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Verbal cues in omission lies: The effect of informing sources about the essential part of the event

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Abstract

People sometimes lie by omitting information. The information lie tellers then report could be entirely truthful. We examined whether the truthful information that lie tellers report in omission lies contains verbal cues indicating that the person is lying. We made a distinction between (i) essential information (events surrounding the omission) and non-essential information (the rest); and (ii) made a distinction between informing or not informing participants about the key event they witnessed. Participants followed a target person. Truth tellers reported all activities truthfully; lie tellers omitted the key event. Participants were or were not informed what this key event was. In the analyses we discarded the information truth tellers reported about the key event lie tellers omitted. Truth tellers reported more external and contextual details, more complications and fewer common knowledge details and self-handicapping strategies than lie tellers, but only when discussing essential information. Being informed had no effect.

KEYWORDS

complications, keeping stories simple, omission lies

1 | INTRODUCTION

People lie in different ways. A popular method is to embed a lie in an otherwise truthful story (embedded lie, Leins et al., 2013). Another way to lie is by deliberately leaving out information. Such omission lies can sometimes be detected using the Strategic Use of Evidence (SUE) interview protocol (Granhag & Hartwig, 2015; Hartwig et al., 2014). The SUE technique is limited, however, in that it can be used only when investigators possess independent evidence.

Without evidence, detecting omission lies by analysing speech content is challenging, because the information lie tellers provide when telling an omission lie could be entirely truthful. The question then arises whether the truthful information lie tellers provide reveals that they are lying. Research addressing this question is rare. Perhaps the first researchers to examine this were Van Swol et al. (2012). They examined linguistic cues (e.g., pronouns, negative emotion words)

rather than types of verbal detail, the cues examined in the present experiment. They compared two types of lie (lying by purposefully including false information and omission lies) with truth telling. Unfortunately, their experiment only included seven participants who reported false information making interpretation of the results problematic. We are aware of only three published experiments examining types of detail, all carried out by Leal and colleagues (Leal et al., 2020; Leal, Vrij, Deeb, Burkhardt, et al., 2023; Leal, Vrij, Deeb, & Fisher, 2023). The results of these three experiments are promising. In all three experiments truth tellers exhibited some measurable verbal behaviours that distinguished them from lie tellers. For example, truth tellers provided more complications than lie tellers, a result also found in embedded lies research (Vrij et al., 2021).

In none of the Leal et al. experiments were truth tellers and lie tellers told which part of the event the investigator was particularly interested in. We expected this to have an effect. In the present

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omission lies experiment, we told half of the truth tellers and lie tellers what this part was. When truth tellers know what the key part of an event is, they may try to report that part in as much detail as possible, perhaps at the expense of reporting the less essential part. In contrast, it may make lie tellers more motivated to omit that part and, to appear cooperative, they may report more details about the other parts of the event.

2 | VERBAL CUES TO OMISSION LIES

We examined six verbal cues that have all been found to discriminate between truth tellers and lie tellers in deception research: Complications, details (external, contextual and internal), common knowledge details and self-handicapping strategies. Truth tellers and lie tellers use different strategies in interviews. Whereas truth tellers are willing to be forthcoming and 'to tell it all', lie tellers prefer to keep their stories simple (Hartwig et al., 2007). In Leal, Vrij, Deeb, and Fisher's (2023) omission lies experiment, lie tellers reported in a post-interview questionnaire to have used this keeping-stories-simple strategy more than truth tellers. Leal, Vrij, Deeb, and Fisher's (2023) also found that this keeping-stories-simple strategy was negatively correlated with reporting complications: Occurrences that makes a situation more complex ('I was confused where to sit'). Stories can typically be understood without reporting complications (Vrij, Leal, & Fisher, 2018). Suppose someone describes a reunion with friends in a café. Complications that occurred when visiting the café (e.g., not being able to find the entrance at first; being confused where to sit; being disappointed that a particular wine was no longer on the menu) are not necessary to understand what the friends' reunion entailed. If lie tellers are motivated to keep their stories simple, they may be inclined to leave out such complications. Research has shown that truth tellers report more complications than lie tellers when lie tellers tell embedded lies (Vrij et al., 2021) and omission lies (Leal et al., 2020; Leal, Vrij, Deeb, Burkhardt, et al., 2023; Leal, Vrij, Deeb, & Fisher, 2023).

Someone would expect the keeping-it-simple strategy also to result in lie tellers' reporting fewer details than truth tellers. Lie tellers reporting fewer details than truth tellers is a common finding in deception research examining embedded lies (Amado et al., 2016; Gancedo et al., 2021). In omission lies experiments, lie tellers reported fewer details than truth tellers in Leal, Vrij, Deeb, and Fisher's (2023), but Leal et al. (2020) found no Veracity effect for details whereas Leal, Vrij, Deeb, Burkhardt, et al. (2023) found that lie tellers reported more details than truth tellers. The absence of the typical Veracity effect in two of the three omission experiments published to date is unexplained.

A clearer picture about the relationship between details and deception may emerge if subcategories of details are defined. Only Leal, Vrij, Deeb, and Fisher (2023) did that. The other two experiments just measured total details. Following Bogaard et al. (2019), Colwell et al. (2007), and Leal, Vrij, Deeb, and Fisher (2023) split the total details variable into three categories: External details (perceptual

details), contextual details (temporal and spatial details) and internal details (feelings). Veracity differences only emerged for external and contextual details. In embedded lies scenarios truth tellers report all three types of detail more than lie tellers (Gancedo et al., 2021). We made the same distinction in the present experiment.

The above-described verbal cues (complications, external, contextual and internal details) are cues to truthfulness: Truth tellers report such cues more than lie tellers. We also examined two cues to deceit: Common knowledge details and self-handicapping strategies. These two cues have not yet been examined in omission lie research but could also be related to the keeping-it-simple strategy. Common knowledge details refer to strongly invoked stereotypical knowledge about the event (Vrij et al., 2021) ('He strolled through the shopping centre, having a brief look in some of the shop windows'). The aim to keep stories simple could be achieved by describing experiences in a stereotypical way. Apart from keeping it simple, there may be more reasons why lie tellers report common knowledge details. Stereotypical representations of events are probably always available to lie tellers, which would it make easier for them to stay consistent when they are asked to report their experiences multiple times. Lie tellers are very keen on keeping their stories consistent (Deeb et al., 2017; Granhag & Strömwall, 2002; Vredeveldt et al., 2014). Lie tellers may also believe that providing stereotypical information makes their stories more believable as the information is consistent with people's beliefs. People are more likely to believe information consistent with their beliefs.

Self-handicapping strategies are justifications as to why someone is not able to provide information (Vrij et al., 2021). ('The shopping centre was very busy so I could not see much of what the target person was doing'.) Providing justifications for not reporting many details is another way to keep stories simple. In embedded lies research, lie tellers typically report more common knowledge details and more self-handicapping strategies than truth tellers (Vrij et al., 2021).

When examining complications, common knowledge details and self-handicapping strategies, Vrij, Leal, Jupe, and Harvey (2018) introduced a new metric: Proportion of truthfulness cues. They defined 'proportion of truthfulness cues' as the number of complications/ (number of complications + number of common knowledge details + number of self-handicapping strategies). Given that truth tellers typically report more complications but fewer common knowledge details and fewer self-handicapping strategies than lie tellers, it is expected that the proportion of complications will be higher for truth tellers than for lie tellers. This effect was indeed found in embedded lies research (Vrij et al., 2021).

3 | BEING INFORMED ABOUT THE KEY PART OF AN EVENT

In the previous omission lies experiments, Leal and colleagues did not inform interviewees what the most important part of the event was for the investigator. If lie tellers are informed what the key part of an event is, they may be inclined to employ the keeping-it-simple

strategy particularly when reporting that part of the event. Since individual parts of an event are interlinked with each other, lie tellers may also employ the keeping-it-simple strategy related to the parts directly surrounding the key part. When telling an omission lie, lie tellers will omit the key part of the event but still may employ the keeping-it-simple strategy in the parts directly surrounding the omission. To appear cooperative, lie tellers may be inclined to compensate the lack of information they provide about the surrounding parts of the omission by providing more information about the remaining (more non-essential) parts of the event. In contrast, if truth tellers are aware which part of the event the investigator is particularly interested in, they may report more fully that key part of the event. That, in turn, may result in a more detailed recall of its surrounding parts. If truth tellers are aware that the investigator is less interested in other parts of the event, they may decide to become less informative about these non-essential parts of the event.

Truth tellers who are not informed about the key parts of an event are uninformed truth tellers. This concept differs from the incidental encoding truth tellers concept examined by Harvey et al. (2017, 2020). With incidental encoding, truth tellers witness an event that—at the moment of witnessing—is meaningless to them. They do not see the relevance for themselves, do not know that investigators are interested in the event and do not know at the time of witnessing that they will be interviewed about it. In direct contrast, for uninformed truth tellers the event they witness is very relevant: They know it is important to investigators and that they will be interviewed about it later. The only thing they are not informed about is that some elements of the event are more important to investigators than other elements uninformed truth tellers.

In the present experiment participants followed a target person. Lie tellers were asked to omit the key part of the event (the target meeting another person in a shopping centre). We did not include what truth tellers reported about this key event in our analyses when comparing truth tellers and lie tellers because lie tellers' lack of information about the key part simply reflects the result of the instruction lie tellers received. We label the parts of the event directly surrounding this key part (other target activities in the shopping centre) the essential parts of the event and the remaining parts (target walking to and from the shopping centre) the non-essential parts of the event. We compared truth tellers and lie tellers in reporting the essential and non-essential parts. Half of the participants were informed what the key part of the event was, the other half were not. We tested the following three hypotheses, which were pre-registered (<https://osf.io/fkdw7>).

Truth tellers will report more external, contextual and internal details about the essential and non-essential parts than lie tellers and also more complications. Their recall will also include a higher proportion of complications (Veracity main effect, Hypothesis 1).

Truth tellers in the informed condition will report more fully the essential parts of the surveillance mission than those in the uninformed condition, perhaps at the expense of reporting the non-

essential parts (Being Informed main effect for truth tellers only, Hypothesis 2a). Lie tellers in the informed condition will report more non-essential parts of the mission than the lie tellers in the uninformed condition, perhaps at the expense of reporting the essential parts (Being Informed main effect for lie tellers only, Hypothesis 2b). As a result of Hypotheses 2a and 2b, more pronounced veracity differences will occur in the informed condition than in the uninformed condition with truth tellers reporting more essential information and less non-essential information than lie tellers particularly in the informed condition (Veracity \times Being Informed interaction effect, Hypothesis 3).

To reduce the number of tests in the hypotheses-testing part of the experiment (and to increase statistical power) we report the results for complications and proportion of complications in the Results section. We report the results for common knowledge details and self-handicapping strategies in Appendix A.

4 | METHOD

4.1 | Participants

A G*Power analysis revealed that to obtain 99% power and a medium to large effect size ($f^2 = 0.2$), based on previous similar research in the deception detection area (Leal et al., 2020; Leal, Vrij, Deeb, Burkhardt, et al., 2023; Leal, Vrij, Deeb, & Fisher, 2023), at least 91 participants should be recruited. An initial sample of 131 participants were recruited, but seven participants did not follow the instructions. The final sample of 124 participants included 52 males and 72 females. Their average age was $M = 23.77$ ($SD = 8.65$). The largest group of participants ($n = 54$) were White British. The remaining participants were Asian ($n = 30$), White European ($n = 15$), African ($n = 13$), Arab ($n = 4$), Black British ($n = 3$) or other ($n = 5$). The highest level of education of most participants was A-levels ($n = 70$). Another 36 participants completed their bachelors and 17 their Masters. For one participant the highest level of education was O-levels.

4.2 | Procedure

We recruited participants through the participant pool, departmental databases, and university portals. The advertisement was entitled 'Can you be a good surveillance officer? Investigating credibility cues when individuals lie or tell the truth about a surveillance mission.' The advertisement mentioned that participants would be given a surveillance mission locally in (name of city where the university is located) to complete. The task was to follow a 'target of interest' without this target noticing that he was being followed. Participants would then be interviewed regarding what they experienced and witnessed during the surveillance mission. It was further mentioned that participants could be assigned to a condition whereby they would be asked to lie.

4.2.1 | The instructions

After signing the consent form, participants were instructed to complete a surveillance mission which involved following a target of interest (a confederate). The following instruction was given: 'I would like you to imagine that you are a new surveillance officer for the government. I am about to send you on a mission to follow this target of interest (participant was shown a picture of the confederate). We know that the target usually wears a blue bandana on their wrist and that he goes out for a walk for about 20 minutes at this time of day. As with any surveillance operation, it is very important that you ensure that the target is unaware that you are following him. You will later be debriefed in an interview about your mission'.

Participants were then randomly allocated to the uninformed ($n = 61$) and informed ($n = 63$) conditions. Those in the *uninformed condition* were instructed as follows: 'Please go and wait in the foyer downstairs and watch out for the target. Once the target (a male) appears please follow him. Use any tactics necessary to avoid being detected and pay attention to everything the target does as you will be interviewed about this later. Once the target has returned to the building your surveillance mission is over. Please report back to me'. Participants in the *informed condition* were given the same instructions as those in the uninformed condition with the following information being added: 'Please be aware that we are particularly interested to ascertain whether the target is meeting another person when he goes out—this intelligence is of high importance to us'.

All participants were informed that they would be entered into a draw for best surveillance officer whereby they could win up to £150 if the target they are following does not notice them.

4.2.2 | The mission

The mission consisted of a key part, essential parts and non-essential parts. The key part is the part participants in the informed condition were told the investigator was particularly interested in (meeting another person). It is underlined in the text below. We classified everything else that happened in the shopping centre (see below) as essential. We did so because the meeting with another person happened in the shopping centre, so the remaining shopping centre details were therefore very close in time to the key part of the event. Everything that happened outside the shopping centre was considered as non-essential.

Non-essential: The person of interest (target) left the University building and made his way through town to the [name of] shopping centre. Whilst walking to the shopping centre the target took some evasive actions ostensibly to avoid being followed. For example, he doubled back on himself; stopped and tied a shoelace; hid behind a telephone box and stopped at a cash machine.

Essential: When the target reached the shopping centre he acted in a shifty manner, looking around, peering in shops before taking out

his phone and making a call. During the call he looked to his right and located another person who was coming out of the shop. The target then proceeded to meet with the other person, they chatted briefly and the person handed him an envelope. The two then parted ways. The target stopped to put the envelope in his backpack before exiting the shopping centre via a different door.

Non-essential: After the target had exited the shopping centre, he made his way back to the University building via a different route to the one he had taken to arrive at the shopping centre.

4.2.3 | Post mission instructions

When participants returned to the lab, they were randomly assigned to the truth teller ($n = 61$) and lie teller ($n = 63$) conditions. Truth tellers were told to truthfully recall everything that they experienced during the mission. Lie tellers were told that the person who will interview them cannot be trusted. It is therefore vital not to mention specific parts of what the man they followed during the mission did. Specifically, they should omit that they witnessed him meeting another person (i.e., the part participants in the being informed condition were told is the key part of the event). They could be truthful about all other parts of the mission. In the data analyses we excluded what the truth tellers reported about this omission part and only analysed the reported details of the essential and non-essential parts.

All participants were then told that it is important to appear convincing. If the interviewer believes that they are being cooperative and telling the truth, they will be entered into a draw to win up to £150 in prize money. If the interviewer does not believe them, they will be asked to write a statement about what happened during the mission. In reality, no one had to write a statement and all those who completed the interview were entered into the draw. All participants were then given as much time as they needed to prepare for the interview.

4.2.4 | Pre-interview questionnaire

Once participants were ready to be interviewed, they completed a pre-interview questionnaire measuring background characteristics (age, gender, ethnicity, and level of education), motivation, preparation thoroughness and preparation time. Participants were asked how motivated they were to perform well during the interview on a 5-point scale ranging from 1 (*not at all motivated*) to 5 (*very motivated*). Participants indicated their preparation thoroughness via three items (1 = *shallow* to 7 = *thorough*; 1 = *insufficient* to 7 = *sufficient*; and 1 = *poor* to 7 = *good*). The answers to the three questions were averaged (Cronbach's alpha = .89). For preparation time one question was asked: 'Do you think the amount of time you were given to prepare was' (1 = *insufficient* to 7 = *sufficient*).

4.2.5 | The interview

The aim of the interview was to obtain a detailed recall of the mission. The interview consisted of three stages to achieve this aim. The first stage was an initial free recall. This was followed by a Model Statement, an audio-recording of an event unrelated to the topic of investigation (Leal et al., 2015). The Model Statement was followed by a second free recall. A Model Statement raises expectations about how much information someone is expected to provide (Ewens et al., 2016; Vrij et al., 2017) and typically leads to new information (information not provided in the first free recall) (Vrij, Leal, & Fisher, 2018). We used the Model Statement from Leal et al. (2015). Stage 3 of the interview was a request to recall part of the event (what happened in the shopping centre) in Reverse Order. A Reverse Order request facilitates memory recall (Fisher et al., 2002; Fisher & Geiselman, 1992) and typically results in new information (Memon et al., 2010; Vrij et al., 2012). The interviews were audio-recorded.

4.2.6 | Post-interview questionnaire

After the interview, participants completed the post-interview questionnaire which measured percentage of truth telling during the interview, the perceived likelihood of (i) having to write a statement, (ii) being entered into the prize draw and (iii) winning the prize of the best surveillance officer. Participants rated the extent to which they told the truth in the interview on an 11-point Likert scale ranging from 0% to 100% and the likelihood of having to write a statement, being entered into the prize draw and winning the prize of the best surveillance officer on 7-point Likert scales from 1 (*not at all likely*) to 7 (*very likely*).

Participants also completed the 21 item Deception Strategies Questionnaire (DSQ) designed by Leal, Vrij, Deeb, and Fisher (2023) representing the *tell it all* and *keep it simple* strategies as well as a *demeanour* strategy. Answers were given on 7-point Likert scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The *tell it all* strategy consisted of six items including: 'To also report details that I remembered but thought were insignificant' and 'To elaborate on specific details'. These six items were clustered into the *tell it all* index (Cronbach's $\alpha = .67$). The *keep it simple* strategy consisted of eight items including: 'To keep the story simple' and 'To describe the event in more general terms'. These eight items were clustered into the *tell it all* index (Cronbach's $\alpha = .75$). The *demeanour* strategy consisted of seven items including: 'To sound decisive and avoid hesitations' and 'To make the story sound unrehearsed and spontaneous'. These seven items were clustered into the *demeanour* index (Cronbach's $\alpha = .67$). Although we did not expect the *demeanour* strategy to be related to the dependent variables measured in the experiment, we included it in the questionnaire because it is a frequently cited strategy amongst truth tellers and lie tellers (Hartwig et al., 2007). Participants were finally asked to describe in their own words the strategy they used (if any) to appear convincing during the interview (open-ended question).

After completing the post-interview questionnaire participants were debriefed and remunerated.

4.3 | Coding

The interview recordings were first transcribed and then used for coding. Each detail was coded only once, so repetitions were ignored. In other words, when coding the details of Stages 2 and 3 of the interview only new details were coded. One rater, blind to the experimental conditions and hypotheses, coded external, contextual and internal details. *External details* refer to information that was gained from the senses. For example, the phrase 'The target exited the building. He had a blue bandana around his wrist' contains seven external details. *Contextual details* are descriptions of temporal or spatial relationships between objects and/or actors. The sentence 'He hid behind the telephone box and then went around the corner' contains two spatial details (behind and around) and one temporary detail (then). *Internal details* refer to information regarding the subjective mood of the interviewee. The sentence 'He walked past me, but then he turned back around. So I was really confused' contains one internal detail.

A second rater coded complications, common knowledge details and self-handicapping strategies. *Complications* are occurrences that affect the storyteller and make a story more complex (Vrij et al., 2021). Complications typically contain a cluster of details. The sentence 'I hid behind a tree so he couldn't see me' contains one complication. *Common knowledge details* is information that refers to strongly invoked stereotypical knowledge about the event (Vrij et al., 2021). Common knowledge details typically contain a cluster of details. The sentence 'He looked at the windows of the shops sometimes' contains one common knowledge detail. The individual details in complications and common knowledge details are also coded as external, contextual or internal details. *Self-handicapping strategies* are justifications as to why someone is not able to provide information (Vrij et al., 2021). The sentence 'There were many people in the shopping centre so I could not see very well what he was doing' contains one self-handicapping strategy. Complications, common knowledge details and self-handicapping strategies were combined into one dependent variable, the proportion of complications, defined as: complications/(complications + common knowledge details + self-handicapping strategies).

A third rater coded the external, contextual and internal details of a random sample of 72 transcripts (50% of the total) and a fourth rater coded the complications, common knowledge details and self-handicapping strategies in the same 72 transcripts. Both raters were blind to the experimental conditions and the hypotheses. Inter-rater reliability between the raters, using the two-way random effects model measuring consistency, was good for all verbal cues: External details (Single Measures ICC = 0.93), contextual details (Single Measures ICC = 0.84), internal details (Single Measures ICC = 0.64), complications (Single Measures ICC = 0.87), common knowledge details (Single Measures ICC = 0.71) and self-handicapping strategies (Single Measures ICC = 0.77).

To code the open-ended question, a rater first identified eight strategies the participants said they had used to be convincing during the interview and allocated the participants' responses to these eight categories. Responses could be allocated to more than one category at the same time. A second rater was given these eight strategies and also allocated the responses of all participants to these eight categories. The inter-rater reliability between the two coders was very good ($Kappa = .91$). The two raters resolved their disagreements in a meeting.

5 | RESULTS

5.1 | Questionnaire variables

A 2 (Veracity) \times 2 (Being Informed) between-subjects MANOVA was carried out with the 10 questionnaire variables listed in Table 2 as dependent variables. The multivariate Veracity main effect was significant, $F(10, 111) = 11.27, p < .001, \eta_p^2 = .50$, whereas the Being Informed main effect, $F(10, 111) = 0.60, p = .815, \eta_p^2 = .05$, and the Veracity \times Being Informed interaction effect, $F(10, 111) = 1.21, p = .294, \eta_p^2 = .10$, were not. The Veracity univariate main effects are presented in Table 1.

Only one significant effect emerged: Truth tellers reported to have told the truth more than lie tellers. Note that the percentage truth telling amongst lie tellers was high ($M = 79.05, SD = 14.34$) which reflects the assumption that lie tellers are largely truthful when telling an omission lie. The effect size of the Veracity effect was very large, $d = 1.87, 95\% CI [1.42, 2.26]$, which indicates that lie tellers considered deliberately omitting information as lying.

The average mean scores indicate that participants were very motivated to perform well during the interview ($M = 4.62 [SD = 0.55]$

on a 5-point scale). They also thought they were prepared for the interview ($M = 5.41 [SD = 1.24]$ on a 7-point scale) and were given sufficient time to prepare for the interview ($M = 6.32 [SD = 0.97]$ on a 7-point scale).

Although lie tellers were expected to endorse the keeping-it-simple strategy more than truth tellers and that truth tellers would endorse the tell-it-all strategy more than lie tellers, both strategies were endorsed by truth tellers and lie tellers to the same extent.

5.2 | Correlations between strategies and dependent variables

Table 2 presents the Pearson correlations between the three strategies and the six verbal cues. Only the keeping-it-simple strategy correlated with the dependent variables. This strategy was negatively correlated with reporting external, contextual and internal details, complications and proportion of complications and positively correlated with reporting common knowledge details. Self-handicapping strategies were not correlated with the keeping-it-simple strategy.

5.3 | Frequency of reported strategies (open-ended question)

Table 3 shows veracity differences in answering the open-ended question. Lie tellers reported to have used more strategies ($n = 102$) than truth tellers ($n = 77$). Lie tellers focussed more than truth tellers on the omission, which reflects the experimental manipulation. In addition, lie tellers focused more on their demeanour (e.g., gaze behaviour, movements) than truth tellers. Lie tellers also more than truth tellers reported just to have mentioned key aspects of the

TABLE 1 Questionnaire variables results as a function of veracity.

Question	Truth tellers		Lie tellers		<i>F</i>	<i>p</i>	<i>d</i>
	<i>M</i> (<i>SD</i>)	95% <i>CI</i>	<i>M</i> (<i>SD</i>)	95% <i>CI</i>			
Motivation (5-point scale)	4.67 (0.51)	4.53, 4.81	4.57 (0.59)	4.43, 4.71	1.00	.319	0.18 [−0.17, 0.53]
Preparation thoroughness (7-point scale)	5.52 (1.32)	5.20, 5.84	5.30 (1.16)	4.99, 5.61	1.00	.320	0.18 [−0.18, 0.19]
Preparation time (7-point scale)	6.33 (0.94)	6.08, 6.56	6.32 (1.00)	6.07, 6.56	0.01	.945	0.01 [−0.34, 0.36]
Truth telling (percentage)	98.70 (3.40)	96.01, 101.29	79.05 (14.34)	76.41, 81.60	110.31	<.001	1.87 [1.42, 2.26]
Likelihood to be entered into draw for being convincing in the interview (7-point scale)	4.75 (1.59)	4.37, 5.15	4.40 (1.50)	4.01, 4.79	1.69	.196	0.23 [−0.13, 0.58]
Likelihood to having to write a statement (7-point scale)	3.46 (1.76)	3.03, 3.88	3.51 (1.62)	3.08, 3.93	0.03	.873	0.03 [−0.32, 0.38]
Likelihood to win prize for the best surveillance officer (7-point scale)	3.84 (1.86)	3.39, 4.30	3.83 (1.80)	3.39, 4.28	.001	.975	0.01 [−0.35, 0.36]
Keeping it simple (7-point scale)	4.27 (1.29)	3.98, 4.58	4.49 (1.07)	4.20, 4.79	0.98	.324	0.19 [−0.17, 0.54]
Tell it all (7-point scale)	4.73 (1.19)	4.45, 5.03	4.70 (1.06)	4.42, 4.98	0.04	.844	0.03 [−0.17, 0.54]
Demeanour (7-point scale)	5.38 (0.89)	5.16, 5.62	5.51 (0.90)	5.29, 5.73	0.58	.449	0.15 [−0.21, 0.50]

TABLE 2 Pearson correlations between the reported strategies and verbal cues.

Verbal cue	Keeping-it-simple <i>r</i> (<i>p</i>)	Telling-it-all <i>r</i> (<i>p</i>)	Demeanour <i>r</i> (<i>p</i>)
External details	-.32 (<.001)	.03 (.729)	-.09 (.327)
Contextual details	-.33 (<.001)	.12 (.182)	-.06 (.521)
Internal details	-.18 (.049)	-.01 (.971)	-.03 (.764)
Complications	-.26 (.004)	.07 (.438)	-.13 (.154)
Proportion of complications	-.19 (.036)	.17 (.058)	.03 (.763)
Common knowledge details	.18 (.044)	-.13 (.160)	-.01 (.923)
Self-handicapping strategies	-.08 (.383)	-.13 (.165)	-.12 (.192)

TABLE 3 Strategies truth tellers and lie tellers reported to have used in the interview to appear convincing.

Strategy	Lie teller (102 responses) <i>n</i> (%)	Truth teller (77 responses) <i>n</i> (%)
Demeanour	33 (32%)	16 (21%)
Omission	25 (35%)	00 (00%)
Key details	10 (10%)	05 (06%)
Keep it simple	08 (08%)	02 (03%)
Tell it all	08 (08%)	27 (35%)
Consistency	06 (06%)	01 (01%)
Telling the truth	12 (12%)	20 (26%)
Other	00 (00%)	06 (98%)

mission and keeping their stories simple. More lie tellers than truth tellers said that they tried to be consistent during the three stages of the interview. Truth tellers more than lie tellers mentioned to have reported all details they could remember (tell it all) and focused on just telling the truth.

5.4 | Details in the omission part (truth tellers only)

Since lie tellers were instructed to omit the key part of the mission (meeting another person), we did not include the truth tellers' recall of that part of the mission in the hypotheses testing analyses. When reporting the key part of the mission truth tellers did not report any complications, common knowledge details and self-handicapping strategies. We carried out three between-subjects ANOVAs with the verbal cues they did report (external, contextual and internal details) as dependent variables and Being Informed as factor. The results are presented in Table 4.

The informed truth tellers reported more external and contextual details about the key part of the event than the non-informed participants. Truth tellers hardly reported any internal details when reporting the key part of the mission and the Being Informed instruction had no effect on the number of internal details reported.

5.5 | Hypothesis 1 (Veracity main effect) and Hypothesis 3 (Veracity × Being Informed interaction effect) testing

To test our hypotheses, we carried out frequentist analyses and Bayesian analyses. Bayesian analyses test the likelihood of the data under both the null hypothesis (H0) and the alternative hypothesis (H1) (Jarosz & Wiley, 2014). Bayes Factors (BF₁₀) between 1 and 3 indicate weak evidence for the alternative hypothesis (H1), between 3 and 20 indicate positive evidence, between 20 and 150 indicate strong evidence, and above 150 indicate very strong evidence (Jarosz & Wiley, 2014). A Bayes Factor close to 1 means no evidence can be derived from the data for either the null or the alternative hypothesis. The inverse of BF₁₀ is BF₀₁ (1/BF₁₀) which is the likelihood of supporting evidence for the null hypothesis (H0) compared to the alternative hypothesis (H1). We report only BF₁₀ statistics because BF₀₁ can be inferred by inverting BF₁₀.

A 2 (Veracity) × 2 (Being Informed) between-subjects MANOVA was carried out with the non-essential and essential external details, contextual details, internal details, complications and proportion of complications as dependent variables.¹ The multivariate Veracity main effect was significant, $F(10, 111) = 12.82, p < .001, \eta_p^2 = .54$, whereas the Being Informed main effect, $F(10, 111) = 1.69, p = .092, \eta_p^2 = .13$, and the Veracity × Being Informed interaction effect, $F(10, 111) = 1.24, p = .275, \eta_p^2 = .10$, were not. Even at a univariate level all Being Informed univariate main effects (all $F_s < 2.40$, all $p_s > .124$) and all Veracity × Being Informed univariate interaction effects (all $F_s < 2.13$, all $p_s > .146$) were not significant. The absence of any interaction effects implies that Hypothesis 3 was not supported. All univariate Veracity main effects are presented in Table 5.

Table 5 shows that no significant Veracity effects emerged in the non-essential details. For the essential details, with the exception of internal details, all effects were significant. Truth tellers reported more essential external and contextual details and more essential complications than lie tellers. Also, the proportion of complications score was higher for truth tellers than for lie tellers. The effect sizes ranged from medium ($d = 0.43$ for complications) to very large ($d = 1.51$ for external details). The Bayes Factors analyses showed very strong evidence for the external details and proportion of complications effects, strong evidence for the contextual details effect and weak evidence for the

TABLE 4 Univariate results for the details reported by truth tellers in the part lie tellers were instructed to omit as a function of being informed.

Detail type	Being informed		Not being informed		F	p	d
	M (SD)	95% CI	M (SD)	95% CI			
External details	17.63 (9.93)	14.47, 20.78	12.69 (7.64)	09.38, 16.00	4.66	.035	0.55 [0.03, 1.06]
Contextual details	10.53 (5.71)	08.67, 12.40	07.62 (4.75)	05.66, 09.58	4.63	.035	0.55 [0.03, 1.05]
Internal details	00.22 (0.42)	00.08, 00.36	00.17 (0.38)	00.02, 00.32	0.20	.656	0.12 [−0.38, 0.63]

TABLE 5 Univariate results for the verbal cues as a function of veracity.

Detail type	Truth tellers		Lie tellers		F	p	d	BF ₁₀
	M (SD)	95% CI	M (SD)	95% CI				
Non-essential (recalls 1, 2 and 3 combined)								
External details	45.67 (23.93)	39.09, 52.52	50.95 (28.43)	44.34, 57.54	01.17	.282	0.20 [−0.16, 0.55]	0.337
Contextual details	28.56 (13.65)	24.86, 32.27	27.13 (15.27)	23.50, 30.78	00.30	.588	0.10 [−0.26, 0.45]	0.220
Internal details	02.23 (02.60)	01.58, 02.83	02.28 (02.35)	01.67, 02.91	00.03	.855	0.02 [−0.33, 0.37]	0.193
Complications	05.72 (05.73)	04.46, 06.92	04.22 (03.75)	03.01, 05.43	02.84	.095	0.31 [−0.05, 0.66]	0.735
Proportion of complications	00.72 (00.36)	00.63, 00.81	00.71 (00.34)	00.62, 00.80	00.03	.855	0.03 [−0.32, 0.38]	0.193
Essential (recalls 1, 2 and 3 combined)								
External details	24.80 (08.90)	22.75, 26.78	12.86 (06.79)	10.89, 14.85	69.60	<.001	1.51 [1.09, 1.89]	6.383 × 10 ¹⁰
Contextual details	12.85 (05.37)	11.53, 14.19	09.41 (05.06)	08.12, 10.73	13.32	<.001	0.66 [0.29, 1.01]	69.935
Internal details	00.85 (01.22)	00.55, 01.16	00.62 (01.20)	00.32, 00.91	01.23	.269	0.19 [−0.17, 0.54]	0.323
Complications	02.16 (02.36)	01.68, 02.61	01.38 (01.10)	00.92, 01.84	05.42	.022	0.43 [0.06, 0.78]	02.41
Proportion of complications	00.84 (00.22)	00.77, 00.91	00.52 (00.34)	00.45, 00.59	38.48	<.001	1.11 [0.72, 1.47]	5.674 × 10 ¹³

complications effect. The findings therefore show general support for Hypothesis 1.

Appendix A shows the statistical information for the common knowledge details and self-handicapping strategies. Lie tellers reported more common knowledge details and more self-handicapping strategies when reporting the essential part of the mission. No Veracity effects occurred when reporting the non-essential part of the mission.

5.6 | Hypothesis 2 (Being Informed main effect) testing

To test Hypothesis 2a, a between-subjects MANOVA was carried out for the truth tellers only with Being Informed as factor. The dependent variables were the non-essential and essential external details, contextual details, internal details, complications, and proportion of complications. The multivariate effect was not significant, $F(10, 50) = 1.16$, $p = .342$, $\eta_p^2 = .19$. Also at a univariate level, none of the effects were significant, all $F_s < 2.12$, all $p_s > .151$). Hypothesis 2a was therefore not supported.

To test Hypothesis 2b, a between-subjects MANOVA was carried out for the lie tellers only with Being Informed as factor. The dependent variables were the non-essential and essential external details,

contextual details, internal details, complications, and proportion of complications. The multivariate effect was not significant, $F(10, 52) = 1.55$, $p = .150$, $\eta_p^2 = .23$. At a univariate level, only a significant effect emerged for essential internal details, $F(1, 61) = 4.89$, $p = .031$, $d = 0.56$ [0.05, 1.05]. All other univariate effects were not significant, all $F_s < 1.01$, all $p_s > .317$. Uninformed lie tellers ($M = 0.94$, $SD = 1.48$, 95% CI [0.53, 1.35]) reported more internal details than informed lie tellers ($M = 0.29$, $SD = 0.69$, 95% CI [−0.13, 0.71]). The Bayes Factors analysis shows weak evidence for this effect $BF_{10} = 1.95$. Hypothesis 2b was therefore not supported.

6 | DISCUSSION

The truthful information lie tellers reported included verbal cues to deception. Truth tellers reported more complications than lie tellers. The same finding emerged in the previous three omission lies experiments (Leal et al., 2020; Leal, Vrij, Deeb, Burkhardt, et al., 2023; Leal, Vrij, Deeb, & Fisher, 2023). There is thus growing evidence that complications is a diagnostic veracity indicator in omission lies. Truth tellers also reported more external and contextual details than lie tellers. The same finding emerged in Leal, Vrij, Deeb, and Fisher (2023), the only other omission lies experiment in which external and contextual details were measured. More research is needed to obtain a good picture about the relationship

between reporting details and veracity in omission lies but some details (e.g., external and contextual detail) may be more diagnostic indicators of veracity than other details (internal details). Common knowledge details and self-handicapping strategies were examined for the first time in omission lies research. Lie tellers reported more common knowledge details and self-handicapping strategies. The proportion of complications was in the present experiment also lower for lie tellers than for truth tellers.

Embedded lies research showed the same findings as the present experiment. Also in embedded lies scenarios truth tellers report more external and contextual details (Amado et al., 2016; Gancedo et al., 2021), more complications, a higher proportion of complications and fewer common knowledge details and self-handicapping strategies than lie tellers (Vrij et al., 2021). The emerging picture therefore is that embedded lies and omission lies scenarios result in similar verbal veracity cues. The strategies lie tellers use explains why the same verbal veracity cues emerged in embedded and omission lies scenarios. In both types of lie scenario, lie tellers, more than truth tellers, are inclined to employ a keeping-it simple strategy. In the present example we found this when analysing the open-ended question, particularly if we consider the strategy 'focus on key parts of the event' as a form of keeping it simple. We found that keeping-it-simple was negatively correlated with reporting details (essential, contextual, and internal), complications and ratio of complications and positively correlated with reporting common knowledge details.

Unlike the open-ended question, the deception strategies questionnaire did not reveal veracity differences. This means that in the two experiments in which the questionnaire was used (also in Leal, Vrij, Deeb, & Fisher, 2023), it revealed veracity differences in one experiment but not in the other experiment. People do not always have insight into their own thoughts and actions (Nisbett & Wilson, 1977) and more research is required to determine the usefulness of the questionnaire to reveal deception strategies.

It would be encouraging if the pattern of results that emerged in the present experiment—omission lies and embedded lies research show similar findings—could be replicated in future omission lies research. In real life, it may be difficult for practitioners to assess whether someone tells an omission lie or an embedded lie. Being able to make that distinction would be important if these two types of lie result in different veracity indicators but would be less important if they result in the same veracity indicators.

For the first time in omission lies research, we split the event in three parts: Key part (target meeting someone else and the part lie tellers were instructed to omit), essential part (parts surrounding the key part) and non-essential part (remaining parts). As predicted, truth tellers reported more details about the essential part of the event than lie tellers. In the participants' minds meeting someone else (key part of the event) may have been linked to the other activities in the shopping centre (essential parts of the event). Consequently, lie tellers may have employed the keeping-it-simple strategy predominantly when discussing all that happened in the shopping centre which would explain why the veracity differences particularly occurred when reporting that part of the event.

Lie tellers did not report more details than truth tellers about the non-essential part of the event. We expected this to happen because

we thought lie tellers would compensate for the lack of detail reported about the key event (the part they omitted) and the surrounding parts. We can only speculate about the reason why we failed to obtain the expected effect. Perhaps lie tellers have an idea about the minimum amount of information they need to report about an event to come across as being cooperative (e.g., threshold). Perhaps they felt that in the current experiment they reached that threshold without having to elaborate on the non-essential parts.

Referring to essential and non-essential parts differs from referring to core and peripheral information, another distinction made in deception research (Leal et al., 2018, 2019). Core and peripheral information relates to what is important or less important information from the perspective of the *story teller*. In the present experiment, all information the participants reported was considered important (core) but was more essential or less essential for the *listener*. For example, it might be of particular interest to an intelligence handler that the target met another person, and whilst the lie teller knows this is essential information (because they are asked to omit it) a truth teller often does not.

Only when truth tellers are informed about the key part of the event, the essential information could be considered core and the non-essential information peripheral. We expected that being informed about the key part of the event (target person meeting someone else) would have a differential effect on truth tellers and lie tellers when reporting the remaining parts of the event. We did not find this. Truth tellers who were informed about the key part of the event reported more details about this part of the event (Table 4) than the uninformed truth tellers (suggesting that the manipulation had an effect) but being informed had no effect on truth tellers in reporting the parts of the event that surrounded the key part of the event (essential parts) or the remaining parts of the event (non-essential parts). Being informed had no effect on lie tellers either. A possible explanation is that meeting someone else was seen as the key part of the event by all participants, regardless of being informed about it or not. Although the key activity of the target person may have become clear to lie tellers when they were instructed to omit this part, we did not think it would be necessarily clear to truth tellers. We expected participants to spend a lot of attention and energy in making sure that the target would not notice that they followed him. Therefore, considering the activities of the target person, would then become a second priority. With hindsight it would have been better if we had asked participants what they thought the key part of the mission was.

AUTHOR CONTRIBUTIONS

Sharon Leal: Conceptualization; methodology; writing – review and editing; supervision. **Aldert Vrij:** Funding acquisition; writing – original draft; formal analysis; methodology. **Haneen Deeb:** Investigation; writing – review and editing; supervision; methodology. **Ronald P. Fisher:** Writing – review and editing; methodology.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTE

¹ In the pre-registration we proposed a 2 (Veracity) × 2 (Being Informed) × 2 (Part of the mission) factorial design which Part of the mission referring to essential and non-essential details. The disadvantage of this design is that the Part of the mission main effect and the Being Informed × Part of the mission interaction effect are not relevant (no hypotheses were formulated) and that presenting this design would unnecessarily complicate the Results. This factorial design resulted at a multivariate level in significant main effects for Veracity, $F(5, 116) = 2.89, p = .017, \eta_p^2 = .11$, and Part of the mission, $F(5, 116) = 52.22, p < .001, \eta_p^2 = .35$ and in significant interaction effects for Veracity × Part of the mission, $F(5, 116) = 12.74, p < .001, \eta_p^2 = .35$, and Being Informed × Part of the mission, $F(5, 116) = 2.81, p = .020, \eta_p^2 = .11$. The other multivariate effects were not significant, all $F_s < 2.09$, all $p_s > .070$. In other words, these results reflect what we report in the main text. That is, Veracity effects were dependent on which part of the mission was discussed and Being Informed had no differential effect on truth tellers and lie tellers.

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> APPENDIX A: UNIVARIATE RESULTS FOR THE COMMON KNOWLEDGE DETAILS AND SELF-HANDICAPPING STRATEGIES AS A FUNCTION OF VERACITY

A 2 (Veracity) \times 2 (Being Informed) between-subjects MANOVA was carried out with the non-essential and essential common knowledge details and self-handicapping strategies as dependent variables. The multivariate Veracity main effect was significant, $F(4, 117) = 13.18, p < .001, \eta_p^2 = .31$, whereas the Being Informed main effect, $F(4, 117) = 0.87, p = .485, \eta_p^2 = .03$, and the Veracity \times Being Informed interaction effect, $F(4, 117) = 1.36, p = .254, \eta_p^2 = .04$, were not. Even at a univari-

ate level all Being Informed univariate main effects (all $F_s < 1.72$, all $p_s > .190$) and all Veracity \times Being Informed univariate interaction effects (all $F_s < 2.43$, all $p_s > .121$) were not significant.

The table shows that the two non-essential Veracity effects were not significant and the Bayes Factors do not provide support for the alternative hypothesis either. For the essential details, lie tellers reported more common knowledge details ($d = 1.04$) and more self-handicapping strategies ($d = 0.53$) than truth tellers. The Bayes Factors analyses showed very strong evidence for the common knowledge details effect and positive evidence for the self-handicapping strategies effect.

Detail type	Truth tellers		Lie tellers		<i>F</i>	<i>p</i>	<i>d</i>	BF ₁₀
	<i>M</i> (SD)	95% CI	<i>M</i> (SD)	95% CI				
Non-essential (recalls 1, 2 and 3 combined)								
Common knowledge details	00.69 (00.82)	00.45, 00.92	00.94 (01.00)	00.71, 01.16	02.28	.134	0.27 [−0.08, 0.62]	0.531
Self-handicapping strategies	00.05 (00.28)	00.00, 00.10	00.00 (00.00)	−0.05, 00.05	01.73	.191	0.25 [−0.10, 0.60]	0.449
Essential (recalls 1, 2, and 3 combined)								
Common knowledge details	00.13 (00.39)	−0.09, 00.35	01.02 (01.14)	00.80, 01.23	32.52	<.001	1.04 [0.65, 1.40]	6.216 \times 10 ⁶
Self-handicapping strategies	00.12 (00.32)	−0.04, 00.26	00.43 (00.76)	00.28, 00.58	08.80	.004	0.53 [0.16, 0.88]	10.09