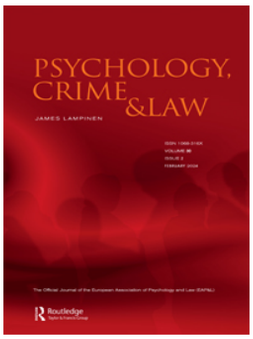

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What have we learned about cues to deception? A survey of expert opinions

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ABSTRACT

Researchers have accumulated a substantial body of empirical work studying observable behaviors that might distinguish truth tellers from liars – that is, cues to deception. We report a survey of $N = 50$ deception cue experts – active researchers on deception – who provided their opinions on three issues: (1) What cues distinguish between truthful and deceptive statements? (2) What moderators influence the magnitude and direction of cues to deception? (3) What explanatory mechanisms of deception cues are best supported by research? The experts displayed agreement on few issues. Expert opinion on cues to deception, potential moderators, and explanatory mechanisms is mixed and often conflicting. The single issue on which more than 80% of experts agreed was that gaze aversion is not generally diagnostic of deception. This lack of consensus suggests that substantial work remains to be done before broad agreement can be established. It follows that any practical recommendation advocating the use of a specific deception cue cannot be widely representative of expert opinion.

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Cues to deception; experts; consensus; lying

For more than a century, scientists have studied cues to deception – observable behaviors hypothesized to differ depending on whether a person is lying or telling the truth (for a review see DePaulo et al., 2003). With such a long history of empirical research, one might expect the field to have reached some consensus on core issues: Which cues are reliable indicators of deceit? Which moderators influence the strength of deception cues? And which theoretical explanations best account for these findings? Here, by surveying deception researchers, we examine the extent to which any such consensus exists on these issues (for a similar approach, see, e.g. Kassin et al., 2018).

Assessing consensus in the scientific community has both scientific and practical value. Although consensus is not necessarily an indicator of the validity of scientific conclusions, consensus can be a useful indicator of current paradigms and dominant theoretical

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perspectives (Lakatos, 1978). As a practical matter, scientific consensus can provide a reference point for evaluating policy that aims to be based on that science (e.g. security screening methods based on deception cue research). Given that there is no shortage of 'popular science' discussions of cues to deception (e.g. Lieberman, 2022), scientific consensus can also serve as a reference point against which to evaluate such claims. Additionally, consensus among experts is a factor that bears on the admissibility of expert testimony in some places, such as the United States (see, e.g. *Daubert v. Merrell-Dow Pharmaceuticals*; *Frye v. United States*).

What do people believe about cues to deception?

Although no previous survey of deception researchers exists, several studies have examined various populations' beliefs about deception. This research shows that most laypeople believe that the behavior of liars and truth tellers differs in several ways. People consistently report a core set of behaviors as the most common or strongest cues to deceit. These beliefs are essentially a set of stereotypes that liars will avert their gaze more than truth tellers (Akehurst et al., 1996; Bogaard et al., 2016; Global Deception Research Team, 2006; Vrij et al., 2006); that liars will display more nervous behaviors than truth tellers (Akehurst et al., 1996; Bogaard et al., 2016; Colwell et al., 2006; Hartwig et al., 2015); that liars will shift their posture or touch themselves more than truth tellers (Global Deception Research Team, 2006; Hartwig et al., 2015); and that liars' statements will be less logical, plausible, or consistent than truth tellers (Colwell et al., 2006; Hartwig et al., 2015; Strömwall & Granhag, 2003; Vrij et al., 2006). We see such cues reported by laypeople (Global Deception Research Team, 2006), police officers (Bogaard et al., 2016; Colwell et al., 2006), social workers and teachers (Vrij et al., 2006), as well as financial investors (Hartwig et al., 2015). Although these beliefs seem generally consistent, some groups of people break from the overall pattern. Prisoners, for example, appear to differ considerably in their beliefs about deception cues compared to other groups (Granhag et al., 2004; Vrij & Semin, 1996).

Empirical research on cues to deception

Despite the consistency in reported beliefs about deception cues, these beliefs do not necessarily indicate what cues are truly associated with deception. Only empirical studies comparing the behavior of truth tellers and liars can inform us on this. To date, over 150 unique cues to deceit have been examined in the deception literature (DePaulo et al., 2003). This includes specific behaviors, such as foot and leg movements (deTurck & Miller, 1985); more holistic person judgements, such as pleasantness and friendliness (Burgoon et al., 1996); verbal cues, such a statement detail (Köhnken et al., 1995) and consistency (Granhag & Strömwall, 1999); para-verbal cues, such as pitch (Motley, 1974) and speech rate (Riggio & Friedman, 1983); as well as linguistic cues, such as pronoun use (Newman et al., 2003) and language positivity (Jupe et al., 2018). Indeed, virtually any observable behavior can be examined as a potential cue to deception.

Research on cues to deception has been examined meta-analytically both from broad theoretical perspectives (e.g. DePaulo et al., 2003; Sporer & Schwandt, 2006, 2007) and in narrower applied perspectives (e.g. Amado et al. 2015, 2016). DePaulo and her colleagues

(2003) have provided by far the most influential and widely-cited meta-analytic review (3353 citations on Google Scholar as of 14 February 2023). This meta-analytic review and others have generally found support for the notion that at least a few cues to deception indeed distinguish between truthful and deceptive statements, though the estimated effect sizes are generally small by conventional benchmarks (in DePaulo et al., 2003, the median effect was $d = |.10|$).

However, some researchers have recently identified potential problems and anomalies that raise questions about the reliability of the conclusions in the deception cue literature. For example, Bond et al. (2015) noted a 'decline effect' such that the longer a given cue has been researched, the smaller its meta-analytic effect size tends to be. Levine (2018) has argued that individual studies in the cue literature appear to sometimes contradict the broader meta-analytic findings. Furthermore, Luke (2019) has raised broad concerns that the precision of the effect estimates in deception cue research is so low that the available meta-analytic conclusions may be untrustworthy. In short, although researchers have produced a substantial body of empirical research on cues to deception, some are hesitant to draw broad conclusions about reliable indicators.

The present survey

For the present survey, we focus on eight cues or groupings of cues (see Table 1 for the list and a brief description of each cue). Our list of eight cues was inspired by previous work on beliefs about deception cues (Global Deception Research Team, 2006; Strömwall & Granhag, 2003; Vrij & Semin, 1996), as well as meta-analytic reviews on the topic (DePaulo et al., 2003; Sporer & Schwandt, 2006, 2007). This list is far from exhaustive, but it comprises commonly researched cues to deception. These cues are among the most frequently reported in DePaulo et al's (2003) meta-analytic review of cues to deception. For each of the cues included in the survey, there exist one or more deception theories that predict that deception increases or decreases the magnitude or frequency of the cue.

In addition to beliefs about deception cues, we were also interested in beliefs about moderators. Many deception researchers acknowledge the importance of moderators, emphasizing that cues to deceit can be more or less diagnostic depending on the situation (O'Sullivan et al., 2009; Porter & ten Brinke, 2010; Vrij et al., 2008). As a concrete example, Wright Whelan et al. (2014) argue that gaze aversion is more diagnostic

Table 1. List of cues included in the survey.

Cue	Description
Between-statement consistency	Between-statement consistency refers to the degree of overlap between statements across repeated interviews
Nervous behavior	Nervous behavior refers to behavior suggestive of a general increase in anxiety. It includes behaviors such as sweating, fidgeting, and increased pitch.
Gaze aversion	Gaze aversion is the same as not looking someone in the eye
Statement detail	Statement detail refers to the amount of information or comprehensiveness of a statement
Physical movements	Physical movements refer to any movements by a sender. It includes foot movements, hand movements, and postural shifts. Its opposite is stillness or rigidity.
Response latency	Response latency refers to the time it takes for senders to begin providing an answer to a question.
Verbal fluency	Verbal fluency refers to how smoothly and easily senders can express themselves.
Makes sense	A statement makes sense when it has a coherent structure, is easy to follow, and is free from contradictions

under high stakes situations. The argument being that this cue is a sign of an emotional response, such as shame or guilt, which liars, more so than truth tellers, will be more prone to feeling in high-stakes situations. Based on previous meta-analytic reviews on deception cues that have examined moderating effects (DePaulo et al., 2003; Sporer & Schwandt, 2006, 2007), we identified four potential moderators to be included in the survey: (1) the sender's degree of cognitive load; (2) the sender's motivation to be believed; (3) the stakes of the situation; and (4) the amount of preparation engaged in by the sender. To the best of our knowledge, no previous study has examined beliefs about moderators of deception cues.

Empirical research can tell us which cues distinguish truth tellers from liars, and how the context can moderate these cues. Theories of deception and their underlying assumptions concerning explanatory mechanisms tell us why this is the case. By answering this crucial 'why' question, theories and their associated explanatory mechanisms provide us with the understanding required to generalize findings beyond a given sample, study, or context. Proposed explanatory mechanisms of deception cues are not in short supply. Problematically, many of these explanatory mechanisms lead to conflicting predictions about specific cues and moderators (DePaulo et al., 2003; Sporer & Schwandt, 2006). In light of this, we were also keen to investigate whether any consensus exists between researchers regarding the degree of scientific support for the most dominant explanatory mechanisms. By reviewing the literature, we identified eight influential mechanisms (see Table 2). It should be noted that there is considerable overlap between some of these. Hence, they should not be seen as mutually exclusive.

Methods

Inclusion criteria and recruitment of experts

We had two criteria for eligibility for participation. First, participants needed to have a doctoral degree in psychology, sociology, criminal justice, or another empirical social science. Second, participants needed to have published empirical research on cues to deception within the last 15 years. These criteria are highly similar to those previously used in surveys of experts in other domains of psychological science (e.g. Kassin et al., 2018).

To identify experts we searched the databases JSTOR, PsycINFO, and Web of Science, for articles on cues to deception published after 2004, using the search terms 'deception cues'

Table 2. Explanatory mechanisms of deception cues included in the survey.

Mechanism	Description
Arousal	Lying is more physiologically arousing than truth telling, which can result in reliable cues to deceit
Attempted Control	Liars attempt to control their behavior to a greater extent than truth tellers, which can result in reliable cues to deceit
Cognitive	Lying is more cognitively demanding than truth telling, which can result in reliable cues to deceit
Emotional	Liars experience different emotions compared to truth tellers, which can result in reliable cues to deceit
Leakage	Liars, in comparison to truth tellers, exhibit greater discrepancies between their verbal statements and their non-verbal behavior, which can result in reliable cues to deceit
Microexpressions	Microexpressions are momentary facial movements that express a true underlying emotion, which can result in reliable cues to deceit
Self-presentation	Both liars and truth tellers regulate the impressions they make on others, making cues to deceit faint

OR 'Statement Validity Analysis' OR 'Criteria Based Content Analysis'. This search was carried out in October 2019. This formal search was supplemented by searching through the references of major meta-analyses and reviews on deception detection, as well as by our own personal contacts within deception research. In total, we identified 122 experts who fit the inclusion criteria. We sent invitations to participate to each of the identified experts, as well as two reminders encouraging them to participate. After excluding the data of one participant who withdrew, our final sample consisted of $N = 50$ experts who completed the survey (a response rate of 38.5%). A description of the experts is provided below.

The survey

The survey was in English. It began with an informed consent form, which explained the purpose of the study and that all participation would be voluntary and confidential. The informed consent also explained that participants who completed the survey would be invited to a workshop where the results would be presented. The survey consisted of three sections: the first enquired about cues to deceit and moderators of these cues; the second enquired about explanatory mechanisms; and the third enquired about the respondents' demographics and expertise in deception research. Each of these sections is outlined in detail below.

We piloted two previous versions of the survey, revising the survey between pilots based on the feedback we received. The pilot surveys were sent to active researchers in deception as well as researchers with a background in psychology, but not specifically deception. We asked the respondents to provide feedback on how understandable they found the survey, whether they thought we had missed any key issues, such as specific cues or moderators, and whether there were any issues we could omit.

Section 1: cues and moderators

Participants were informed that in Section 1 they would be presented with eight possible deception cues used to differentiate between truth tellers and liars. They were instructed to 'select a general claim about each cue, as well as how the cue is affected by four potential moderators'. Cues were presented one at a time in random order. See Table 1 for all cue names and definitions The cue name and definition were presented as in Table 1. Participants then selected whether liars display the behavior more, about the same, or less than truth tellers do, or selected a 'don't know' option. After making this general claim, participants were presented with the four moderators: the sender's degree of cognitive load; the sender's motivation to be believed; the stakes of the situation; and the amount of preparation engaged in by the sender. Independently for truth tellers and liars, they then selected whether the moderator decreased, did not change, or increased the behavior, or selected the 'don't know' option. See Figure 1 for an example with the cue *nervous behavior*. Section 1 ended with an open question where participants could ' … describe any other cues or moderators you believe to be important for the task of deception detection'.

Section 2: explanatory mechanisms

In Section 2, participants were provided with a list of eight different explanatory mechanisms of deception cues. The mechanisms, and their definition, were presented as in Table 2. Participants rated the degree of scientific support for each mechanism on a five-point

Example question on cues and moderators

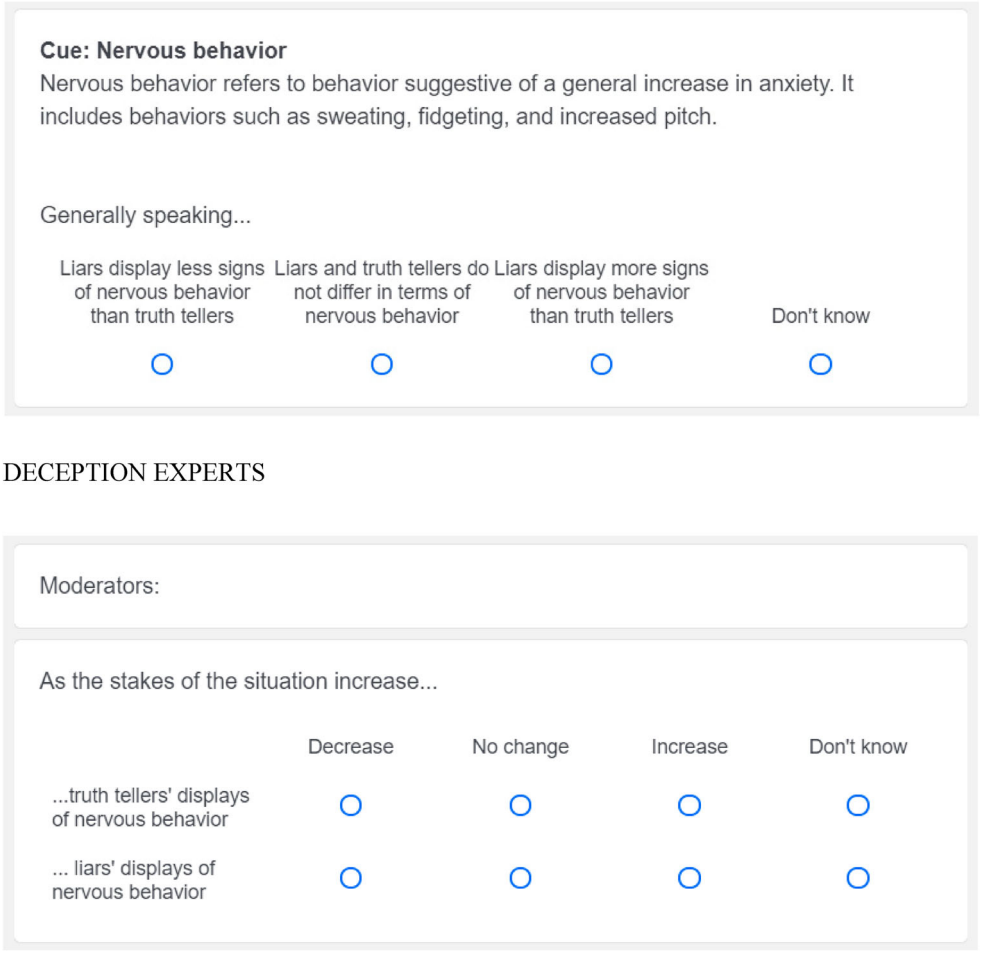

Figure 1. Example question on cues and moderators.

scale (1 = *little to no scientific support*; 2 = *some scientific support*; 3 = *moderate scientific support*; 4 = *strong scientific support*; and 5 = *robust scientific support*). The mechanisms were presented in random order.

Section 3: demographics and expertise

Section 3 began by enquiring about the participants experience as an expert witness. They were asked how often they had been asked to produce a report or to testify in court on deception related issues. These ratings were made on a 4-point scale (1 = *never*; 2 = *on a few occasions*; 3 = *frequently (5–10 times per year)*; 4 = *on a regular basis, greater than 10 times per year*). Following this, participants provided their age, gender, and country of residence. They were then asked to list the approximate number of publications they have produced on the topic of deception and to state the highest academic degree they have achieved, and what subject it was awarded in. The survey ended with a question asking how up-to-date on deception detection research the participants

considered themselves to be. This was rated on a 7-point scale, ranging from 1 (*Not at all up-to-date*) to 7 (*Very up-to-date*).

Analysis strategy

For general beliefs about cues and for the ratings of explanatory mechanisms, we simply report the percentages of each selected option. For the four potential moderators, the analyses were more complex. To reiterate, for each moderator respondents were asked whether the moderator decreases (given a value of 1), does not change (given a value of 2), or increases the presence of the cue (given a value of 3). This was asked separately for both truth tellers and liars. To estimate whether the moderator in fact moderated the cue we subtracted the rating for liars from the rating for truth tellers, and coded these into three possible outcomes: a positive value; a negative value; or zero. A positive value indicates that differences between truth tellers and liars on the cue will become larger due to the moderator, with increased prevalence for truth tellers relative to liars. A negative value also indicates that differences for the cue will become larger between truth tellers and liars due to the moderator, but with increased prevalence for liars relative to truth tellers. A zero indicates that the moderator does not moderate the cue.

Using the example provided in Figure 1, say a participant selected that both truth tellers and liars will display more nervous behavior as the stakes increase. This would lead to a value of zero ($3 - 3 = 0$), indicating no moderating effect of stakes. If a participant selected that truth tellers don't change and that liars become more nervous, this would lead to a value of -1 ($2 - 3 = -1$). This indicates that stakes do moderate nervousness. Specifically, that as the stakes increase liars will become more nervous relative to truth tellers. This would also be the case if a respondent selected 'less nervous' for truth tellers, and 'no change' for liars ($1–2 = -1$). Finally, if a respondent selected that liars do not change and that truth tellers become more nervous, this would lead to a value of 1 ($3 - 2 = 1$). This indicates that stakes do moderate the cue. Specifically, that as the stakes increase truth tellers will become more nervous relative to liars.

Results

The experts

Of the 50 experts in the sample, 3 completed the survey but did not provide demographic data. The 47 experts in the sample who provided demographic data were 44.6% (21) women, 53.2% (25) men, and 2.1% (1) of another gender. The average age of the experts was $M = 46.49$ years ($SD = 14.11$, $Mdn = 41$, range 27–80). The experts reported residing in seven nations: the United States (38.64%; 17), the United Kingdom (29.55%; 13), the Netherlands (13.6%; 6), Germany (6.8%; 3), Israel (6.8%; 3), Spain (2.3%; 1), and Sweden (2.3%; 1). Most (70.2%; 33) had never been retained as an expert witness, and 17.0% (8) had been retained a few times, 6.4% (3) were retained frequently (5–10 times per year), and 6.4% (3) were retained on a regular basis (10 or more times per year). On average, the experts rated themselves as very up-to-date on the relevant literature ($M = 5.00$, $SD = 1.53$, $Mdn = 5$). All the experts had PhDs, except for one respondent who had a JD.[1] The experts reported publishing an average of 17.28 ($SD = 18.27$, $mdn = 10$) reports on the topic of deception.[2]

Cues

Using the benchmark suggested by prior research surveying experts on legally relevant psychological research (e.g. Kassin et al., 2001; Kassin et al., 2018), we set an agreement rate of at least 80% as the threshold for a consensus. This benchmark is admittedly arbitrary, but we believe there is a relatively compelling case for consensus if 4 out of 5 experts agree on a given issue.

Figure 2 presents participants' reported beliefs about the eight cues to deceit. Bars represent the percentage of selections of each option for each cue. Frequency counts of participants' responses on the cue items and other items are presented in the Appendix. Based on our 80% cutoff, a consensus was reached on only one cue: gaze aversion. Specifically, over 80% of participants reported that liars and truth tellers do not differ in terms of gaze aversion. Two further cues – nervous behavior and detail – reached around 70% agreement. For nervousness, the majority of respondents reported liars and truth tellers do not differ on this cue. For detail, the majority of respondents reported that liars' statements are less detailed than truth tellers' statements. For the five remaining cues, agreement levels were around or below 50%. Hence, only one of the eight cues – detail – received a substantial majority as a valid cue to deceit, though still shy of our 80% cutoff for a consensus. For each cue, at least some of the participants selected 'don't know', but only one participant consistently selected this option for all cues.

One might argue that the lack of consensus on five of the cues is an artefact caused by our low response rate (viz. 50 of 122 experts filled in the survey). However, additional

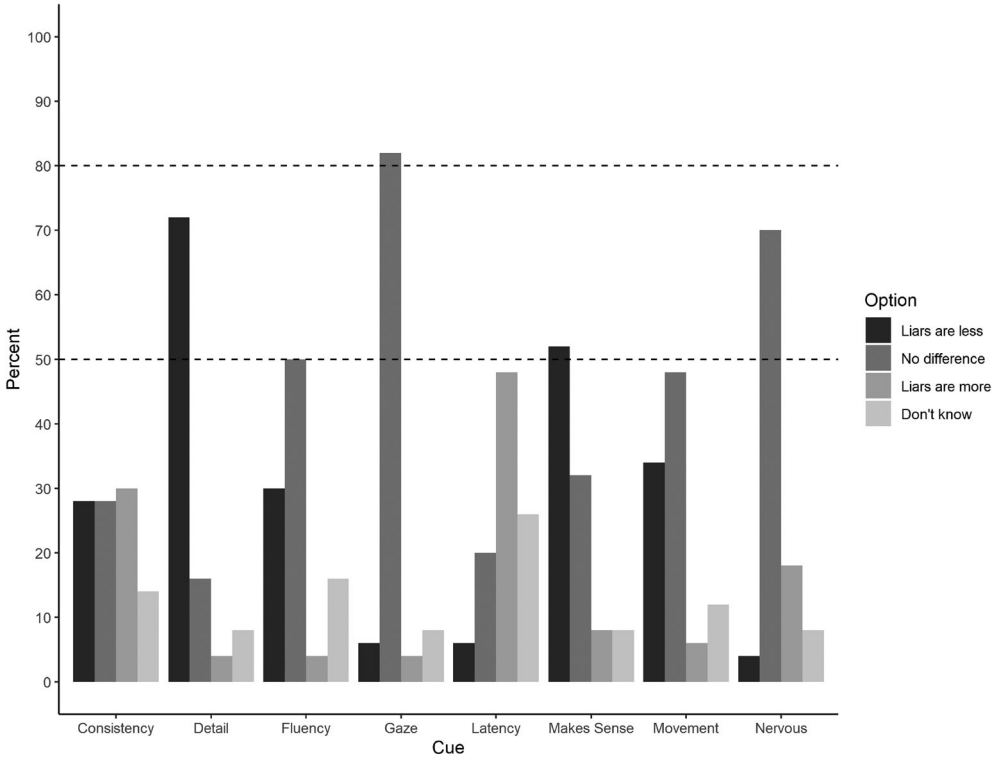

Figure 2. Expert beliefs about deception cues.

Table 3. Additional cues mentioned by respondents not included in the survey

n	Cue
3	Verifiable details
2	Complications
2	Unusual details
1	Admission of memory loss
1	Equivocal, evasive, and tentative language
1	Facial pleasantness
1	Pronoun use
1	Spontaneous corrections
1	Statement-evidence consistency
1	Voice pitch

Note: *N* refers to the number of respondents that mentioned this cue in an open-ended question. Respondents could mention more than one cue.

analysis shows agreement rates would still be under 80% for the cues body movement, consistency, fluency, and response latency, even if all of the 72 non-respondents had chosen the most popular option. For the cue makes sense, if all of the 72 non-respondents chose the most popular option, it would be exactly 80% agreement. We believe such level of agreement in the non-respondents is implausible. Hence, the high level of disagreement we report is unlikely a consequence of low the response rate.

For the open question on other relevant deception cues, participants listed a total of 10 additional cues. Although we cannot rule out the possibility that a consensus would have been reached on these cues, only three of these cues were listed by more than one person, and only one cue – *verifiable details*[3] – was listed by more than two ($n = 3$) (Table 3).

Moderators

Figure 3 presents participants' reported beliefs about how the four moderators influence each cue to deceit. Based on our 80% cutoff, there was no consensus on any of the moderators. There were a total of 32 cue-moderator combinations, and for 17 of these, the modal response represented at least 50% of the experts. The majority agreement in all these cases was that the potential moderator does not have an effect. Hence, there appears to be some agreement on which moderators do not influence the strength of a deception cue, but this agreement does not represent broad consensus. Surprisingly, there is little agreement on which, if any, moderators do have an effect on deception cues.

For the open question on other relevant moderators, participants listed a total of 13 additional moderators. Again, although we cannot strictly rule out the possibility that a consensus would have been reached on some of these moderators, only four of these moderators were listed by more than one person, and no moderator was listed by more than two (for the complete list see Table 4).

Explanatory mechanisms

Figure 4 presents participants' ratings of the different explanatory mechanisms of deception cues. The cognitive explanation was rated as the most scientifically robust. Only 4.2% of participants ($n = 2$) stated that the cognitive explanation had little to no scientific support. Microexpressions were rated as the least scientifically robust, with 74.5% of

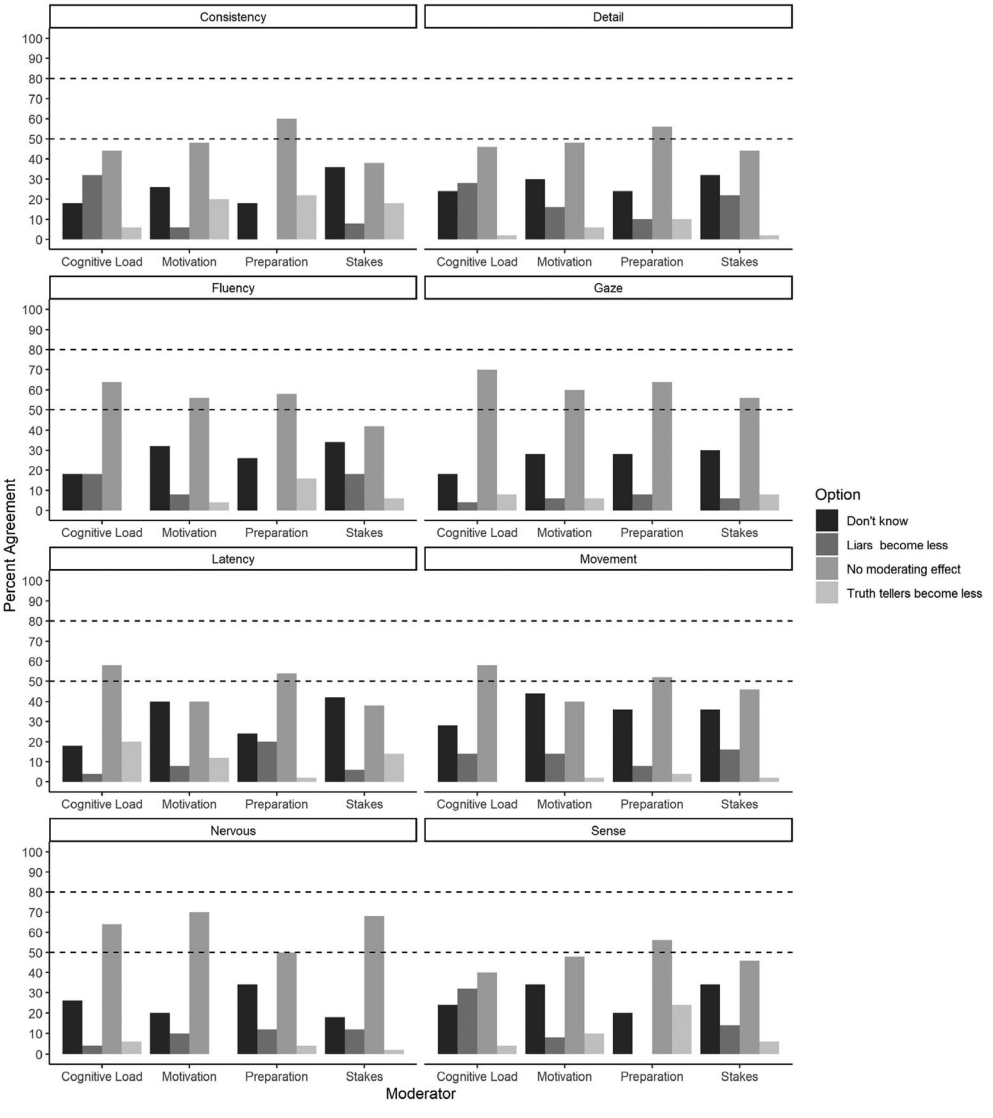

Figure 3. Beliefs about moderators of deception cues.

participants ($n = 35$) asserting that this explanation has little to no scientific support. Results were more mixed for the other explanations. Generally, participants rated explanations typically associated with emotion-based theories (i.e. microexpressions, emotional, leakage, and arousal) as less scientifically robust than the explanations associated with more socio-cognitive theories (attempted control, self-presentational, and cognitive).

One might wonder the extent to which opinions concerning the explanatory mechanisms of deception cues are idiosyncratic. For exploratory purposes, to assess this, we fit a unconditional linear mixed model predicting opinions about each explanatory mechanism using random intercepts for each respondent and each explanatory mechanism. The variance of respondents' intercepts estimates the extent to which experts vary in

Table 4. Additional moderators mentioned by respondents not included in the survey.

n	Moderators
2	Age
2	Culture
2	Language proficiency
2	Sender personality (e.g. extraversion, assertiveness, self-esteem)
1	Central vs. peripheral details
1	Experimental paradigm
1	Gender
1	Modality (e.g. face to face or mediated)
1	Motivation to be accurate
1	Question expectedness
1	Question type
1	Self-handicapping strategies
1	Type of preparation

Note: *n* refers to the number of respondents that mentioned this cue in an open-ended question. Respondents could mention more than one cue.

their propensity to believe there is support for explanations generally (i.e. some experts may perceive more support for explanations overall and others less). Such a model indicates that a substantial amount of variance in responses is explained by both the perspective itself, $ICC = .34$, and by the respondent, $ICC = .18$. There is considerable residual variance (.52), likely largely reflecting further idiosyncratic perceptions of each of the explanatory mechanisms. There is some agreement about the viability of the explanatory mechanisms, but opinions seem to be based on primarily individual differences, rather than properties of the explanations themselves. However, this model makes some problematic assumptions (e.g. that the response variable is continuous). For that reason, we should interpret these estimates with caution. Nonetheless, this model strongly suggests that appraisals of explanatory mechanisms of deception cues are highly idiosyncratic.

Discussion

Our aim was to examine experts' beliefs about deception cues, potential moderators of deception cues, as well as the explanatory mechanisms commonly proposed for deception cues. However, no clear consensus by experts emerged regarding what behaviors differ between truth tellers and liars. Out of the eight cues examined, only details – specifically,

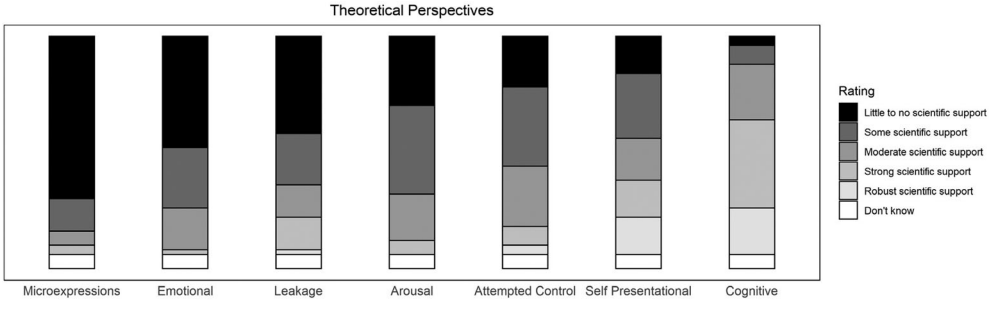

Figure 4. Beliefs about explanatory mechanisms of deception cues. Note: Height of the colors on each bar represents the proportions of each response.

that truth tellers would provide more detailed statements than liars – approached anything near our 80% threshold for consensus. With that said, experts largely agreed that gaze aversion and nervous behavior does not differ between truth tellers and liars. For moderators there was even less consensus than for general cues. Experts showed no meaningful agreement regarding what contextual factors may strengthen or weaken deception cues. Again, however, some agreement was evident regarding what contextual factors do not moderate cues to deceit. For explanatory mechanisms, experts rated cognitive and socio-cognitive explanations as more scientifically robust than emotion or arousal-based ones.

In many ways, these results stand in stark contrast to the beliefs about deception cues typically reported by laypeople, as well as members of specific professions, such as police officers and social workers (Akehurst et al., 1996; Bogaard et al., 2016; Colwell et al., 2006; Global Deception Research Team, 2006; Vrij et al., 2006). Whereas these groups regularly report gaze aversion and nervous behaviors as key cues to deceit, a majority of our experts agreed that these cues do not differ between truth tellers and liars. This discrepancy between experts' views and those of the general public is corroborated by our experts' relatively poor regard of arousal and leakage-based explanations of deception cues, which affirm gaze aversion and nervous behavior as valid deception cues.

In other ways, our findings align better with previous research on beliefs about deception cues. For instance, a majority of our experts reported that truth tellers provide more detailed statements than liars and provide statements that make more sense than liars (though this latter view was endorsed by only just over 50%). Such beliefs have also been observed with laypeople and members of specific professions, such as police officers and social workers (Colwell et al., 2006; Hartwig et al., 2015; Strömwall & Granhag, 2003; Vrij et al., 2006). Thus, regarding statement detail, experts and the lay public agree to some extent.

Nonetheless, the overall trend is a lack of clear consensus on most issues. Considering the long history of empirical research on deception, one wonders how researchers examining the same thing can hold such disparate views on central questions. We see at least two potential explanations for the apparent disagreement between experts. The first concerns limitations in our study, such as limitations in the survey or our sampling strategy. The second is that the lack of agreement may simply reflect the current state of deception research. We discuss each in turn.

Survey limitations inevitably arise when trying to capture the nuances of a complex behavior with broad claims and multiple-choice options. Indeed, in separate comments to us, one respondent explicitly reported that the questions could not capture their beliefs on deception cues, as they could not fully address all relevant contextual influences. Our choice to sometimes use broad headings (e.g. nervousness) to group more specific cues (e.g. sweating, fidgeting, and increased pitch) may also have affected our results. For instance, if respondents believed some, but not all, of these specific cues were indicative of deceit, the multiple-choice option they were given would be insufficient. Our inclusion of an open-ended response option ameliorates this issue to some degree as respondents could report valid deception cues they believed were lacking in the survey. In fact, pitch was one such cue. Furthermore, we are not sure whether more nuanced questions would necessarily lead to more consensus. One could imagine, for example, that providing more options would only lead to further discrepancies in answers. Indeed, if the deception cue literature is in a state such that it is unclear

what questions could be asked to capture agreement among experts, that fact in itself would suggest a lack of consensus.

A related explanation for our findings is that the term 'deception cue' itself is so ill-defined in the literature that it makes any consensus between experts unlikely. Recently, Levine (2022) argued that the deception literature typically conflates at least three distinct concepts under the term cue: observable behaviors, global impressions, and communication content. Levine suggests that the term 'cue' should exclusively be used for specific observable behaviors (e.g. gaze aversion). For global impressions based on clusters or constellations of cues (e.g. nervousness), Levine suggests the term 'demeanors'. Finally, 'communication content' is the basis of judgements that go beyond simple tallying and require an understanding and assessment of the context (e.g. plausibility). The extent to which such conceptual issues can account for our current findings is debatable. With that said, greater conceptual rigor should make research findings on deception cues more precise and interpretable, which may help bring clarity and consensus to the field.[4]

We plausibly could have found consensus on issues concerning blatantly pseudoscientific claims, had we asked about them. Recently, Denault and colleagues (2020) published an essay warning against the dangers of using unscientific nonverbal cues to deception in applied contexts. Given the substantial number of coauthors on that piece, experts could likely unite to reject claims about deception cues that clearly have no basis in research and theory – such as synergology, an approach to deception detection that builds on the claim that an analysis of body gestures can accurately uncover unconscious mental processes (Denault et al., 2020). Debunking pseudoscience is an important role of researchers, particularly if the unwarranted claims still inform policy and training. However, for the objectives of the present survey, we opted to ask experts primarily about cues and moderators that are potentially theoretically and empirically viable, rather than propositions that would have been easy to reject.

Limitations can also be raised about our sampling procedure and identification of experts. For instance, our search terms or choice of databases means we may have missed experts that fit our inclusion criteria. Alternatively, one could criticize our inclusion criteria itself. For instance, people well-versed in the deception literature, but not actively researching deception, were not included in our sample. Considering the extent of the lack of consensus we observed on many of the cues and moderators, whether the inclusion of these alternative or additional groups would have substantively altered our results is debatable.

Rather than being an artifact of methods or conceptual issues, the lack of consensus may reflect the current state of deception research. As noted above, Luke (2019) has argued that the informational value of the extant research on cues to deceit is so low that we cannot know whether there are any valid cues to deceit at all. Any cues that do exist must be weak, because we have sufficient data to exclude large effects. As Luke (2019) writes, 'if strong cues existed, we likely would have found them by now' (p. 660). Any true effects of cues, however, may have been estimated with such imprecision in existing research that the evidence may not be sufficiently convincing to persuade deception researchers widely. If this is the case, the current state of the knowledge invites disagreements between researchers, who may have widely varying and idiosyncratic views. Luke's (2019) claims may also explain the rather high number of 'don't know' responses given in the current study. That is, if the informational value of past research

on deception cues is weak, when asked about the diagnosticity of a deception cue, 'don't know' is a reasonable and justifiable response. In retrospect, it may have been useful to have two different 'don't know' options: one reflecting the respondent's belief that they are uninformed on the topic, the other reflecting a belief that the current state of knowledge is inconclusive regarding the validity of deception cues.

Moreover, some of the expert opinions we observed here are difficult to reconcile with the meta-analytic literature on deception cues. For example, the expert consensus that nervousness is nondiagnostic is inconsistent with DePaulo et al. (2003), who estimated a small but significant effect such that liars tend to be more nervous and tense than truth-tellers, $d = 0.27$, 95% CI [0.16, 0.38]. For comparison, the one cue which experts in our sample most endorsed as diagnostic of deception – statement detail – was estimated by DePaulo et al. (2003) to a have an effect size with a similar absolute value and similar precision, $d = -0.30$, 95% CI [−0.38, −0.21]. Given these results, why do just over 70% of experts believe that a lack of detail is a cue to deception, while nearly 70% also reject nervousness as a cue? If deception researchers are inconsistent with the most widely cited meta-analytic review of deception cues, it is unclear on what basis deception researchers have formed their opinions. Perhaps they are persuaded by more recent work focusing on verbal cues to deception such as statement detail (see, e.g. Amado et al., 2016). However, despite a majority of experts agreeing that nervousness is not a valid cue to deception, to the best of our knowledge, there has been no body of work dispositively demonstrating that nervousness has an effect size near zero. To be clear, we are not making any arguments about the evidence for or against any particular cues. Rather, we are calling attention to the ambiguity of the empirical basis of deception researchers' opinions.

Considering the lack of agreement on the diagnosticity of deception cues, it is perhaps unsurprising that little consensus was reached regarding what contextual factors moderate the strength of these cues. Indeed, experts provided a substantial proportion of 'don't know' responses to the items about moderators. This pattern of results suggests that experts might not have felt that there exists sufficient data to arrive at firm conclusions about many of the moderators. Arguably, the most contested moderator in the deception literature is the stakes of the situation (e.g. Frank & Ekman, 1997; Hartwig & Bond, 2014; O'Sullivan, 2008). Those who claim that stakes matter argue that some deception cues – such as indicators of nervousness – should only be diagnostic under high-stakes situations, when liars are expected to be more nervous than truth tellers (e.g. Frank & Ekman, 1997; O'Sullivan, 2008). Our data suggest that this view is not widely advocated by experts. If anything, the trend was of experts reporting that the stakes of the situation, as well as the other three moderators, do not influence the strength of deception cues.

Theoretical and practical implications

The diversity of researchers' beliefs about the support for explanatory mechanisms of deception cues is evident from their responses in the present survey. Consider the cognitive explanation. This perspective fared the best of any of the explanations included in the survey, with 55% of experts opining that it had strong or robust scientific support. However, 45% of experts indicated they believed research provided only moderate support or less for this explanatory mechanism, or that they simply did not know. Reasonable people may disagree about the implications of this level of support, but clearly we

are far from broad consensus, even concerning the explanatory mechanisms researchers believe has the most support. If we examine the other end of the spectrum, approximately three-quarters of experts in the present survey rejected microexpressions as unsupported. Researchers in other subfields similarly find microexpressions as an explanation of deception cues as unfounded (Kassin et al., 2018). However, microexpression research, as well as training programs based on this explanation, continues (e.g. Matsumoto & Hwang, 2018; Paul Ekman Group®, 2021). No explanatory mechanism has found sufficient support that practically everyone endorses it, and none have been sufficiently falsified that they have been completely abandoned.

Recently, Luke and colleagues (in press) have argued that the leakage hypothesis (see, e.g. Porter et al., 2012) has endured, despite what they view as conceptual and empirical shortcomings, at least partly because the idea is so ambiguously specified that serious attempts at falsification or boundary testing are not possible. The problem may be more general. Indeed, Levine (2018) has argued that 'cumulative scientific data prove critical elements of every major cue theory false' (p. 2476) and that belief in cue theories may derive from selective readings of individual studies (see also Luke, 2019). This argument echoes Watkins's (1984) critical comments on information processing and memory theories: '[T]his freedom [of interpretation] has given all researchers the luxury of having their very own theory – complete, incidentally, with sufficient implicit features to render it immune from the perils of empirical research' (p. 86). Regardless of whether one agrees with these criticisms, deception researchers clearly hold a wide variety of contentious, potentially conflicting theoretical perspectives.

All that said, diversity in theoretical perspectives is not necessarily a signal of poor scientific health. The history of science is replete with periods of theoretical instability in various fields (see, e.g. Kuhn, 1962; Planck, 1950). Such disagreement may simply be part of the process of discovery and criticism. However, deception cue research is not merely an academic exercise. Rather, it informs practical applications and policy (e.g. European Commission, 2018). Such applications will inevitably reflect the limitations of the research that informs them. Infamously, the United States Transportation Security Administration's (TSA) 'behavior detection' program – intended to detect deception and malintent at airport security checkpoints – was based heavily on microexpressions and leakage (Denault et al., 2020; Government Accountability Office, 2017, 2013), two explanatory mechanisms that fared quite poorly in the present survey in terms of expert support. The TSA's policies represent a particularly egregious example, but the problem may be much wider. Given the state of expert (non)agreement, any security policy based on cues to deception will inevitably struggle to reflect the generally accepted knowledge of the scientific community. There is simply too little generally accepted knowledge.

Conclusion

After a century of research, researchers appear to agree on relatively little concerning cues to deception. The present data suggest a lack of consensus both at the level of phenomena (e.g. statistical findings related to specific cues) and at the level of theory (e.g. explanations for why those cues occur). The only exception being a broad agreement that gaze-aversion is not a diagnostic of deceit. From a practical perspective, the general lack of consensus on key issues should be humbling for researchers who attempt to

translate science to practice. Because deception researchers appear to disagree on many issues, any recommendations given to policy-makers or practitioners, even ones ostensibly based on research, may not represent the opinions of the field at large. From a purely scientific perspective, the lack of consensus may not be inherently troubling. Disagreement among scientists means we have much more work to do, and given the extent of the disagreement, the work is unlikely to be boring.

We would like to thank the many attendees of the virtual symposium at which the results of this study were presented. For comments on earlier drafts, we are grateful to Will Crozier.

Notes

1. Although having a PhD was one of our inclusion criteria, we nonetheless chose to include this participant. We reasoned that a JD shows a similar level of academic achievement as a PhD. Furthermore, the participant in question reported having published on the topic of deception detection and being up to date on current research.
2. In response to the question about publications, some respondents provided non-numeric answers or ranges (e.g., "some", "100+", "70-80"). Erring on the conservative side, we removed these values when calculating descriptive statistics. Most such responses indicated values much greater than the mean and median we report here.
3. Verifiable details refer to details in a statement that can, in principle, be verified by a third party. For example, details concerning one's movements in a department store where it is known that there are CCTV cameras. This can be contrasted with unverifiable details. For example, describing the thoughts or feelings one had while in the department store. Researchers have suggested that, compared to liars, truth tellers will provide more verifiable details in their statements (e.g., Nahari et al., 2014, for a recent meta-analysis see Verschuere et al., 2021).
4. We thank Timothy Levine for bringing this issue to our attention.

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Appendix

Table A1. Frequency counts of expert opinions about cues to deception.

Cue	Liars are less	No difference	Liars are more	Don't Know
Consistency	14	14	15	7
Detail	36	8	2	4
Fluency	15	25	2	8
Gaze	3	41	2	4
Latency	3	10	24	13
Makes Sense	26	16	4	4
Movement	17	24	3	6
Nervous	2	35	9	4

Table A2. Frequency counts of expert opinions about deception cue moderators.

Cues	Moderator	Truth tellers become less	No moderating effect	Liars become less	Don't know
Consistency	Cognitive Load	3	22	16	9
Consistency	Motivation	10	24	3	13
Consistency	Preparation	11	30	0	9
Consistency	Stakes	9	19	4	18
Detail	Cognitive Load	1	23	14	12
Detail	Motivation	3	24	8	15
Detail	Preparation	5	28	5	12
Detail	Stakes	1	22	11	16
Fluency	Cognitive Load	0	32	9	9
Fluency	Motivation	2	28	4	16
Fluency	Preparation	8	29	0	13
Fluency	Stakes	3	21	9	17
Gaze	Cognitive Load	4	35	2	9
Gaze	Motivation	3	30	3	14
Gaze	Preparation	0	32	4	14
Gaze	Stakes	4	28	3	15
Latency	Cognitive Load	10	29	2	9
Latency	Motivation	6	20	4	20
Latency	Preparation	1	27	10	12
Latency	Stakes	7	19	3	21
Movement	Cognitive Load	0	29	7	14
Movement	Motivation	1	20	7	22
Movement	Preparation	2	26	4	18

(*Continued*)

Table A2. Continued.

Cues	Moderator	Truth tellers become less	No moderating effect	Liars become less	Don't know
Movement	Stakes	1	23	8	18
Nervous	Cognitive Load	3	32	2	13
Nervous	Motivation	0	35	5	10
Nervous	Preparation	2	25	6	17
Nervous	Stakes	1	34	6	9
Sense	Cognitive Load	2	20	16	12
Sense	Motivation	5	24	4	17
Sense	Preparation	12	28	0	10
Sense	Stakes	3	23	7	17

Table A3. Frequency counts of expert opinions about deception cue theories.

	Little to no scientific support	Some scientific support	Moderate scientific support	Strong scientific support	Robust scientific support	Don't know
Microexpressions	35	7	3	2	0	3
Emotional	24	13	9	1	0	3
Leakage	21	11	7	7	1	3
Arousal	15	19	10	3	0	3
Attempted Control	11	17	13	4	2	3
Self-Presentational	8	14	9	8	8	3
Cognitive	2	4	12	19	10	3