker seems nervous or makes body movements that seem nervous	0.27	Visual
Vocal tension: degree to which voice sounds tense, not relaxed	0.26	Vocal
Logical structure: consistency and coherence of statements	−0.25	Verbal
Plausibility: degree to which the message seems likely or believable	−0.23	Verbal
Frequency or pitch: degree to which voice pitch sounds high or fundamental frequency of the voice	0.21	Vocal
Negative statements and complaints: degree to which the message sounds negative or includes complaints	0.21	Verbal
Verbal and vocal involvement: degree to which speaker describes personal experiences or describes events in a personal and revealing way; degree to which speaker seems vocally expressive	−0.21	Verbal and vocal
Fidgeting: object or self-fidgeting (undifferentiated)	0.16	Visual
Illustrators: gestures that accompany speech	−0.14	Visual
Facial pleasantness	−0.12	Visual

Negative *d*-scores indicate truth telling, and positive *d*-scores indicate lying. *d*-scores are taken from DePaulo et al. (2003).

vocal immediacy and the lowest, $d = -0.12$, for facial pleasantness. Ten of the 14 cues listed in **Table 1** have a nonverbal element, and the average effect size for these nine cues is $d = 0.26$. Given that 35 of the 50 cues were (at least in part) nonverbal cues and that a large majority of them (25 out of 35, or 71%) did not show any relationship with deception, we conclude that the relationship between nonverbal cues and deception is faint and unreliable (e.g., DePaulo & Morris 2004).

The results for the verbal cues are more promising than those for the nonverbal cues. Eight of the cues listed in **Table 1** contain a verbal element, and the average effect size for the eight cues is $d = 0.30$. Moreover, only a small majority of verbal cues (10 out of 18, or 55%) was unrelated to deception. In addition, an increasing body of research has shown that verbal cues to deceit can be elicited or enhanced when specific interview styles and protocols are introduced (Granhag & Hartwig 2015, Hartwig et al. 2014, Vrij et al. 2017a). Such research does not exist in the field of nonverbal cues to deception, so it remains doubtful that specific interview protocols can elicit or enhance these cues.

DePaulo et al.'s (2003) work has been very influential. In recent work, researchers have mainly focused on verbal cues to deceit, largely ignoring nonverbal behaviors. DePaulo et al.'s thorough examination of nonverbal cues and their conclusion that those cues are mostly unrelated or, at best, weakly related to deception has discouraged many researchers from examining nonverbal cues. This, at least, is what we have noticed: Lively debates about the merits of nonverbal lie detection no longer take place at the scientific conferences that we attend. Yet nonverbal lie detection remains highly popular among practitioners, such as police detectives, and in the media, as discussed in the next section.

PSEUDOSCIENTIFIC LIE DETECTION

The most popular lie detection tools used in legal contexts have in common that they claim that nonverbal behavior can offer guidance in the search for truth. In many ways, these practice-based techniques are similar, in that they share the naïve psychological view that a deceitful person is one under emotional pressure, leaking cues to their internal distress through channels that they are not aware of.

There are numerous books, manuals, and training seminars sold under the pretense that they will make the consumer better at distinguishing between lies and truths. We do not enumerate them all. However, it is worth discussing some of the most pervasive techniques and comparing their claims to empirical reality.

The Behavior Analysis Interview

The Behavior Analysis Interview (BAI) is part of the Reid school of interrogation, which has been widely criticized because of its link to miscarriages of justice (Garrett 2015). It consists of a list of 15 questions (e.g., "Did you commit the crime?") to which truth tellers and liars are supposed to give different (non)verbal responses. The Reid interrogation manual (Inbau et al. 2013) refers to a field study as support for the BAI (Horvath et al. 1994). The problem with this field study, also acknowledged by Horvath et al. (1994), was a lack of ground truth because the researchers actually did not know which of the 60 suspects were telling the truth and which were lying. In the only laboratory experiment to date that tested the BAI, the liars and truth tellers did not display the nonverbal responses predicted in the BAI (Vrij et al. 2006b).

Facial Microexpressions

Ekman (1985) has long argued that deceptive emotional information is leaked by microexpressions, fleeting but complete facial expressions that are thought to reveal the felt emotion during emotional

concealment. This idea has enjoyed popularity in the media (Henig 2006) and scientific community (Schubert 2006), despite a lack of research. Porter & ten Brinke (2008) conducted the first and, to date, only published experiment examining the relationship between microexpressions and deception. They found microexpressions in only 14 video fragments (2% of the video fragments included in the study), and six were displayed by truth tellers rather than by liars.

Neurolinguistic Programming

Neurolinguistic programming (NLP) is offered to practitioners as a tool to improve communication skills, including how to detect deception. In the NLP literature, it has been suggested that truth tellers and liars differ from each other in the specific eye movements that they display. Interestingly, the founders of NLP (Bandler & Grinder 1979) never suggested this, but the claim has appeared elsewhere. For example, Rhoads & Solomon (1987) claimed a link between eye movements and deception, referring to four independent studies without referencing them. Scientific studies found no support for the NLP-related eye movement hypothesis (Mann et al. 2012b, Wiseman et al. 2012).

The Baseline Approach

Investigators are sometimes trained to examine a suspect's natural, truthful, nonverbal behavior at the beginning of an interview through small talk (Frank et al. 2006, Inbau et al. 2013). This behavior is then used as a baseline comparison with the investigative part of the interview, whereby any difference in response between the baseline and investigative parts of the interview can be interpreted as a sign of deceit (Vrij 2016). The problem with this approach is obvious: There are fundamental differences between small talk and the investigative part of the interview that could influence someone's behavior, and this apple and orange comparison will be prone to incorrect judgments (Moston & Engelberg 1993). Although baseline deception research exists (Brandt et al. 1980a,b; Feeley et al. 1995), research comparing specific behaviors of truth tellers and liars during the baseline and investigative parts of an interview does not exist.

In conclusion, practitioners are offered a variety of lie detection techniques that amount to little more than pseudoscience. It is a lamentable state of affairs that professionals are taught all sorts of techniques with no evidence that they actually work. As discussed above, misjudging deception can have severe and costly consequences. Unfortunately, it is not illegal to bring bogus training packages onto the market. Professionals should ask for conclusive evidence that the proposed techniques actually work before signing up to any course in lie detection.

HOW DO THE CUES RELATE TO THE THEORETICAL PERSPECTIVES?

The extent to which the empirical landscape supports the theories that we outline is difficult to determine because some theories predict similar patterns, and some cues can be taken as support for several theories. This is perhaps a reflection of a problematic state of affairs in terms of theory, in that we have yet to arrive at a sufficiently coherent synthesis of principles to allow for unambiguous predictions and conclusions.

In some ways, it is easier to point to theories that have not received empirical support. From the pattern derived from meta-analyses, it is clear that the emotional theory is not well supported, with only two cues (nervousness and tenseness) being weakly related to deception. This is an important finding for the study of nonverbal behavior and deception because the emotional theory makes the most definitive predictions about the existence of nonverbal signs of deception.

When we inspect the patterns of strongest cues in **Table 1**, there are several things to note. First, the finding that cues to deception are generally weak supports both the self-presentational perspective and the double-standard hypothesis. Second, when we look at the cues to deception that do appear to be diagnostic, the findings that liars sound less immediate and come across as more ambivalent further supports the self-presentational perspective, in that it shows that lies appear to be less embraced. However, these findings can also be considered support for the strategic models, which argue that lying involves calculation. It may be that the evasiveness, uncertainty, ambivalence, and lack of details found in the meta-analytic patterns are not unintentional—as the self-presentational perspective might suggest—but may instead be the result of liars being more reluctant to commit to a firm statement because they are wary of the possibility of being disproven. Third, there is also support for the cognitive load perspective, in that, compared to truth tellers, liars appear to be less immediate, more ambivalent, and more uncertain, and their statements are less detailed and sound less plausible. However, it should be noted that the statements above apply to the strength of cues that arise without any provocation—recent research has shown that cues to cognitive load can become more pronounced through various interventions (Vrij et al. 2016, 2017a).

In summary, the empirical evidence provides some support for the self-presentational perspective and the cognitive load theory and is also consistent with a strategic and morality-based view. We believe that the scattered nature of the result patterns suggests that researchers might need to rethink the theoretical landscape to come to an overarching theory. As a starting point, it may be fruitful to design experiments that pit theories against each other to get a better understanding of why particular cues do or do not arise and under which circumstances.

REASONS WHY NOT MANY DIAGNOSTIC CUES TO DECEIT HAVE BEEN FOUND TO DATE

In the previous section, we discuss two important reasons why few cues to deceit have been found to date: Truth tellers and liars often have similar experiences (the self-presentational perspective), and liars often trivialize the seriousness of their behavior (the double-standard hypothesis). In this section, we discuss further reasons. Some of these possibilities make it more likely that more nonverbal cues to deception will emerge in future research, but other possibilities make it unlikely that many more nonverbal cues will ever be found. We start with the possibilities that give a reason for optimism (from some cues being overlooked to a cluster of cues possibly being more diagnostic).

Some Cues Are Overlooked

It is possible that several of the more diagnostic cues to deception have not yet been examined. We give three examples. First, different types of smiles exist, but most deception researchers do not distinguish between them. Smiling emerges as a cue to deceit when subcategories are taken into account. Ekman (1985) has identified several different smiles, as well as a distinction between felt and false smiles. Felt smiles include smiles in which the person actually experiences a positive emotion, whereas false smiles are deliberately contrived to convince another person that a positive emotion is felt when, in fact, it is not. Felt smiles are accompanied by the action of two muscles: the zygomatic major, which pulls the lip corners upward toward the cheekbone, and the orbicularis oculi, which raises the cheek and gathers skin inward from around the eye socket. The latter change produces bagged skin below the eyes and crow's feet creases beyond the eye corners. In false smiles, the action of the orbicularis oculi muscle causing the effects around the eye is often missing (Frank et al. 1993). Ekman and colleagues (1988) found that truth tellers displayed more

felt smiles than did liars, whereas liars displayed more false smiles than did truth tellers. When the distinction between felt and false smiles was not made, truth tellers smiled as frequently as liars (Ekman et al. 1988). Other differences include the facts that false smiles are more asymmetrical, appear too early or too late, and often last longer (Ekman et al. 1990).

Second, nonverbal communication researchers (Efron 1941, Ekman & Friesen 1972, McNeill 1992) have identified many subcategories of hand gestures, but deception researchers typically ignore these subcategories. Research has shown that cues to deceit may arise when subcategories are taken into account. When, in an experiment, hand gestures were taken as a whole, no difference emerged between truth tellers and liars, but differences were found in subcategories of hand gestures (Caso et al. 2006). Truth tellers made significantly more deictic gestures (pointing or using the hand to make reference to an object), whereas liars made significantly more metaphoric gestures (illustrations of an abstract concept, such as a closed fist to indicate strength), which are typically made when describing abstract ideas (McNeill 1992).

Third, gaze aversion (looking away from the conversation partner) is the stereotypical behavior that is most strongly associated with deception (Glob. Decept. Team 2006), but is actually not associated with deception (DePaulo et al. 2003). Research on gaze behavior typically examines visual saccadic eye movements, which change the direction of people's visual attention. However, saccadic eye movements also occur when people are not inspecting a visual scene, often without the person being aware of making such movements. These movements occur when people are engaged in tasks that require search through long-term memory. Truths, more than lies, are based on extensive and frequent interactions with the real world and are therefore more readily accessible from long-term memory (Ganis et al. 2003). It has been found that truth tellers displayed fewer nonvisual saccades than liars (Vrij et al. 2015).

Unprecise Measurements

Another explanation for the lack of diagnostic nonverbal cues to deception is that nonverbal behaviors are typically measured too roughly in research (often by frequency per minute of video footage) or are not linked with speech (Bull 2009, Ekman 1981). Although eye contact with a conversation partner does not discriminate truth tellers from liars when measured as an average per minute of the interview, it does when examined more subtly. It has been found that liars demonstrate slightly prolonged episodes of eye contact that appear somewhat unnaturally intense, as if they wanted to check out their conversation partner, a phenomenon labeled deliberate eye contact (Mann et al. 2012a; 2013a,b). There are two reasons why liars seek deliberate eye contact. First, they try to convince their conversation partner that they are telling the truth, and when people attempt to convince others, they tend to look them in the eyes (Kleinke 1986). Second, liars tend to monitor their conversation partner's reactions carefully to assess whether they appear to be getting away with their lie (Buller & Burgoon 1996).

Others have pointed out that nonverbal behavior should be examined in relation to speech content (Bull 2009, Ekman 1985). It is claimed that, in particular, mismatches between speech and behavior could be indicative of deceit (e.g., a head nod while answering "no"). Although such claims are typically illustrated with examples, there is no systematic research available supporting this claim.

Idiosyncratic Behavior

Nonverbal cues to deceit may occur on an individual level, that is, different individuals may give their lies away in different ways (DePaulo et al. 2003). Empirical studies present results at a group level rather than at an individual level, and therefore, such studies, as well as meta-analyses based

on such studies, cannot capture signs of deceit at an individual level because idiosyncratic cues do not become apparent. It is debatable how useful idiosyncratic cues are for practitioners who try to detect deceit. Idiosyncratic cues imply that each individual displays an almost unique set of cues to deceit, and these cues probably also vary with the type of lie told and the situation. An investigator would have no idea which cues to rely on in any individual case.

A Cluster of Cues May Be More Diagnostic

It is possible that, when researchers examine each nonverbal cue individually, no diagnostic cue to deception occurs, but that a diagnostic pattern will arise when a combination of cues is taken into account (DePaulo & Morris 2004). This could perhaps explain why concepts such as immediacy, ambivalence, and uncertainty all emerged as diagnostic cues to deceit (see **Table 1**). Making assessments of such states is likely to be based on a cluster of behaviors rather than on individual cues.

Situational Differences

It has been argued that cues to deceit are more likely to occur when the stakes are high than when they are low (Ekman 1985, Frank & Svetieva 2012, O'Sullivan et al. 2009). In high-stakes situations, when the consequences of being judged as deceptive are serious, liars may feel stronger emotions, may experience more cognitive demand, and may be more motivated to manage their behavior to appear credible. In their meta-analysis, Hartwig & Bond (2014) examined the detectability of lies based on nonverbal cues and compared settings that elicit strong emotions with settings of a more trivial nature. No difference was found in the detectability of lies between these two settings. The same meta-analysis did not find an effect for motivation, either. The reason for these null effects is that emotion and motivation will also affect truth tellers. For example, liars may be more likely to display nervous behaviors when the stakes are high, but so may truth tellers (Bond & Fahey 1987, Ofshe & Leo 1997), which means that the difference between them will not change.

It is more likely that the situation will overshadow differences in behavior between truth tellers and liars. For example, being accused of wrongdoing may result in different reactions. Some people may panic, whereas other people may, instead, put effort into trying to convince the accuser that they are innocent. Such differential reactions are likely to occur in both liars and truth tellers and could overshadow the typically subtle nonverbal differences between them. This may explain why, in one experiment (Vrij 1995), nonverbal cues to deceit emerged in an information-gathering type of interview (in which interviewees were asked to report in their own words their activities) but not in an accusatory type of interview (in which interviewees were accused of wrongdoing) (see also Vrij et al. 2017b).

Contagious Behaviors

People often automatically and unconsciously mimic the behavior of their interaction partners, as seeing someone behave in a particular way activates a behavioral representation, causing the perceiver to adopt the exhibited behavior (Chartrand & Bargh 1999). It is difficult to see how behavior can be indicative of deception if an individual's behavior is, at least in part, influenced by the behavior of the conversation partner. In fact, behavioral interpretations can easily go wrong. In one experiment, a (mock) police officer was fidgeting with his fingers when interviewing half of the innocent and guilty mock suspects (experimental condition), whereas he kept his fingers still in the other half of the interviews (control condition). Both innocent and guilty suspects moved their fingers more in the experimental condition. When observers saw the videotaped interviews,

they perceived the innocent and guilty suspects in the experimental condition as more deceptive than those in the control condition (Akehurst & Vrij 1999). In other words, the suspects in the experimental condition unconsciously mimicked the fidgety behavior of the officer, and their fidgety behavior made them appear suspicious.

The behavior of one person can also influence the behavior of another in settings other than a mimicry setting. Investigators are sometimes advised to get physically closer to suspects during an interrogation (Inbau et al. 2013). Such behavior may well elicit gaze aversion in suspects, as people typically start to avert their gaze when their personal space is invaded (Argyle & Dean 1965). Since investigators typically perceive gaze aversion as a sign of deceit, such a response could thus raise suspicion.

Strategies Employed by Truth Tellers and Liars

Liars employ strategies to appear convincing more frequently than do truth tellers, who tend to believe that the truth is transparent (illusion of transparency; see Gilovich et al. 1998). The nonverbal strategies that liars and truth tellers employ are likely to be the same: Both will try to suppress behaviors that they think appear suspicious—mostly signs of nervousness—and will try to replace them with behaviors that they think will look honest (Hocking & Leathers 1980). It is different for speech content, however. Truth tellers' strategy is to tell it all and to give as much detail as they can remember. In contrast, liars do not wish to give too much detail out of fear that investigators can check such details and will discover that they are lying (Hartwig et al. 2007, Nahari et al. 2012). In summary, to appear convincing, truth tellers and liars employ similar nonverbal strategies but different verbal strategies (Hartwig et al. 2010, Vrij et al. 2010). This may explain why speech content is more revealing about deception than is nonverbal behavior.

ACCURACY IN LIE DETECTION THROUGH OBSERVING NONVERBAL CUES

Bond & DePaulo (2006) published the most comprehensive meta-analysis to date about individuals' ability to detect deceit. They analyzed the results from 206 documents including data from almost 25,000 observers. These observers made veracity judgements based on watching videotapes, listening to audiotapes or reading transcripts from truth tellers and liars. On average, 54% of their judgments were correct, a performance just better than chance (50%). The medium to which observers were exposed mattered for the accuracy of their judgments. When they could only see the target person, they performed worse (52% accuracy) than when they could only hear the target person (63%), with an accuracy rate between those two scores (56%) when they could both see and hear the target person. This suggests that access to verbal content facilitates discrimination between truths and lies. A meta-analysis about the effect of lie detection training supported this conclusion: Training focusing on vocal and visual cues to deceit only resulted in small improvements, whereas training related to speech content resulted in medium-sized improvements (Hauch et al. 2016). Of course, observers may make less accurate judgments than they are capable of when observing behavior and may fail to spot some diagnostic cues. Hartwig & Bond (2014) addressed this issue by examining accuracy rates based on multiple nonverbal cues that were coded objectively. Although this is the ideal situation for nonverbal lie detection, and although the experiment included complex decision making models that only computers can use, the accuracy rate was still rather low at 67.68%.

Apart from lower accuracy, Bond & DePaulo's (2006) meta-analysis revealed a second negative consequence of paying attention only to visual cues: Messages judged from visual cues result in a lie bias—the tendency to judge someone as a liar. Access to only visual information should encourage

the use of nonverbal stereotypes because, when speech content is unavailable, observers have little other than their stereotypical beliefs to rely on (Bond & DePaulo 2006). Since nonverbal stereotypes relate to the behavior of liars rather than truth tellers (e.g., liars lack eye contact and fidget), a lie bias is the result. This could perhaps explain why US police investigators typically show a lie bias (Kassin et al. 2005, Meissner & Kassin 2002), whereas their UK counterparts do not (Mann et al. 2004, 2008). US officers are trained to pay attention to nonverbal behavior when attempting to detect deceit, whereas UK investigators are instructed to ignore nonverbal behavior (e.g., Vrij et al. 2017b).

Following the same reasoning, using nonverbal lie detection tools could result in a lie bias. People find it difficult to pay attention to speech and behavior simultaneously (Patterson 1995). Therefore, when investigators are taught to pay attention to behavior, they will be inclined to focus solely on behavior and to ignore speech content.

Bond & DePaulo (2006) also compared the performance of presumed deception experts (e.g., law enforcement personnel, psychiatrists, job interviewers) with laypersons (typically college students), but found no difference in accuracy between the two groups. A difference emerged between the groups in terms of confidence, with deception experts being more confident than laypersons (Kassin et al. 2005). The tendency to be confident is not unique to police officers or individuals engaged in lie detection, but rather is common among many groups of professionals in carrying out various tasks (Allwood & Granhag 1999).

Although the Bond & DePaulo (2006) article is more than 10 years old, it is still the most comprehensive text about observers' ability to detect lies. Since then, research has shown that, under some circumstances, people's ability to detect lies becomes substantially better, but no line of research has shown that such an improved accuracy rate can be obtained through observing behaviors. Instead, using specific interview protocols and analyzing speech content offers improvements (Hartwig et al. 2014, Vrij et al. 2017a), as does taking into account contextual factors, including familiarity with the topic and the context of the conversation (Levine 2015).

INDIVIDUALS' VIEWS ON THE RELATIONSHIP BETWEEN NONVERBAL BEHAVIOR AND DECEPTION

Table 2 presents an overview of a selection of nonverbal cues that are often claimed to be diagnostic cues to deceit on the Internet and in popular magazines, nonscientific books, or US police manuals (Vrij 2008). For each cue, **Table 2** presents (*a*) its actual relationship with deception according to DePaulo et al.'s (2003) meta-analysis and (*b*) how people believe it is related to deception, based on numerous surveys in the area (Vrij 2008).

Table 2 shows, first, that 13 of the 16 cues are not related to deception, and the three that are diagnostic show only small effect sizes. In contrast, people typically believe that most of these 16 cues are related to deception and that the direction of these relationships (e.g., liars display gaze aversion and make many movements) is in accordance with what can be read on the Internet or in popular magazines, nonscientific books, and police manuals about the topic. Deception experts and laypersons share the same stereotypical views about nonverbal cues to deceit (Vrij et al. 2006a).

WHY INDIVIDUALS CONTINUE TO MAKE NONVERBALLY BASED VERACITY ASSESSMENTS

There are numerous reasons why individuals continue to make nonverbally based veracity assessments despite the lack of evidence that they actually work. In this section, we present what we believe to be the main reasons.

Table 2 Overview of frequently mentioned nonverbal cues to deceit, their actual relationship with deception, and their assumed relationships with deception

Cues	Actual relationship	Assumed relationship
Vocal		
Hesitations (use of speech fillers, e.g., "ah," "um," "er," "uh," and "hmmm")	.04	Associated with lying
Speech errors (grammatical errors, word or sentence repetition, false starts, sentence change, sentence incompletions, slips of the tongue, etc.)	.00	Associated with lying
High-pitched voice	**.21**	Associated with lying
Speech rate (number of spoken words in a certain period of time)	.07	No assumed relationship
Latency period (period of silence between question and answer)	.02	No assumed relationship
Pauses (silent, filled, or mixed)	.02	Associated with lying
Visual		
Gaze aversion (looking away from the conversation partner)	.03	Associated with lying
Smiles (smiling and laughing)	.00	No assumed relationship
Facial fidgeting (face touching or rubbing hair)	.08	Associated with lying
Self-fidgeting (touching, rubbing, or scratching body or face)	−.01	Associated with lying
Fidgeting (undifferentiated)	**.16**	Associated with lying
Illustrators (hand and arm movements designed to modify or supplement what is being said verbally)	**−.14**	No assumed relationship
Leg and foot movements	−.09	Associated with lying
Posture shifts (movements made to change seating position)	.05	Associated with lying
Head movements (head nods and head shakes)	−.02	Associated with lying
Eye blinks (blinking of the eyes)	.07	Associated with lying

Data on actual relationships between cues and lying is taken from DePaulo et al. (2003). Data on assumed relationships is taken from Vrij (2008). Positive *d*-scores indicate increase in liars, and negative *d*-scores indicate decrease in liars; significant relationships are indicated in bold.

Little Choice Other than to Observe Behaviors

There are situations in which investigators have little choice other than to observe behaviors, for example, when attempting to spot wrongdoers in public spaces such as airports, public transport, and sporting events. Intriguingly, we are not aware of any published peer-reviewed research about what officers are supposed to look for in such situations. In general, we believe that the nonverbal deception research carried out to date does not fit well with situations in which such assessments are important (see **Table 3**, sidebar titled Possible Settings in which an Analysis of Nonverbal Behavior Could Take Place). The US Government Accountability Office (Gov. Account. Off. 2017) reviewed the evidence behind the US Transportation Security Administration (TSA) program of spotting possible wrongdoers at US airports. It concluded that the TSA has no evidence that most of the indicators that it uses to identify wrongdoers at airports are actually suitable for that purpose.

Police interview styles differ between the United States and Western European countries. In the United States, accusatory interview techniques are typically employed, whereas in Western Europe, information-gathering techniques are used (Meissner et al. 2014). Officers who use accusatory interview styles of interviewing are encouraged to pay attention to nonverbal behavior, whereas those who use information-gathering styles are encouraged to solely concentrate on the speech content (Vrij et al. 2017b). This difference could be the result of how much a suspect speaks. Suspects are encouraged to speak more in information-gathering interviews—and actually

Table 3 Possible settings for analysis of nonverbal behavior

Type of setting	Realistic setting?	Example	Nonverbal analysis required?	Research published?
No interview, and target does not speak	Yes	Target observed at an airport	Definitely	No
An interview setting, but target does not speak	Yes	Custodial interview, suspect is silent	Definitely	No
Target is interviewed outside the interview room	Yes	Target approached at an airport	Not necessarily	No
An interview setting, the target speaks, but there is no interaction between interviewer and the target	No	No examples found	Not necessarily	The vast majority of research
An interview setting, the target speaks, there is interaction between interviewer and the target, but there is no background evidence	Yes	Custom interview, asylum interview	Not necessarily	Little
An interview setting, the target speaks, there is interaction between the interviewer and the target, and background evidence exists	Yes	Typical police interview of suspect	No	Little

say more in such interviews—than in accusatory interviews (Meissner et al. 2014). The less suspects say (in accusatory interviews), the more inclined investigators will be to pay attention to nonverbal behaviors (Vrij et al. 2017b).

Lack of Self-Insight

People do not have proper insight into their own behavior when they lie. In an experiment, participants were given two interviews, one in which they told the truth and one in which they lied, and were subsequently asked how they thought they behaved in both interviews (Vrij et al.

POSSIBLE SETTINGS IN WHICH AN ANALYSIS OF NONVERBAL BEHAVIOR COULD TAKE PLACE

In **Table 3**, we list possible settings in which an analysis of nonverbal behavior could take place. We do not provide a complete list of all possible settings, but rather, a list of settings that are relevant for this review. Each setting is assessed in terms of whether it is realistic (its operational relevance), whether it requires an analysis of nonverbal behavior, and the extent to which the setting has been addressed in nonverbal communication and deception research.

This list allows us to draw several conclusions. First, an analysis of nonverbal behavior could, at least theoretically, take place in many different settings. Second, however, it also shows that there are only a few settings for which an analysis of nonverbal behavior is absolutely essential. Basically, a nonverbal analysis is required only when the target does not speak. Third, the few settings in which an analysis of nonverbal behavior is required have not been addressed in research. Fourth, the vast majority of deception research has addressed a setting in which the target speaks (for a brief period), but where there is no real interaction between the target and the interviewer. This is not a realistic setting. In fact, we could not produce one single example that illustrates this setting. The overall conclusion is clear: Researchers should refocus and should examine nonverbal communication in settings where a nonverbal analysis is required.

2001). They mistakenly believed that they showed stereotypical behaviors such as gaze aversion and excessive movements when they lied. When people lie, they are more aware of their behavior than when they tell the truth, and they are particularly aware of exhibiting any behaviors that they think look suspicious. Liars think that displaying gaze aversion and making movements looks suspicious, so they are aware of these behaviors each time they display them. What they do not realize is that they also display such behaviors when telling the truth.

The Power of Stereotypes

Social psychology research has shown that, once stereotypical views have been formed (e.g., the notion that liars display gaze aversion and excessive movements), various cognitive processes are activated, with the result that these stereotypical views are more likely to endure. For example, once incorrect views have been formed, people will perceive supporting evidence that in fact does not exist, so-called illusory correlations (Stroessner & Plaks 2001). For instance, when observers were informed that someone was lying, they overestimated the amount of gaze aversion the alleged liar actually displayed (Levine et al. 2006).

People also tend to seek information that confirms rather than disconfirms their beliefs (so-called confirmation bias; Darley & Gross 1983). Any support that they find for their beliefs will boost their confidence that their views are correct, making it less likely that they will alter them. Of course, people will always find supporting evidence; for example, sometimes liars do look away or make excessive movements.

Moreover, when people come across an example that disconfirms their beliefs, they are more likely to disregard it than to interpret this new evidence as a sign that their initial belief is incorrect, a phenomenon called belief perseverance (Anderson et al. 1980).

Once people have formed an opinion that makes sense to them, they will come up with further reasons to support their view (the power of thinking; Tesser 1978). If people are asked why they think liars look away, they may think of reasons to corroborate this view and search their memory for examples where they encountered liars who averted their gaze (Strömwall et al. 2004). Thinking about examples that support their beliefs will strengthen their opinion.

Finally, people often do not receive adequate feedback to learn from their own experience and to discover that their views are inaccurate. For feedback to be effective, it needs to be given frequently, reliably, and immediately. In terms of feedback about nonverbal cues to deception, observers should be informed immediately after every interaction with another person whether that person was lying. Of course, this is not a realistic scenario. If people discover that they have been lied to, it is often a long time after the interaction took place (Park et al. 2002), by which time they have probably forgotten how the person behaved.

Culturally Transmitted Misbeliefs

It is likely that most misbeliefs about nonverbal behavior and deception are culturally transmitted (Sperber 2009). For example, there are numerous popular writings about the relationship between nonverbal behavior and deception. Most of them reiterate common stereotypes and boldly state that nonverbal lie detection works. Therefore, most people will have been exposed to incorrect information about the topic (Hurley et al. 2014), believing it to be true.

FUTURE DIRECTIONS IN NONVERBAL DECEPTION RESEARCH

One aim of this review is to reveal gaps in nonverbal deception research, of which we have identified three. First, more work is needed on the theoretical side, including carrying out experiments that

pit existing theories against each other, so that their strengths and weaknesses can be revealed. Such experiments should also aim to search for an overarching theory that explains the complicated findings in this domain better than the existing theories. Second, we present several reasons why not many diagnostic cues to deceit have been found to date. Several of these possible reasons imply the optimistic view that more diagnostic cues can be found, and these positive reasons are worth exploring further. Third, researchers should focus on examining nonverbal behaviors in settings where there is no alternative to making nonverbal veracity assessments. Although this advice sounds obvious, it has not yet been followed.

CONCLUDING REMARKS

If we take a bird's-eye view of the nonverbal communication and lie detection research, we see, first of all, a broken theoretical landscape. Many theories do exist, but none of them appears to fully capture the relationship between nonverbal behavior and deception. Among the inhabitants of this landscape, we find liars who tell their stories in various settings, including in settings where nonverbal communication is crucial. Those liars are (surprisingly) ignored, and the research focus is on liars who act in settings where nonverbal communication is less important. We also find lie catchers who are not as good at reading other people as they may think. In fact, their skills are mediocre, and they hold robust misbeliefs about nonverbal cues to deceit. They also appear active in telling each other that their method of lie detection works without providing the crucial evidence to support these claims.

SUMMARY POINTS

1. Various theories about nonverbal communication and deception exist, but they do not fully explain why liars behave the way that they do.
2. Nonverbal cues to deception are faint and unreliable, but verbal cues to deceit are more diagnostic.
3. A more optimistic picture of the potential to find reliable nonverbal cues to deception may emerge if researchers examine the cues differently and do so in more relevant settings
4. People's ability to detect lies is mediocre, particularly if they have access only to visual cues.
5. People overestimate the relationship between nonverbal behavior and deception and assume many relationships that are actually untrue (stereotypes).
6. These stereotypical views are hard to debunk.

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