Detection of Concealment in an Information-Gathering Interview

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Abstract

Deception researchers have suggested that when truth tellers and liars carry out the same activities, verbal differences in reporting such activities are unlikely to occur. We argue that liars will report these activities in less detail than truth tellers, due to a tendency to be less forthcoming with information relating to their deception.

In the present experiment, truth tellers and liars carried out the same activities for benevolent (truth tellers) or malevolent (liars) reasons, and were asked to report these activities in a free recall phase and in a cued recall phase. In the cued recall phase half of the participants were asked to recall the information with their eyes closed. Liars' accounts were less detailed than truth tellers' accounts in the free recall phases of the interview. Eye closure resulted in the reporting of more detail by truth tellers and liars. The theoretical and applied implications of these findings are discussed.

Detection of Concealment in an Information-Gathering Interview

A security agent shadows a target individual who crosses a road, catches a train, and visits a cafe. During those activities the target individual approaches a street cleaner, receives a phone call, checks some door locks on the square, and receives two further phone calls. When asked what he has been doing he says that he is organising a surprise birthday party for a friend. Is this story true or is there a more malevolent intention behind this sequence of actions in a public space?

Lie detection in the scenario outlined above is difficult. When asked to describe their activities in detail an individual with questionable intentions can be entirely truthful and forthcoming about having engaged in such activities; s/he just needs to conceal the reasons for doing so. Lie detection methods such as the Concealed Information (polygraph) Test (Verschuere, Ben-Shakhar, & Meijer, 2011) cannot be used because the person is openly admitting his/her activities. In terms of verbal lie detection the prospects for successful lie detection seem equally bleak. Deception researchers have consistently argued that in situations where liars can truthfully recall their activities, their strategies may not differ and, as a result, liars may look and sound a lot like truth tellers (Leins, Fisher, & Ross, 2013; Vrij, 2008). However, this assumption has not been empirically tested to date. Typically, in deception research truth tellers and liars carry out different activities and liars are instructed to feign that they have carried out the truth tellers' activities (Vrij, 2008). A reason for predominantly using this research paradigm is that it reflects an important aspect of real life deception. According to a diary study about lying in everyday life, just over 60% of the lies told are outright lies (fabrications) (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996).

Given that certain practitioner groups (e.g., undercover police officers, intelligence officers) encounter scenarios such as the one described above on a regular basis, we examined

how truth tellers and liars who carried out the same activities (albeit for different reasons) describe such activities. We predicted that truth tellers' and liars' descriptions would differ from each other, because liars are less forthcoming than truth tellers with information relating to their deception. During interviews liars need to decide what information to convey, deny or avoid (Granhag & Hartwig, 2008). It makes little sense for liars to withhold information that they believe will be harmless to reveal. In fact, liars may be keen to provide such innocuous information in order to appear convincing. Their aim will be to make an honest impression on interviewers and liars think they can achieve this by providing a detailed account (Nahari, Vrij, & Fisher, in press). Indeed, research has shown that an account perceived to be detailed is more likely to be believed (Bell & Loftus, 1989; Johnson, 2006; Johnson, Foley, Suengas, & Raye, 1988). Liars, however, also have a tendency to withhold information that they believe could be potentially incriminating (Hartwig, Granhag, Strömwall, & Kronkvist, 2006; Hartwig, Granhag, Strömwall, & Vrij, 2005). Such a response is related to basic forms of human behaviour concerning *avoidance* and *escape* (Carlson, Buskist, & Martin, 2000; Granhag & Hartwig, 2008). In terms of self-regulation this is viewed as a manner of establishing control – by avoiding the aversive event altogether (Granhag & Hartwig, 2008). In the scenario described above, wrongdoers could easily give an innocent explanation for their activities – which means that they can present themselves in a forthcoming manner similar to truth tellers. However, people typically think that their state of mind 'shines' through or will be immediately apparent to others (Granhag, Strömwall, & Hartwig, 2007; Kassin & Gudjonsson, 2004; Vrij, Mann, & Fisher, 2006). This phenomenon could be explained by the *illusion of transparency* (Gilovich, Savitsky, & Medvec, 1998), the belief that one's inner feelings will manifest themselves to external observers. Given this tendency, it may be that despite carrying out the same activities as truth tellers, liars may think that these activities will appear suspicious and, therefore, decide not to report them. In addition, liars often view the presence of witnesses as

potentially incriminating because witnesses can serve as additional information sources against which investigators can check the veracity of the liar's statement (Granhag & Hartwig, 2008; Nahari, Vrij, & Fisher, 2012, in press; Jundi, Vrij, Hope, Mann, & Hillman, in press). Consistent with this notion, it has been demonstrated that liars include fewer witnesses in their drawings (Vrij, Leal et al., 2010; Vrij, Mann, Leal, & Fisher, 2012) or verbal accounts (Jundi et al., in press) than truth tellers. We therefore predicted that when discussing their activities liars would be less forthcoming than truth tellers by providing less information about their activities (Hypothesis 1).

One aim of an investigative interview is to encourage interviewees to recall and report all relevant information they can remember (Bull, 2010; Fisher, 2010). There are several ways to help people to remember and report more information in the course of an interview, one of which is by asking people to close their eyes while discussing their activities (Perfect et al., 2008; Vredeveldt, Baddeley, & Hitch, 2012; Vredeveldt, Hitch, & Baddeley, 2011, 2013; Vredeveldt & Penrod, 2012). Fisher and Geiselman (1992) argued that closing the eyes facilitates recall because it leads to more focussed concentration and blocks out visual (and perhaps other) sources of interference (see also Glenberg, Schroeder, & Robertson, 1998, and Wagstaff et al., 2004). This is in alignment with the cognitive load hypothesis, derived from Glenberg's (1997) embodied cognition account of memory, which argues that environmental monitoring and memory retrieval are two tasks competing for cognitive resources. Therefore, eye closure frees up cognitive resources that would otherwise have been involved in monitoring the environment, and subsequently improves memory (Perfect et al., 2008). Apart from this general process, Vredeveldt et al. (2012, 2013) proposed a modality-specific process, suggesting that eye-closure would be more helpful for recall of visual information than for recall of auditory information. Vredeveldt et al. (2011) found that both general and modality-specific processes were responsible for the eye closure effect. Given the beneficial

effect of eye closure on recall, it is recommended as an interview technique and is often used in the Cognitive Interview, an interview protocol originally designed to enhance the recollection of cooperative witnesses (Fisher & Geiselman, 1992; Fisher, 2010).

The interview in the present experiment consisted of two sections. In the first phase (labeled free recall phase) both liars and truth tellers were allowed to freely select the information they wished to report via a free recall. In the second phase, (labeled cued recall phase) participants were asked a series of cued recall questions to determine whether interviewer-led questioning produced a difference between liars and truth tellers. As a further manipulation in the cued recall phase, half of liars and half of the truth tellers were given an eye closure instruction to see if this technique, shown to elicit more detailed recall (Perfect et al., 2008; Vredeveldt, Baddeley, & Hitch, 2012, 2013; Vredeveldt, Hitch, & Baddeley, 2011; Vredeveldt & Penrod, 2013) would amplify any differences between the veracity groups. We predicted that the eye closure instruction would increase the amount of information provided by both truth tellers and liars (Hypothesis 2, eye closure main effect). Furthermore, eye closure may benefit truth tellers more than liars because liars are less forthcoming. Thus, it could be that liars will remember additional information when they engage in retrieval with their eyes closed, yet choose not to report these additional details in the interview. We therefore predicted that the eye closure instruction would increase the amount of information provided during the interview more for truth tellers than for liars (Hypothesis 3, Veracity X Eye Closure interaction effect).

We were also interested in the extent to which liars would attempt to try to 'cover their tracks' by acknowledging a potentially incomplete report. At the end of the experiment the participants completed (truthfully) a questionnaire about their memory and recall. We predicted that liars would be more likely than truth tellers to report that they remembered details that they did not discuss during the interview (Hypothesis 4). Based on the idea that

liars are inclined to avoid incriminating information and are less forthcoming, we predicted that liars would be more likely than truth tellers to indicate that they did not report such details because they thought that they would sound suspicious (Hypothesis 5), or because they thought that these details were not important enough (Hypothesis 6).

Method

Participants

A total of 88 participants took part, of whom 37% were male. Their average age was M = 23.03 (SD = 6.55). Participants were recruited via posters and leaflets, and online via advertisements on the university's staff and student portals. The study was advertised as 'Can you keep a secret?' whereby participants were invited to take part in a reconnaissance mission and advised they could receive a £15 reward for a convincing report of the mission. The study was approved by the Department of Psychology ethics committee.

Procedure

Mission "briefing". Truth tellers (N = 44) were told that they were about to embark on a mission to organise a surprise party for a friend near the university. Liars (N = 44) were told that their mission was to gather information about installing a decoy device in public venues in the vicinity of the university. As part of this initial briefing, all participants were told they would walk to the park to ask a street cleaner whether or not the park stays open all night. The participants were told that if open, the park would be a suitable place to leave a decoy device overnight (liars) or for party attendees to stay overnight (truth tellers). They were then told they would walk to the city square to await a phone call providing further instructions. They were also told that they would take a 6-minute train ride to a nearby shopping complex to identify some possible venues in which to hold the party (truth tellers)

or to place the decoy device (liars). They were also informed that a collaborator (for liars) or fellow party organiser (for truth tellers) would meet them on the train to complete the rest of the mission with them (but this second person never appeared). After visiting a venue in the shopping complex participants were told they would return to the Department to report their findings in an interview. Liars were also told to use a cover story that paralleled the truth tellers' mission (that the activities they engaged in concerned organising a surprise party for a friend) and were informed about the reasons given to truth tellers as to why they needed to carry out specific activities. All participants were given a bag containing a cell phone, a train ticket, some loose change, maps of the area and a photo of the collaborator / fellow party organiser they were to meet on the train.

Mission activities. Each participant walked from the Department to a nearby park to meet the street cleaner (a disguised confederate). The street cleaner told participant that the park closes at 11pm. The participant then walked to a nearby square and awaited a phone call with further instructions. During the phone call the participant was asked about what the street cleaner said, and was told that as the park was not an option, they should, as an alternative, check some doors to an underground car park accessed via a set of stairs beside a statue nearby. Liars were asked to check whether this was a potential site in which to leave a decoy device, truth tellers were informed it was to check if party attendees could spend the night there under cover (in fact, the doors to the underground car park did not open). In the same phone call, the participant was told to then catch a specific train to their next destination.

Whist walking to the train station, the participant was approached and asked some questions by an undercover interviewer posing as a student conducting a survey on transport. The participant then proceeded to catch the train to the shopping centre. Whilst on the train, the participant was phoned and told that the person they were supposed to meet had been

delayed and would not be meeting them; therefore they were to complete the remainder of the mission by themselves. Once the participant alighted they were phoned for the third time and received instructions to go to a specific bar to assess it as a party venue (for truth tellers) or decoy device site (for liars).

From the train station onwards the participants were shadowed by a confederate to check that all mission activities were completed as instructed and to maintain the security of the participant. All missions were completed as planned and none of the participants mentioned that they felt that they had been shadowed.

On return to the interview room, truth tellers were advised to recount their activities honestly, whereas liars were told that they needed to report their cover story in the interview. Both liars and truth tellers were told that if they convinced the interviewer that they were telling the truth about their mission, they would receive £15 for participating in this study. They were also informed that if they did not convince the interviewer, they would instead have to write a statement about what occurred during the mission. Participants were given ten minutes to prepare themselves for interview. The interview was conducted in an information-gathering style. It started with a general question typically asked in information-gathering interviews "Describe in as much detail as possible what you did this afternoon during your mission" (hereafter called free recall). The interviewer then proceeded with specific follow-up questions, with half of the participants (N = 44) instructed to answer these questions with their eyes closed. The follow-up questions asked for further detail about each part of the mission, repeating at the outset of each question what the participant had reported (e.g., "So you walked from here to the park, describe what happened on the way and at the park?; 'So you then walked from the park to the square, what happened at the square?). We restricted the eye closure procedure to the cued recall phase as providing information to an interviewer when one's eyes are closed requires trust in the interviewer (see, for example, work on the

Cognitive Interview; Fisher & Geiselman, 1992). Thus, in our study, participants were requested to close their eyes during their second recall attempt (cued recall) to allow time for such trust to develop during the initial free recall phase.

The interview was openly videotaped. After the interview participants were given a post interview questionnaire, which all participants (including liars) were requested to answer truthfully. The post interview questionnaire addressed the extent to which participants had (i) remembered details that they did not discuss during the interview, (ii) not discussed details during the interview that they remembered because they thought they were not important enough to report, and (iii) not discussed details during the interview that they remembered because they thought they may have sounded less truthful when reporting them. Answers were provided on Likert scales ranging from (1) not at all to (7) very much so. The post-interview questionnaire also included the three manipulation checks to assess the extent to which participants were motivated to appear convincing during the interview, what they thought the likelihood was of getting the £15 reward and how likely it was that they would have to write a statement Answers were given on Likert scales ranging from (1) very unlikely to (7) very likely.

After completing the questionnaire the participants were thanked and debriefed. All participants were paid the same amount (£15) for participating in the study.

Coding

The interviews were videotaped and transcribed, and these transcripts were the basis for all verbal coding. We used 'information' as a dependent variable and we coded this in two different ways. First, we coded the number of details reported and we had previously trained two raters to code visual, spatial, temporal, auditory, and action details. Accuracy of the detail was not recorded due to an absence of due to a lack of ground truth about what exactly has happened during each individual mission. The two raters individually coded the

statements from the present study. They were both blind to the hypotheses under

investigation, to the nature of the staged event, and to the experimental condition. One rater

coded all the statements and a second rater coded a random sample of 16 statements (18% of

the total). The two raters coded per interview the frequency of occurrence of visual details

(e.g., "I went back to the train station " contains two visual details); spatial details (e.g.,

"There were steps going down" contains one spatial detail), temporal details   (e.g., "When I

was at Guildhall…" contains one temporal detail); auditory details (e.g., "A woman and a

boyfriend were shouting at each other" contains one auditory detail); and the participant's

action details (e.g., "I was glancing at the screen" contains one action detail). The frequency

scores of the two raters correlated highly with each other for each of the verbal cues: visual

details, Intra-Class Correlation (ICC) is =. 87; spatial details, ICC = .82; temporal details,

ICC = .94; auditory details, ICC = .67; and action details, ICC = .84. For the analyses we

merged all the details into one cluster, '*detail*'. The ICC for that cluster was .95, and the

cluster represents the total number of detail reported by the interviewee.

Second, we introduced an applied dependent variable called 'observable evidence'.

These were specific events which took place during the mission that would have been

observable to an undercover officer shadowing the participants. Given that undercover

officers often restrict themselves to shadowing a suspect without actually interviewing them,

but then inform colleagues (who could be interviewers) about what they have witnessed, this

is a useful measure. That is, undercover officers could inform the interviewers what they have

seen, and the interviewers could subsequently check whether the interviewee mentions these

activities during the interview. During the mission participants (i) approached a street cleaner,

(ii) received a phone call, (iii) checked some doors, (iv) were approached by someone

conducting a survey, (v) received a phone call on the train, and (vi) received a phone call at

the train station. The raters were instructed to note any explicit mention of these six events in

the interview transcripts (the second rater coded a random sample of 16 statements). The score on this observable evidence variable could range from 0 (none of the pieces of evidence were reported to 6 (all six pieces of evidence were reported) and the inter-rater coder reliability for this variable was ICC = .86.

Results

Manipulation Checks

Truth tellers ($M = 6.43$, $SD = 1.00$) and liars ($M = 6.43$, $SD = .79$) were equally motivated to appear convincing, $F(1, 86) < 1$. In fact, 95% of the participants reported being motivated (score of 5 or higher on the 7-point Likert scale) and 63% reported to be highly motivated (7 on the 7-point Likert scale).

In addition, truth tellers ($M = 5.66$, $SD = 1.41$) were more convinced than liars ($M = 4.86$, $SD = 1.56$) that they would receive the £15 cash reward for being convincing in the study, $F (1, 86) = 6.27$, $p = 0.010$, $d = 0.54$, whereas liars ($M = 4.09$, $SD = 1.87$) were more convinced than truth tellers ($M = 3.11$, $SD = 1.70$) that they would likely have to write a statement as a punishment, $F (1, 86) = 6.59$, $p = 0.012$, $d = 0.55$.

Free Recall Phase

A MANOVA with Veracity as factor and 'observable evidence', and 'detail' as dependent variables revealed a significant multivariate effect, $F(2, 85) = 12.07$, $p < .0001$, $eta^2 = .22$. The univariate results and statistics are shown in Table 1. Truth tellers reported more observable evidence than liars and more detail than liars, thereby supporting Hypothesis 1. Three discriminant analyses were carried out. In all three analyses 'Veracity' was the criterion. In one analysis 'observable evidence' was the predictor, in a second analysis 'detail' was the predictor and in a third analysis, in which we used the stepwise method,

'observable evidence' and 'detail' were both included as predictors. The analysis with 'observable evidence' as predictor classified 68% of truth tellers and 77% of liars correctly, $\chi^2(1) = 21.37$, Wilk's Lambda = .78, $p < .0001$. The discriminant analysis with 'detail' as predictor resulted in correct classifications of 48% of truth tellers and 77% of liars, $\chi^2(1) = 8.66$, Wilk's Lambda = .90, $p < .003$. The analysis with 'observable evidence' and 'detail' as predictors revealed that observable evidence emerged as the sole predicting variable of veracity ($\chi^2(1) = 21.37$, Wilk's Lambda = .78, $p < .0001$).

Cued Recall Phase[1]

A 2 (Veracity) X 2 (Eye Closure) MANOVA with 'observable evidence' and 'detail' as dependent variables revealed a significant multivariate main effect for Veracity, $F(2, 83) = 10.20$, $p < .0001$, $eta^2 = .20$. The Eye Closure multivariate main effect was not significant, $F(2, 83) = 2.02$, $p = .140$, $eta^2 = .05$, neither was the Veracity X Eye Closure multivariate interaction effect, $F(2, 83) = 1.261$, $p = .289$, $eta^2 = .03$.

Table 2 shows the univariate results and statistics for Veracity. Table 2 shows that, again, truth tellers mentioned more observable evidence than liars. However, no difference between truth tellers and liars emerged in the number of details provided. Thus Hypothesis 1 was only partially supported (i.e. support was found for the observable evidence variable but not for the detail variable). We carried out the same three discriminant analyses as carried out in the free recall phase analyses. In the analysis with the observable evidence variable as predictor, 71% of truth tellers and 64% of liars were classified correctly, $\chi^2(1) = 18.04$, Wilk's Lambda = .81, $p < .0001$. The analysis with the detail variable as predictor resulted in correct classifications of 57% of truth tellers and 16% of liars and a non-significant discriminant function, $\chi^2(1) = 0.005$, Wilk's Lambda = 1.00, $p = .945$. The analysis with both observable

evidence and detail as predictors revealed that observable evidence emerged as the sole predicting variable of veracity ($\chi^2(1) = 18.04$, Wilk's Lambda = .81, $p < .0001$).

Since we had hypothesised an effect for Eye Closure, we examined the univariate results despite the absence of a multivariate main effect. The univariate results for Eye Closure showed that closed eyes recall ($M = 282.87$, $SD = 271.08$) resulted in more detail than open eyes recall ($M = 196.56$, $SD = 93.22$), $F(1, 84) = 4.01$, $p = .048$, $d = .48$. The difference in mentioning observable evidence between closed eyes recall ($M = 2.66$, $SD = 1.43$) and open eyes recall ($M = 2.77$, $SD = 1.23$) was not significant, $F(1, 84) = .37$, $p = .544$, $d = .08$. This partially supports Hypothesis 2 (support was found for detail but not for observable evidence).

At a univariate level both Veracity X Eye Closure interaction effects were not significant (both $F's < 2.54$, both $p's > .160$), which means that Hypothesis 3 was rejected.[2]

Post-Interview Questionnaires

A MANOVA with Veracity and Eye Closure as factors and the questionnaire data presented in Table 3 as dependent variables revealed a significant multivariate main effect for Veracity, $F(3, 82) = 6.68$, $p < .001$, $eta^2 = .20$. The Eye Closure main effect, $F(3, 82) = 2.08$, $p = .109$, $eta^2 = .07$, and the Veracity X Eye Closure interaction effect, $F(3, 82) = 1.07$, $p = .366$, $eta^2 = .04$, were not significant. At a univariate level, all three Veracity main effects were significant. As Table 3 shows, liars were more likely to report that they remembered details that they did not discuss during the interview (Hypothesis 4), and were also more likely to indicate that they did not report some detail because they thought that to do so would make them attract suspicion (Hypothesis 5). In addition, liars agreed more strongly than truth tellers that they did not report some detail because they thought they were not important enough (Hypothesis 6).

Discussion

In the present experiment truth tellers and liars carried out the same activities - but for different reasons. Truth tellers' and liars' statements differed from each other in terms of amount of information provided, with liars providing less details and observable evidence than truth tellers when describing the same activities. This finding is important. Deception researchers have argued that in situations where liars can truthfully recall their activities, their strategies may not differ and, as a result, liars may look and sound a lot like truth tellers (Leins, Fisher, & Ross, 2013; Vrij, 2008). The present findings revealed that the content of truth tellers' and liars' reports may well differ even when they discuss identical activities.

Why do liars provide less information than truth tellers when providing reports about these seemingly innocuous activities? Although carrying out the same activities as truth tellers, liars may think that these activities appear more suspicious, and as such, may be hesitant to report these activities. Self-reported post-interview data provides further support for these suppositions. Liars were more likely than truth tellers to report that they had not conveyed all the information they had remembered. In comparison with truth tellers, they were more likely to indicate that they thought the information would sound suspicious or they thought the information was not important enough to report.

Participants who recalled their stories with their eyes closed reported more information than those who reported their stories with their eyes open, providing support for the notion that eye closure assists recall. The eye closure manipulation had the same effect on truth tellers and liars, and, as such, did not help to discriminate between the two. While the eye closure instruction did not aid discriminability in the current context where liars could honestly recall all their activities, eye closure may have the potential to elicit cues to deceit in situations where liars have to fabricate their answers. Experimental manipulations which have

shown to encourage examinees to talk (e.g., being interviewed by an interviewer who shows a positive demeanour; listening first to a model interviewee who provides a detailed statement), also demonstrated a differential effect on truth tellers and liars who have to fabricate their answers, with truth tellers but not liars providing more detail (Mann, Vrij, Shaw, Leal, Ewens, Hillman, & Granhag, 2013) and with truth tellers but not liars providing more plausible statements (Leal, Vrij, Warmelink, Vernham, & Fisher, 2013). Liars may find it too difficult cognitively to add as many details as truth tellers do. Alternatively, if liars do add sufficient amount of detail, the additional information may be of lesser quality or may sound less plausible. In addition, liars may be reluctant to add more information out of fear that it will provide leads to investigators and, consequently, give their lies away. However, it is far from certain that eye closure will aid lie detection when liars have to fabricate their activities. Eye closure reduces cognitive load which should make it easier to lie. Future research could examine whether eye closure benefits lie detection when liars have to fabricate their answers.

It is also important to note that we restricted the eye closure procedure to the cued recall phase in the present experiment. Providing information to an interviewer when one's eyes are closed requires trust in the interviewer and we used the initial free recall phase for such trust to develop. Alternatively, we could have introduced trust building activities prior to the interview and could have introduced the eye closure manipulation before the initial free recall phase. Whether eye closure would have a differential effect on truth tellers and liars if it would be introduced before the initial free recall phase is a topic for future research.

Two findings merit further explanation. First, in the free recall part of the interview liars reported less detail than truth tellers but the difference was no longer significant in the follow-up part of the interview. The findings clearly show that the free recall part of the interview discriminated better between truth tellers and liars than the follow up part of the

interview. It seems that the initial reaction of liars was to avoid providing too much detail but that they changed their strategy during the follow up part of the interview and became more willing to convey detail. Perhaps they started to realise in the follow up part that mentioning these activities would not be harmful after all. Or perhaps because they were asked more specific questions in the cued recall phase they had to regulate their strategy by adding more detail to avoid looking suspicious. Whether the reluctance to provide detail is particularly an initial reaction amongst liars deserves further investigation. Alternatively, rather than a motivational difference to recall information, the findings could be explained through a memory difference between truth tellers and liars. During the mission, liars may have engaged in more constrained, local processing of details related to the task, whereas truth tellers may have engaged in more global processing. This would mean that liars had weaker memory traces for peripheral, environmental details than truth tellers and that liars were more dependent on external memory cues to activate such details in memory, cues which were provided in the cued recall phase but not in the free recall phase. Finally, the more specific cued recall questions restricted the range of possible detail participants could give, and perhaps hampered truth tellers' ability to report many detail. All three explanations, however, lead to the same prediction: Differences between truth tellers and liars are more likely to occur during an initial free recall than during a cued recall.

Two, we introduced two dependent variables 'detail' and 'observable evidence', and did so for applied reasons. An undercover officer who shadows a suspect in real life can make notes of the suspects' activities and pass these on to an interviewer. In a subsequent interview, the interviewer can compare these noted activities (e.g., evidence) with the suspect's report which gives an indication of completeness and correctness of the suspect's recall. Interestingly, in this experiment the 'observable evidence' variable was a stronger indicator of deceit than the 'detail' variable. We can only speculate why this result emerged.

As we mentioned in the Introduction, liars are particularly motivated to avoid reporting incriminating information. Perhaps the liars perceived some of the pieces of information that were part of the observable evidence variable, such as meeting people or making phone calls, particularly incriminating, and subsequently avoided mentioning them. Future research should examine participants beliefs about the nature of incriminating information.

In summary, the finding that truth tellers and liars differ from each other in reporting their activities even when liars can be entirely truthful about these activities is useful information for practitioners. It has been argued that lie detection may be problematic if truth tellers and liars carry out identical activities but our results showed that lie detection is possible in such situations, as liars are less forthcoming in reporting such activities. However, as this is the first study that we are aware of in which truth tellers and liars carried out the same activities, using only one scenario with quite specific tasks, more research is needed. In particular, the notion that this difference emerges in the initial account of the activities deserves further exploration.

Acknowledgements

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Table 1. The Participants' Responses in the Free Recall as a Function of Veracity

	Truth		Lie					Veracity Classification	
	M	*SD*	*M*	*SD*	F(1, 86)	*P*	*d*	Truth	Lie
Observable evidence (0-6)	2.34	1.74	.86	.95	24.42	<.0001	1.10	68%	77%
Number of Detail	72.57	51.65	41.80	43.31	9.17	.003	.62	48%	77%

Table 2. The Participants' Responses in the Cued Recall as a Function of Veracity

	Truth		Lie					Veracity Classification	
	M	*SD*	*M*	*SD*	F(1, 84)	*p*	*d*	Truth	Lie
Observable evidence (0-6)	3.29	1.37	2.14	1.00	20.07	<.0001	.97	71%	64%
Number of Detail	238.20	106.93	241.23	273.03	.00	.984	.01	57%	16%

Table 3. Questionnaire Data as a Function of Veracity

	Truth		Lie				
	M	*SD*	*M*	*SD*	F(1, 84)	*p*	*d*
Remembered detail not discussed in the interview	3.27	2.12	4.30	1.81	6.90	.010	.52
Did not report because thought they would sound suspicious	1.98	1.68	3.63	2.09	16.79	<.0001	.87
Did not report because I thought they were not important enough to recall	2.77	1.74	4.03	1.90	10.77	.002	.69

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[1] We also carried out three separate analyses of covariance with 'observable evidence' and 'detail' as dependent variables in which we included the Free Recall Phase 'observable evidence' and 'detail' scores as covariates. The covariates had no effect on the outcomes and the pattern of Results did not differ from the pattern reported in the main text.

[2] The Ms and SDs for the four cells were as follows. Regarding number of detail: Truth tellers, eyes open: $M = 229.77$, $SD = 109.78$; Liars, eyes open: $M = 160.20$, $SD = 52.65$; Truth tellers, eyes closed: $M = 247.44$, $SD = 105.61$; Liars, eyes closed: $M = 315.22$, $SD = 362.20$. The high mean score in the Liars, eyes closed condition was due to an outlier who provided 1894 details. When we excluded that participant the average mean score in the Liars, eyes closed condition was $M = 243.46$, $SD = 115.55$. Importantly, when we re-analysed our data without this outlier, the same pattern of results emerged as described in the main text. The Eye Closure effect was significant, $F(1, 86) = 5.07$, $p = .27$, $d = .47$, whereas the Veracity main effect, $F(1, 86) = 3.25$, $p = .075$, $d = .37$, and the Veracity X Eye Closure interaction effect, $F(1, 86) = 2.61$, $p = .11$, $eta^2 = .03$, were not significant.

Regarding observable evidence: Truth tellers, eyes open: $M = 3.26$, $SD = 1.54$; Liars, eyes open: $M = 2.00$, $SD = .95$; Truth tellers, eyes closed: $M = 3.31$, $SD = 1.19$; Liars, eyes closed: $M = 2.26$, $SD = 1.05$.