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COMBINING THE MODEL STATEMENT AND SKETCHING  
**Combining the Model Statement and the Sketching While Narrating Interview Techniques  
to Elicit Information and Detect Lies in Multiple Interviews**

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**Abstract**

The current experiment examined the effects of combining two interview techniques on information elicitation and lie detection in multiple interviews. Participants were interviewed online over three weeks. Two-thirds of the participants ( $n = 114$ ) were presented with the Model Statement interview technique in Interview 1 and were asked to sketch and narrate in Interview 2 (MS-Sketch condition) or vice versa (Sketch-MS condition). In Interview 3, participants provided a free recall. The remaining one-third of participants ( $n = 61$ ) provided only a free recall in the three interviews. Truth tellers reported more information than lie tellers in all three interviews. In Interview 2, the Sketch-MS condition elicited more new information and cues to deceit than the other conditions. The results imply that veracity effects are consistent across multiple interviews and the Model Statement is effective for eliciting information and cues to deceit when preceded by an initial recall.

*Keywords:* lie detection, deception, multiple interviews, repeated interviews, Model Statement, sketching

**Combining the Model Statement and the Sketching While Narrating Interview Techniques to Elicit Information and Detect Lies in Multiple Interviews**

Recently, researchers started advocating the use of combined verbal lie detection techniques to elicit more verbal cues to deceit in investigative interviews (Vrij, Mann, et al., 2021). These techniques involve proactive interviewing to elicit differences between truth tellers and lie tellers (Hartwig & Bond, 2011). The aim of these interviews is to either enhance truth tellers' memory, increase differences in cognitive load between truth tellers and lie tellers, or encourage interviewees to talk more (for reviews of these techniques, see Mac Giolla & Luke, 2021; Vrij, Fisher, et al., 2017). These techniques were generally tested in single interviews, but in real life, suspects are often interviewed multiple times. The current experiment examined how the combination of two interview techniques, the Model Statement and the sketching while narrating interview techniques, affects lie detection and information elicitation when they are employed across multiple interviews.

**The Model Statement Interview Technique**

In a Model Statement (MS) interview, interviewees are exposed to the MS (an example of a detailed account of an event irrelevant to the event under investigation; Vrij, Leal, & Fisher, 2018) and prompted to provide an account similar in detail to the MS. The MS results in more details than an instruction to provide a free recall without a MS (Leal et al., 2015), because the MS is an example and examples may be easier to follow than instructions (Vrij, Leal, & Fisher, 2018). Both truth tellers and lie tellers tend to add information after being exposed to the MS, but the type of information they provide differs. After exposure to the MS, truth tellers are more likely than lie tellers to provide details that make the event more complex (i.e., complications;

Vrij, Leal, et al., 2017, 2020), can be verified (Harvey, Vrij, Leal, Lafferty, & Nahari, 2017), and are central to the event (Leal et al., 2018).

To our knowledge, there is only one experiment that examined the effects of the MS across multiple interviews (Deeb et al., 2020). In that experiment, participants were interviewed three times—each interview one week apart—about a memorable event they had experienced in the past two years. Participants listened to the MS either in the first interview, second interview, first and second interviews, or not at all (control). Two main findings emerged in the third interview. First, positive effects (eliciting information and cues to deceit) of the MS did not carry over to subsequent interviews and second, introducing the MS twice did not result in more positive effects than introducing the MS only once.

### **The Sketching While Narrating Interview Technique**

Asking interviewees to sketch and narrate (i.e., interviewees verbally describe what they are sketching) has been shown to elicit information and cues to deceit (Dando et al., 2009; Vrij, Mann, et al., 2020). Sketching facilitates truth tellers' memory because it reinstates the context (Fisher & Geiselman, 1992). Sketching encourages truth tellers to put more effort in retrieval, and that assists in the activation of relevant memory traces which in turn activates other relevant memory traces (Collins & Loftus, 1975). Further, sketches aid retrieval of visual experiences because the output format (visual) is compatible with how the visual event was originally encoded (Schacter & Badgaiyan, 2001). Finally, sketching encourages truth tellers to report spatial information because each person or object they describe needs to be described in a specific location (Vrij, Mann, et al., 2012). All these features make sketching a good mnemonic tool for truth tellers as it enhances their recall of the target event.

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Sketching does not aid lie tellers as much as truth tellers, because lie tellers' memory trace for the reported event is not as rich as that of truth tellers, even when lie tellers tell embedded lies (i.e., partial truths) or prepare their lies in advance (Vrij et al., 2009, 2010). Lie tellers may also be unwilling to provide much information as it may give their lies away (Granhag et al., 2009; Strömwall & Willén, 2011). For example, a lie telling suspect may not want to sketch an object in a wrong location, because the investigator may eventually check that object and know that the suspect was lying, so the suspect may prefer not to refer to the object at all.

Previous research has shown that sketching while narrating in a single interview elicited more information among truth tellers than lie tellers, and this effect was larger than that for a free recall (Vrij, Leal, Fisher, Mann, et al., 2018; Vrij, Mann, et al., 2021). In an experiment that tested sketching while narrating in multiple interviews, participants were interviewed three times—each interview one week apart (Deeb, Vrij, Leal, & Burkhardt, 2021). The findings were similar to the MS findings discussed above. Positive effects (eliciting information and cues to deceit) of the sketching technique did not carry over to subsequent interviews and introducing the sketching technique twice did not result in more positive effects than introducing it only once.

For the MS and the sketching while narrating interview techniques to elicit more verbal cues to deceit and more information in multiple interviews, it may be beneficial to combine them. They may work effectively in combination, because the MS is primarily a tool that raises expectations whereas sketching is primarily a memory enhancement tool. The MS may make interviewees aware that they are expected to say more but what information to add may be restricted by a weak memory trace. The request to sketch, on the other hand, may enhance

interviewees' memory trace but interviewees may not add all they remember due to the incorrect expectations of how much they should say. Thus, the combination of both techniques may raise expectations and enhance memory, particularly among truth tellers, because lie tellers would be unable or unwilling to provide as many details.

### **Verbal Cues to Deceit**

The MS and the sketching while narrating interview techniques elicit various types of details. Both techniques increase reported complications among truth tellers more than lie tellers (Deeb, Vrij, Leal, & Burkhardt, 2021; Vrij, Leal, & Fisher, 2018). An example of a complication is, "I had to wait a bit because there was a crowd of people, and I did not want them to see me". As truth tellers have genuinely experienced the reported event, they are likely to add complications in their statement. For lie tellers, adding complications makes the account more complex and goes against their strategy of keeping their accounts simple (Hartwig et al., 2007), so they often avoid providing complications (Vrij & Vrij, 2020).

Common knowledge details and self-handicapping strategies have also differentiated truth tellers and lie tellers in previous experiments that tested the MS and the sketching while narrating interview techniques (e.g., Deeb et al., 2020; Vrij, Mann, et al., 2021). An example of a common knowledge detail is, "It was a boat - one of the boats that you usually find on the seashore", and of a self-handicapping strategy, "I'm old and I have a terribly forgetful memory". Lie tellers tend to provide more common knowledge details and self-handicapping strategies than truth tellers (Masip et al., 2016; Vrij, Leal, et al., 2020). Lie tellers who have not experienced an event tend to report information derived from general knowledge (Alison et al., 2014; Vrij, Leal, Jupe, et al., 2018). Reporting common knowledge details is also an effective method to keep an account simple. Lie tellers also tend to withhold information (Luke et al., 2014; Moston et al.,

1992) and to justify why they cannot provide that information by reporting self-handicapping strategies. In contrast, truth tellers are more willing to be forthcoming and to provide as much specific information as they can about the event under investigation (Granhag & Hartwig, 2008; Hartwig et al., 2010), which ultimately enhances veracity differences on common knowledge details and self-handicapping strategies.

Other details that have also been shown to differentiate truth tellers from lie tellers—including in interviews that employed the MS or sketching while narrating interview techniques—are person, location, action, temporal, and object (PLATO) details (Harvey, Vrij, Leal, Hope, & Mann, 2017; Nahari et al., 2012; Vrij, Mann, et al., 2012; Warmelink et al., 2013). These details have been examined extensively in eyewitness research (e.g., Eastwood et al. 2018; Kontogianni et al., 2018), but more research is needed on these cues in deception research. For example, experiments that tested sketching a past experience showed that PLATO details emerged more among truth tellers than lie tellers (Deeb, Vrij, Leal, Fallon, et al., 2021; Izotovas et al., 2020; Vrij et al., 2010), whereas an experiment that used the MS tool to elicit veracity differences about future activities (intentions) found the opposite results (Kleinberg et al., 2018). These contradictory findings may have resulted from differences in interview techniques (sketching versus MS) or in context (past events versus intentions). Therefore, it is important to understand the interview techniques and contexts that elicit PLATO details. For example, in real life interviews, investigators may want to elicit specific information (e.g., person details) about the event under investigation. Empirical evidence that guides them to the specific interview techniques and contexts that elicit person details may aid them with their investigations.

### **The Current Experiment**

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In the current experiment, we examined whether combining the MS and the sketching while narrating interview techniques elicits information and enhances lie detection across three interviews. Participants either (a) listened to the MS in Interview 1, sketched and narrated in Interview 2 (MS-Sketch condition), and provided a free recall in Interview 3; (b) sketched and narrated in Interview 1, listened to the MS in Interview 2, and provided a free recall in Interview 3 (Sketch-MS condition); or (c) provided a free recall in all three interviews (control condition). As we were interested in multiple interviews, we wanted to examine the potential effects of the MS and the sketching manipulation on the third interview. Thus, we decided to include the manipulations in the first two interviews and a free recall in the third interview. A similar design has been employed in previous deception research on multiple interviews (Deeb et al., 2020; Deeb, Vrij, Leal, & Burkhardt, 2021). Accordingly, we made predictions for details elicited in Interview 3 and unique details elicited across the three interviews (i.e., details in Interview 1 + new details in Interview 2 + new details in Interview 3). The hypotheses were registered on OSF (<https://osf.io/48gzj>).

Hypothesis 1, Veracity main effect: In Interview 3 and across interviews, truth tellers will provide more total details, PLATO (person, location, action, time, object) details, and complications and fewer common knowledge details and self-handicapping strategies than lie tellers.

Hypothesis 2, Modality main effect: In Interview 3 and across interviews, the combined effects of the MS and the sketching while narrating techniques will elicit more total details, PLATO details, complications, common knowledge details, and self-handicapping strategies than the control condition.



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Hypothesis 3, Veracity  $\times$  Modality interaction effect: In Interview 3 and across interviews, truth tellers will provide more total details, PLATO details, and complications and fewer common knowledge details and self-handicapping strategies than lie tellers, particularly in the combined interview techniques conditions.

We explored the differential effects of the MS-Sketch and the Sketch-MS conditions on the dependent variables.

### Method

#### Participants

A G\*Power analysis revealed that at least 182 participants were required for the experiment to have high statistical power (.97) and a medium to large effect size ( $f^2 = .09$ ). Therefore, we recruited a total of 186 participants to obtain equal-sized cells. However, a total of 11 participants did not follow instructions, so they were removed from the sample. The final sample included 175 participants ( $M_{\text{age}} = 25.04$ ,  $SD_{\text{age}} = 8.67$ ) of which 121 were females, 52 were males, one was non-binary, and another preferred not to say. Approximately half (53%) of the participants were British, and the remaining participants were European (18%), Asian (10%), African (5%), Hispanic (1%), of mixed ethnicity (7%), or of other background (6%).

Participants either were recruited via the departmental database and the university's social media platforms. They received £30 or two course credits. Ethics approval was granted by the faculty's ethics committee at the University of Portsmouth. All the followed procedures conformed with the principles of the Declaration of Helsinki.

#### Design

The experiment followed a 2 (Veracity: truth, lie)  $\times$  3 (Modality: MS-Sketch, Sketch-MS, control) between-subjects design. Among truth tellers ( $n = 93$ ), 30 were in the MS-Sketch, 33 in

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the Sketch-MS, and 30 in the control conditions. Among lie tellers ( $n = 82$ ), 26 were in the MS-Sketch, 25 in the Sketch-MS, and 31 in the control conditions.

The dependent variables were total details, PLATO (person, location, action, time, object) details, complications, common knowledge details and self-handicapping strategies.

### **Procedure**

The experiment was completed online. At the beginning of the first session, and after participants signed the consent forms via Qualtrics, they were randomly assigned to the truth or lie condition. The experimenter sent them a link (via Qualtrics) that included the instructions, a link to a 19-min video footage, and the pre-interview questionnaire. The video footage involved a secret agent completing a mission that started with her receiving a phone call to meet an Agent 1 in a car to get more instructions on the mission. After meeting Agent 1 and receiving the instructions, she went to a lake area to collect a package (a coffee cup with supposedly genetic sequencing code for synthetic Ebola) from Agent 2. Then, she dropped off the package in another location.

Participants were instructed that they will be interviewed about the footage. After viewing the footage, truth tellers were asked to be truthful about the mission as the interviewer was a friendly agent, whereas lie tellers needed to lie about the mission and the agents to protect the agent from the interviewer who was described as a hostile agent. Participants were informed that they should be convincing during the interview to win one of three prizes worth £50, £75 and £150. If they do not appear convincing, they would have to write a statement about the footage and would not be entered into the draw. In reality, none of the participants was asked to write a statement and all were entered into the draw. Participants were given as much time as they needed to prepare for the interview. When ready, participants completed the pre-interview

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questionnaire in which they rated on 7-point scales how motivated they were to perform well on the task (1= *not motivated at all* to 7 = *very motivated*), and how thorough (1 = *shallow* to 7 = *thorough*), sufficient (1 = *insufficient* to 7= *sufficient*), and good (1 = *poor* to 7 = *good*) were their preparations. Participants were then asked about the strategies they used to appear convincing. Lastly, participants completed their demographic details.

Participants then accessed the Zoom link for the interview. The interviewer was one of three female research assistants who was blind to the study hypotheses and participants' veracity condition. The same interviewer interviewed each participant in the three sessions. Participants were asked either (a) to verbally recall the witnessed mission (free recall), (b) to provide a sketch of the mission while narrating, or (c) to verbally recall the mission after listening to the MS. Participants listened to the MS used by Leal et al. (2015) which was an audiotope about a man describing a Formula 2 motor race he attended. Participants who sketched were asked by the interviewer at the end of the interview to show the sketch on screen so that she can take a photo of it. They were not told prior to or during the interview that they will be asked to show the sketch to the interviewer at the end of the interview.

Participants were given an appointment after one week for the second session and after two weeks for the third session. In the two follow up sessions, participants were reminded of their veracity condition and that they had to be convincing. At the beginning of the second and third sessions they were given time to prepare, and then completed a pre-interview questionnaire with the same questions concerning their motivation, preparations, and strategies as in the first session. The internal reliability for the preparation variables (the extent to which participants' preparations were thorough, sufficient and good) was .94 across questionnaires, so we calculated an average score for these variables (preparation average score) for the analysis. The interview

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technique in the second session depended on the participants' assigned condition (free recall, sketching while narrating, or MS). In the third session, all participants provided just a free recall. At the end of the third session, participants were sent a link to a post-interview questionnaire in which they rated on 7-point scales (1 = *not at all* to 7 = *very much*) the extent to which they (a) were motivated to perform well in the three interviews, (b) thought the interviewer believed them, (c) believed they will have to write a statement, (d) believed they will win a prize, and (e) limited themselves to discussing core details without elaboration so that the three interviews do not become too long. Participants also rated on an 11-point percentage scale the extent to which they were truthful. Participants in the Sketch-MS and MS-Sketch conditions were asked to rate to what extent they thought the MS and sketching while narrating were anticipated (1 = *not at all* to 7 = *very much*), made the interview easy (1 = *very difficult* to 7 = *very easy*), and helped with what to say (1 = *did not help at all with what to say* to 7 = *helped very much with what to say*). After they completed the questionnaire, participants were debriefed and rewarded. All participants were told that they were believed in the interviews and that their names were entered in the prize draw.

### Coding

All verbal interviews were transcribed and coded separately for each session. The sketches were not coded, because previous research has shown that sketches made while narrating guide interviewees' verbal reports rather than act as stand-alone lie detection tools (see Vrij, Mann, et al., 2020). Details were coded as person, location, action, temporal, or object (PLATO) details. Person details involved the mention and physical descriptions of persons (e.g., "There was a blonde woman with glasses, and she was wearing a blue top" includes five person details). Location details referred to directions and to static places and their descriptions such as

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street names and buildings (e.g., “She started on the left side of Cornwall Street” includes five location details). Action details were verbs such as walked, entered, turned, passed, etc.

Temporal details denoted time such as then, afterwards, Summer, afternoon, etc. Object details referred to non-static objects such as cars, stones, and their descriptions (e.g., “He gave her the package in a coffee cup” includes three object details).

Any PLATO details that were repeated were coded only once unless they were mentioned in a different context (see Leal et al., 2018, for a similar coding scheme). For example, a participant mentioned encountering a family en route to Agent 1 and another family en route to Agent 2. Although ‘family’ was a repeated detail, it did not refer to the same family (or context) and was thus coded twice. In Interviews 2 and 3, new PLATO details (i.e., PLATO details not mentioned during Interviews 1 and 2 respectively) were marked. We also computed the scores for unique PLATO details (i.e., PLATO details in Interview 1 + new PLATO details in Interview 2 + new PLATO details in Interview 3).

The first author and a second coder—both blind to participants’ veracity and modality conditions—coded the transcripts independently for PLATO details. The second coder was trained and given practice transcripts to code. Feedback was provided for each coded transcript until the coder was able to code independently. The first author coded all the transcripts, and the second coder coded 40 transcripts. Inter-rater reliability was measured with the Intra-Class Correlation (ICC) coefficient (single measures scores). Hallgren (2012) reported that inter-rater reliability is poor for ICC values less than .40, fair for values between .40 and .59, good for values between .60 and .74, and excellent for values between .75 and 1. Inter-rater reliability for unique PLATO details was excellent, ICC = .96.

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The second and third authors—both blind to participants’ veracity and modality conditions—coded the transcripts for complications, common knowledge details, and self-handicapping strategies. Examples of complications are, “She was trying to avoid people” and “He did not seem to realise that she was there”. An example of a common knowledge detail is, “It was a busy Saturday afternoon in the park”. A self-handicapping strategy example is, “Three weeks have passed so I can barely remember what happened”. One of the coders coded all the transcripts and the other coder coded 63 transcripts. We calculated unique scores for complications, common knowledge details, and self-handicapping strategies. For example, the unique complications score was the sum of all complications in Interview 1, new complications in Interview 2, and new complications in Interview 3. Inter-rater reliability was excellent for complications (ICC = .89) and self-handicapping strategies (ICC = .77), and good for common knowledge details (ICC = .71).

While coding, we noticed many contradictions in the transcripts. Contradictions are typically not coded in experimental research, because they rarely occur when an interviewee describes an alleged experience only once (the default setting in experimental research). However, contradictions are assumed to be revealing about deception (Strömwall & Granhag, 2007; Vrij, Leal, et al., 2012), so we decided to code contradictions in Interview 2 and new contradictions in Interview 3. The first author coded all the transcripts, and the second coder who coded PLATO details also coded 40 transcripts for contradictions. Inter-rater reliability for contradictions was excellent in Interview 2 (ICC = .82) and good in Interview 3 (ICC = .74).

Similar to previous research, we also coded incorrect PLATO details mentioned by truth tellers to understand if truth tellers show trade-offs between the accuracy and the quantity of information provided over time (Harvey, Vrij, Leal, Hope, et al., 2017; Leal et al., 2021). The

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first author coded incorrect details for all truth tellers' transcripts, and a second coder coded 39 transcripts. Inter-rater reliability for incorrect PLATO details was excellent in Interview 1 (ICC = .96), Interview 2 (ICC = .88), and Interview 3 (ICC = .95).

Participants' strategies to appear convincing as reported in the pre-interview questionnaire were coded by the first author. Categories were formulated based on participants' responses. Similar responses were grouped together in a single category, and each category was labelled to describe one strategy (see Table 1 in the Appendix). When the same response could fit in more than one category, it was allocated to those corresponding categories. To measure inter-rater reliability, a second coder coded all participants' responses based on the corresponding categories generated by the first author. Inter-rater agreement was substantial, Cohen's  $\kappa = .80$ .

### Results

The results from the pre-interview and post-interview questionnaires can be found in the Appendix. In summary, lie tellers were more likely than truth tellers to prepare, be deceptive, believe they will have to write a statement, and provide shorter responses, and less likely to think the interviewer believed them.

The Appendix also includes the analyses of incorrect details and contradictions. Truth tellers barely reported any incorrect details, and lie tellers reported more contradictions than truth tellers.

### Hypotheses Testing

#### *Interview 3 Details*

A 2 (Veracity: lie teller, truth teller)  $\times$  3 (Modality: MS-Sketch, Sketch-MS, control) MANOVA with total details, PLATO details, complications, common knowledge details, and

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self-handicapping strategies in Interview 3 as dependent variables, revealed a significant multivariate main effect of Veracity, Pillai's Trace = .45,  $F(8, 162) = 16.28$ ,  $p < .001$ ,  $\eta^2 = .45$ . No significant effects emerged for Modality, Pillai's Trace = .08,  $F(16, 326) = 0.89$ ,  $p = .587$ ,  $\eta^2 = .04$ , or for Veracity  $\times$  Modality, Pillai's Trace = .07,  $F(16, 326) = 0.69$ ,  $p = .809$ ,  $\eta^2 = .03$ . The Veracity effects revealed that in Interview 3 (see Table 1), truth tellers reported more total and PLATO details and more complications than lie tellers.

To corroborate our (frequentist) results, we carried out Bayesian analyses of variance that test the likelihood of the data under both the null hypothesis (H0) and the alternative hypothesis (H1). Bayes factors ( $BF_{10}$ ) 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  $BF_{10}$  is  $BF_{01}$  ( $1/BF_{10}$ ) which is the likelihood of supporting evidence for the null hypothesis (H0) compared to the alternative hypothesis (H1). We report  $BF_{10}$  statistics only as  $BF_{01}$  can be inferred by inverting  $BF_{10}$ . As Table 1 shows, the Bayesian scores testing the alternative hypothesis revealed very strong evidence for total and PLATO details and complications, but weak evidence for common knowledge details and self-handicapping strategies, supporting the frequentist analysis.

### ***Unique Details Across the Three Interviews***

We report the results of unique details in the Appendix as they were almost similar to the Interview 3 findings. Overall, Hypothesis 1 that predicted a Veracity main effect for Interview 3 and unique details was supported for total details, PLATO details, and complications. The Veracity effect on common knowledge details was also supported but only when unique



common knowledge details were examined across the three interviews. Hypotheses 2 and 3 that predicted Modality main effects and Veracity  $\times$  Modality interaction effects for Interview 3 and for unique details were not supported.

### Exploratory Analyses

#### *New Details in Interview 2*

One of the major advantages of the MS and the sketching while narrating interview techniques is the elicitation of new information (Deeb et al., 2020; Vrij, Leal, Fisher, Mann, et al., 2018). Therefore, we explored if combining these two techniques elicited new details in Interview 2 (similar to Deeb et al., 2020). We ran a 2 (Veracity: lie teller, truth teller)  $\times$  3 (Modality: MS-Sketch, Sketch-MS, control) MANOVA with new total details, new PLATO details, new complications, new common knowledge details, and new self-handicapping strategies in Interview 2 as dependent variables. Significant multivariate effects emerged for Veracity, Pillai's Trace = .24,  $F(8, 162) = 6.30, p < .001, \eta^2 = .24$ , Modality, Pillai's Trace = .21,  $F(16, 326) = 2.33, p = .003, \eta^2 = .10$ , and Veracity  $\times$  Modality, Pillai's Trace = .17,  $F(16, 326) = 1.92, p = .018, \eta^2 = .09$ . As Table 2 shows, truth tellers provided more new total, location, action, temporal, and object details, and complications and fewer new common knowledge details than lie tellers.

The Modality main effect was significant for new total details,  $F(2, 169) = 5.77, p = .004, \eta^2 = .06, BF_{10} = 13.11$ , new location details,  $F(2, 169) = 6.85, p = .001, \eta^2 = .08, BF_{10} = 28.14$ , new action details,  $F(2, 169) = 4.09, p = .018, \eta^2 = .05, BF_{10} = 3.02$ , new complications,  $F(2, 169) = 5.56, p = .005, \eta^2 = .06, BF_{10} = 12.11$ , and new common knowledge details,  $F(2, 169) = 3.31, p = .039, \eta^2 = .04$ , but the Bayesian analyses did not support the differences for new common knowledge details ( $BF_{10} = 0.29$ ). The Sketch-MS condition elicited more new total,  $M$

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= 43.36,  $SD = 30.44$ , 95% CI [35.36, 51.37], location,  $M = 17.74$ ,  $SD = 14.83$ , 95% CI [13.84, 21.64], and action details,  $M = 10.95$ ,  $SD = 7.28$ , 95% CI [9.03, 12.86], than the control sketch condition ( $M = 27.61$ ,  $SD = 17.50$ , 95% CI [23.13, 32.09] for new total details;  $M = 9.34$ ,  $SD = 8.05$ , 95% CI [7.28, 11.41] for new location details;  $M = 7.59$ ,  $SD = 5.11$ , 95% CI [6.28, 8.90] for new action details. Further, the Sketch-MS condition,  $M = 2.03$ ,  $SD = 2.22$ , 95% CI [1.45, 2.62], elicited more new complications than the MS-Sketch condition,  $M = 0.93$ ,  $SD = 1.22$ , 95% CI [0.60, 1.26].

The Veracity  $\times$  Modality interaction effect was significant for new common knowledge details only,  $F(2, 169) = 7.08$ ,  $p = .001$ ,  $\eta^2 = .08$ . Simple effects revealed that the Sketch-MS condition elicited more new common knowledge details than the MS-Sketch and the control conditions among lie tellers but not among truth tellers (see Table 3 for the means).

### *Time 1 Data*

To understand if there are any carryover effects of modality from Interview 1, we ran a 2 (Veracity: lie teller, truth teller)  $\times$  3 (Modality: MS-Sketch, Sketch-MS, control) MANOVA with total details, PLATO details, complications, common knowledge details, and self-handicapping strategies in Interview 1 as dependent variables. A significant multivariate effect emerged for Veracity, Pillai's Trace = .41,  $F(8, 162) = 14.31$ ,  $p < .001$ ,  $\eta^2 = .41$ . The Modality effect, Pillai's Trace = .06,  $F(16, 326) = 0.65$ ,  $p = .840$ ,  $\eta^2 = .03$ , and the Veracity  $\times$  Modality effect, Pillai's Trace = .07,  $F(16, 326) = 0.77$ ,  $p = .720$ ,  $\eta^2 = .04$ , were not significant. As Table 4 shows, truth tellers provided more total details, PLATO details, and complications and fewer common knowledge details than lie tellers.

## Discussion

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The current experiment examined the effects of introducing the MS and the sketching while narrating interview techniques in the first two interviews on eliciting information and verbal cues to deception in the third interview and across interviews. Truth tellers reported more total, person, location, action, temporal, and object details and complications than lie tellers in the third interview and across interviews. Lie tellers reported more unique common knowledge details than truth tellers across interviews (but not in the third interview). The strong overlap between verbal cues in the third interview and across interviews implies that in real life cases, investigators who have access to only the statement from the third interview will not be at a disadvantage for detecting lies (for similar results, see Deeb et al., 2020; Deeb, Vrij, Leal, & Burkhardt, 2021).

The veracity effects were also strong in Interviews 1 and 2. Thus, the differences between lie tellers and truth tellers seem to carry over in multiple interviews, a finding that aligns with previous research (Deeb et al., 2020; Izotovas et al., 2020). Although lie tellers try to be consistent across interviews (refer to Table 1 in the Appendix; also see Granhag & Strömwall, 1999), whereas truth tellers show a natural memory decay with time (Fisher et al., 2013; Harvey, Vrij, Leal, Hope, et al., 2017), it is still possible to elicit cues to deceit after three weeks from the witnessed event. Our results replicate previous findings in which the tested verbal cues distinguished truth tellers and lie tellers who reported past events in single and multiple interviews (Deeb, Vrij, Leal, Fallon, et al., 2021; Vrij, Leal, Mann, et al., 2018). Thus, all these verbal cues—including PLATO details which were not extensively examined previously—seem promising for lie detection in multiple interviews. The veracity differences on verbal cues may be explained by the strategies reported in the post-interview questionnaire. Truth tellers mentioned that they attempted to be detailed whereas lie tellers—albeit reporting embedded lies

and preparing more than truth tellers—tended to keep their accounts simple, short, and consistent. Therefore, truth tellers and lie tellers differed on the strategies they used which in turn elicited different cues. These results replicate previous findings (Deeb et al., 2020; Verigin et al., 2020). Moreover, the differences between truth tellers and lie tellers did not seem to happen at the expense of truth tellers' memory as incorrect proportion scores for all variables were close to zero, meaning that most of the details reported by truth tellers were correctly recalled.

The weakest Veracity effects occurred for self-handicapping strategies and common knowledge details. Self-handicapping strategies did not distinguish truth tellers from lie tellers at all, possibly because they rarely occurred. Low frequency of occurrence of self-handicapping strategies have been found before (Vrij, Palena, et al., 2021). Common knowledge details emerged as a veracity indicator in Interviews 1 and 2 but not in Interview 3. Comparing the means of common knowledge details in Interviews 1 and 3 (Tables 1 and 5) shows that truth tellers provided the same number of common knowledge details in both interviews but lie tellers provided fewer common knowledge details in Interview 3 which may have diminished the effects of this cue as a veracity indicator. Further, the effect sizes for this cue in Interviews 1 and 2 were smaller than for the other cues that showed significant differences between truth tellers and lie tellers. Common knowledge details (and self-handicapping strategies) is a cue to deceit (lie tellers report them more than truth tellers), whereas all the detail cues are cues to truthfulness (truth tellers report them more than lie tellers). The finding that cues to truthfulness are more diagnostic than cues to deceit is common in verbal deception research (Nahari et al., 2019).

We found Modality main effects and Veracity x Modality interaction effects in Interview 2 but not in Interview 3 or across interviews. This shows that the effects of the MS and sketching while narrating interview techniques do not carry over to subsequent interviews, replicating the

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general finding obtained in the two previous experiments introducing these two interview techniques in multiple interviews (Deeb et al., 2020; Deeb, Vrij, Leal, & Burkhardt, 2021).

Practitioners should be aware of this and act upon the beneficial effects of the techniques in the interviews when they are introduced rather than wait until a later interview.

Interview 1 did not reveal any effects for the MS and sketching interview techniques. This interview stage represents a typical deception experiment in which interviewees are interviewed once after the alleged event occurred. In such experiments, the MS and sketching while narrating techniques typically did result in the elicitation of extra information and cues to deceit (Vrij, Leal, Jupe, et al., 2018; Vrij, Mann, et al., 2020). A possible explanation for the absence of a sketching effect is that participants were asked to report a sequence of actions similar to a film. This is more difficult to sketch than a static event similar to a photograph. All previous sketching deception experiments used static events. Perhaps the sketching instruction works better when interviewees are instructed to sketch a static event rather than a sequence of events, an empirical question worth examining.

The MS tool did not reveal effects in Interview 1 but did reveal effects in Interview 2. In Interview 1, interviewees were exposed to the MS prior to their initial recall. This is not the recommended method to use the MS technique (Vrij, Leal, & Fisher, 2018). The recommended method is to have an initial free recall followed by the MS followed by a second recall and to examine the new information provided in the second recall. This method is actually used when the Interview 2 responses are considered, because the Interview 1 can then be considered to be the initial recall. A MS gives interviewees the impression that they need to report more information than they initially thought they should give. Providing more information than

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initially planned is probably easier to do when an initial statement is given than when no statement is yet provided, because the initial statement then works like an anchor point.

The Sketch-MS modality elicited more new total, location, and action details than the control condition and more new complications than the MS-Sketch condition in Interview 2. The MS has been shown to enhance information elicitation (e.g., total details, complications, common knowledge details) when presented in a second interview (Deeb et al., 2020), and our results replicate those findings. We think it is most likely that the effect is caused by the MS rather than by the combined effects of sketching while narrating in Interview 1 followed by a MS in Interview 2, because of the absence of a sketching effect in Interview 1.

In addition, we found that the Sketch-MS condition elicited more new common knowledge details than the MS-Sketch and the control conditions in Interview 2 but only among lie tellers. In other words, new common knowledge details emerged as a cue to deceit in response to the introduced interview techniques. It may not be surprising that an interaction effect only occurred for this cue. As we mentioned earlier, self-handicapping strategies hardly occurred which makes it difficult for interview techniques to elicit veracity differences (i.e., floor effect). All details cues resulted in large differences between truth tellers and lie tellers, which makes it difficult for interview techniques to further enhance these differences (i.e., ceiling effect). As common knowledge details significantly differentiated truth tellers and lie tellers in Interview 1 but showed the lowest effect size compared to other cues (thus having no ceiling or floor effects), it may have been possible for lie tellers to provide new common knowledge details in Interview 2 after a MS was introduced.

Contradictions were typically not examined in deception research because they rarely occurred in interviews. Yet when they did occur, contradictions have emerged as cues to deceit

in single (Leins et al., 2012; Vrij, Leal, et al., 2012) and multiple interviews (Masip et al., 2016).

In the current experiment, lie tellers produced more total, person, action, and object contradictions than truth tellers across interviews. Although many lie tellers contradicted themselves (87%), many truth tellers (62%) also contradicted themselves. As contradictions is one of the most popular cues practitioners rely upon when making veracity judgements (Deeb et al., 2018; Granhag et al., 2005; Vrij, 2008), this experiment shows the danger of considering contradictions as a cue to deceit because it wrongly accuses many truth tellers.

Previous research has shown that truth tellers and lie tellers rarely contradict themselves in multiple interviews (Granhag & Strömwall, 1999, 2002). However, in these experiments the footage stimuli was considerably shorter (five minutes on average) than in the current experiment (19 minutes on average). Perhaps, when the witnessed event is long, both truth tellers and lie tellers have to remember and provide more information which may increase the odds of providing contradictions. These odds may be larger for lie tellers who have to remember fabricated information. This speculation has implications for real life interviews where suspects and human sources discuss lengthy events that are typically longer than five minutes. Thus, more contradictions may be elicited in real life interviews than the deception literature suggests. Further research may shed light on this speculation.

### **Methodological Considerations**

The current experiment was conducted online and we cannot rule out a priori that online interviewing may result in different veracity effects than face-to-face interviewing. However, the results were almost similar to those found in face-to-face experiments that examined veracity effects in multiple interviews (Deeb et al., 2020; Deeb, Vrij, Leal, & Burkhardt, 2021). Also, previous research that compared online and face-to-face interviews showed minor differences

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between the two methods (Johnson et al., 2019, Meijer et al., 2021). Nonetheless, it is still possible that the online nature of the experiment may have affected the results, because the interviewer could not check if participants actually listened to the MS or what the participants were sketching during the interview. Therefore, participants may have thought less of the consequences of how they responded compared to face-to-face experiments. These are questions worth investigating further especially that recently, and due to the COVID-19 pandemic, police interviews are being conducted online (Crown Prosecution Service, 2021). Deception researchers have already started running online studies (e.g., Leal et al., 2021) to address this new interviewing mediums. Future studies may systematically test potential differences between online and face-to-face research in single and multiple interviews.

Examining other verbal cues to deceit than those tested in the current experiment may have yielded different results. One example is core (central) details and peripheral (non-central) details which have been examined in previous multiple interviews on memorable experiences (Deeb et al., 2020). These details could not be examined in the current experiment, because the video footage scenario makes it difficult for interviewees to include peripheral details. Therefore, should a different scenario have been used, combining interview techniques may have possibly elicited core details amongst truth tellers in particular. Future research may examine if core details are actually elicited along with the other detail types when the same or different scenario is used. Statements that are judged based on several cues may prompt more confident and accurate lie detection decisions than judgments of statements based on single cues. For example, the decision that a statement is truthful based on the number of total, PLATO, core, and common knowledge details and complications is more likely to be accurate than a decision based solely on the total number of details (see Luke, 2019).



## **Conclusions**

In summary, we found differences between truth tellers and lie tellers in the third interview and across interviews. The MS seemed to be particularly impactful for eliciting new information and cues to deceit when presented in the second interview—more specifically, the Sketch-MS condition had the largest effects on lie detection and information elicitation in Interview 2—but no carryover effects emerged beyond that interview. These results imply that the MS is successful when presented after an initial interview. Thus, it is important to further investigate how to properly employ interview techniques in multiple interviews to maximise their efficacy.

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COMBINING THE MODEL STATEMENT AND SKETCHING

**Table 1**

*Descriptive and Inferential Statistics for Details in Interview 3 as a Function of Veracity*

Detail	Truth tellers <i>n</i> = 93		Lie tellers <i>n</i> = 82		<i>F</i>	<i>p</i>	<i>d</i> [95% CI]	BF <sub>10</sub>
	<i>M</i> ( <i>SD</i> )	95% CI	<i>M</i> ( <i>SD</i> )	95% CI				
Total	153.45 (61.80)	140.72, 166.18	80.82 (40.84)	71.84, 89.79	78.87	<.001	1.39 [1.05, 1.72]	1.547 × 10 <sup>13</sup>
Person	15.29 (06.94)	13.86, 16.72	10.43 (05.21)	09.28, 11.57	25.52	<.001	0.79 [0.48, 1.10]	22846.46
Location	51.28 (26.44)	45.83, 56.72	23.95 (15.08)	20.64, 27.27	65.98	<.001	1.27 [0.94, 1.60]	1.451 × 10 <sup>11</sup>
Action	43.03 (15.59)	39.82, 46.24	23.78 (12.78)	20.97, 26.59	75.66	<.001	1.35 [1.02, 1.68]	5.247 × 10 <sup>12</sup>
Temporal	19.49 (09.95)	17.45, 21.54	09.49 (06.19)	08.13, 10.85	60.18	<.001	1.21 [0.88, 1.53]	1.622 × 10 <sup>10</sup>
Object	24.35 (09.94)	22.31, 26.40	13.17 (07.63)	11.49, 14.85	66.21	<.001	1.26 [0.93, 1.59]	1.588 × 10 <sup>11</sup>
Complications	07.31 (04.30)	06.43, 08.20	01.99 (02.20)	01.51, 02.47	100.18	<.001	1.56 [1.22, 1.90]	1.062 × 10 <sup>16</sup>
CKD	00.23 (01.00)	00.02, 00.43	00.45 (00.92)	00.25, 00.65	02.16	.143	0.23 [-0.07, 0.53]	0.49
SHS	00.03 (00.18)	-0.00, 00.07	00.04 (00.19)	-0.00, 00.08	00.06	.812	0.05 [-0.24, 0.35]	0.17

Note. CI = Confidence interval; CKD = Common knowledge details; SHS = Self-handicapping strategies.

COMBINING THE MODEL STATEMENT AND SKETCHING

**Table 2**

*Descriptive and Inferential Statistics for New Details in Interview 2 as a Function of Veracity*

Detail	Truth tellers <i>n</i> = 93		Lie tellers <i>n</i> = 82		<i>F</i>	<i>p</i>	<i>d</i> [95% CI]	BF <sub>10</sub>
	<i>M</i> ( <i>SD</i> )	95% CI	<i>M</i> ( <i>SD</i> )	95% CI				
Total	41.66 (26.43)	36.21, 47.10	27.29 (20.82)	22.72, 31.87	14.92	<.001	0.60 [0.30, 0.91]	188.88
Person	03.14 (02.77)	02.57, 03.71	03.33 (03.19)	02.63, 04.03	00.26	.609	-0.06 [-0.36, 0.24]	0.18
Location	17.09 (13.84)	14.24, 19.94	09.65 (09.38)	07.59, 11.71	16.42	<.001	0.63 [0.32, 0.94]	320.84
Action	10.31 (06.39)	09.00, 11.63	07.37 (06.19)	06.01, 08.73	08.65	.004	0.47 [0.16, 0.77]	12.68
Temporal	05.85 (04.81)	04.86, 06.84	03.50 (03.23)	02.79, 04.21	13.49	<.001	0.57 [0.27, 0.88]	92.57
Object	05.27 (04.07)	04.43, 06.11	03.45 (03.08)	02.77, 04.13	10.28	.002	0.50 [0.20, 0.81]	22.86
Complications	01.94 (01.96)	01.53, 02.34	00.90 (01.22)	00.63, 01.17	17.30	<.001	0.64 [0.33, 0.94]	331.41
CKD	00.04 (00.20)	00.00, 00.09	00.22 (00.54)	00.10, 00.34	09.93	.002	0.44 [0.14, 0.74]	7.72
SHS	00.03 (00.18)	-0.00, 00.07	00.07 (00.31)	00.01, 00.14	01.05	.308	0.16 [-0.14, 0.46]	0.29

Note. CI = Confidence interval; CKD = Common knowledge details; SHS = Self-handicapping strategies.

**Table 3***Descriptive Statistics for New Details in Interview 2 as a Function of Veracity and Modality*

Detail	Truth tellers			Lie tellers		
	Control <i>n</i> = 30	MS-Sketch <i>n</i> = 30	Sketch-MS <i>n</i> = 33	Control <i>n</i> = 31	MS-Sketch <i>n</i> = 26	Sketch-MS <i>n</i> = 25
Total	32.20 (17.34)	41.67 (24.79)	50.24 (31.92)	23.16 (16.74)	25.50 (18.23)	34.28 (26.28)
Person	03.03 (02.19)	02.60 (02.61)	03.73 (03.29)	03.10 (03.34)	03.04 (02.24)	03.92 (03.83)
Location	11.37 (09.37)	18.73 (14.20)	20.79 (15.52)	07.39 (06.05)	08.42 (07.21)	13.72 (13.08)
Action	09.10 (04.65)	09.33 (06.28)	12.30 (07.46)	06.13 (05.18)	07.12 (06.56)	09.16 (06.76)
Temporal	04.63 (03.93)	05.73 (04.29)	07.06 (05.73)	03.42 (03.33)	03.15 (02.80)	03.96 (03.58)
Object	04.07 (02.42)	05.27 (03.84)	06.36 (05.14)	03.13 (02.92)	03.77 (03.36)	03.52 (03.06)
Complications	01.80 (01.61)	01.13 (01.33)	02.79 (02.39)	00.97 (01.11)	00.69 (01.05)	01.04 (01.51)
CKD	00.00 (00.00)	0.13 (00.35)	00.00 (00.00)	00.13 (00.34)	00.08 (00.27)	00.48 (00.82)
SHS	00.07 (00.25)	00.03 (00.18)	00.00 (00.00)	00.10 (00.40)	00.04 (00.20)	00.08 (00.28)

Note. CKD = Common knowledge details; SHS = Self-handicapping strategies.

**Table 4***Descriptive and Inferential Statistics for Details in Interview 1 as a Function of Veracity*

Detail	Truth tellers <i>n</i> = 93		Lie tellers <i>n</i> = 82		<i>F</i>	<i>p</i>	<i>d</i> [95% CI]	BF <sub>10</sub>
	<i>M</i> ( <i>SD</i> )	95% CI	<i>M</i> ( <i>SD</i> )	95% CI				
Total	157.95 (67.59)	144.03, 171.87	90.26 (49.15)	79.46, 101.06	53.72	<.001	1.15 [0.82, 1.47]	1.995 × 10 <sup>9</sup>
Person	16.69 (08.50)	14.94, 18.44	11.96 (07.63)	10.29, 13.64	13.97	<.001	0.59 [0.28, 0.89]	131.69
Location	49.71 (26.46)	44.26, 55.16	24.90 (15.52)	21.49, 28.31	53.25	<.001	1.14 [0.82, 1.47]	1.491 × 10 <sup>9</sup>
Action	43.61 (17.44)	40.02, 47.21	26.62 (15.87)	23.13, 30.11	43.24	<.001	1.02 [0.70, 1.34]	3.088 × 10 <sup>7</sup>
Temporal	21.97 (11.27)	19.65, 24.29	12.18 (08.03)	10.42, 13.95	41.15	<.001	1.00 [0.68, 1.32]	1.263 × 10 <sup>7</sup>
Object	25.97 (09.97)	23.91, 28.02	14.59 (08.94)	12.62, 16.55	59.97	<.001	1.20 [0.88, 1.53]	2.053 × 10 <sup>10</sup>
Complications	07.47 (04.47)	06.55, 08.39	02.51 (02.96)	01.86, 03.16	70.06	<.001	1.31 [0.98, 1.64]	7.300 × 10 <sup>11</sup>
CKD	00.20 (00.46)	00.11, 00.30	00.67 (01.07)	00.44, 00.91	13.82	<.001	0.57 [0.27, 0.88]	127.27
SHS	00.04 (00.20)	00.00, 00.09	00.06 (00.24)	00.01, 00.11	00.34	.561	0.09 [-0.21, 0.39]	00.19

Note. CI = Confidence interval; CKD = Common knowledge details; SHS = Self-handicapping

## Appendix

### Pre-Interview Questionnaires

We conducted two mixed ANOVAs with Veracity (truth teller, lie teller) and Modality (MS-Sketch, Sketch-MS, control) as the between-subjects factors, Interview (Interview 1, Interview 2, Interview 3) as the within-subjects factor, and motivation and preparation average as dependent variables. Only the main effect of Interview on motivation was significant,  $F(1.98, 334.78) = 8.55, p < .001, \eta^2 = .05$ . Participants were more motivated in Interview 1 ( $M = 6.13, SD = 1.12, 95\% CI [5.96, 6.29]$ ) than in Interview 2 ( $M = 5.91, SD = 1.13, 95\% CI [5.74, 6.08]$ ) or in Interview 3 ( $M = 5.82, SD = 1.10, 95\% CI [5.66, 5.99]$ ). However, the motivation scores were high across the three interviews. No other significant effects emerged (all  $F$ 's  $< 2.99$ , all  $p$ 's  $> .051$ ). Participants generally thought that they were well-prepared ( $M = 4.79, SD = 1.35$ ).

We averaged the numbers of lie tellers and truth tellers who reported preparing a strategy. Significantly more lie tellers (64%) than truth tellers (46%) reported preparing a strategy across the three questionnaires, average  $\chi^2 = 5.99, p = .022$ . The strategies that truth tellers and lie tellers reported are shown in Table 1. Truth tellers were more likely to plan providing a detailed and truthful response, whereas lie tellers were more likely to aim to control their nonverbal behaviour (e.g., eye contact), to appear confident, to use notes and external resources (e.g., internet, practice with someone else), to report embedded lies (i.e., to report details from the original footage), to keep their account simple, and to remain consistent.

### Post-Interview Questionnaire

A 2 (Veracity: truth teller, lie teller)  $\times$  3 (Modality: MS-Sketch, Sketch-MS, control) MANOVA with the extent to which participants (a) were motivated to perform well on the three interviews, (b) thought the interviewer believed them, (c) believed they will have to write a

statement, and (d) believed they will win the prize as dependent variables, revealed a significant multivariate effect of Veracity, Pillai's Trace = .29,  $F(4, 166) = 17.21$ ,  $p < .001$ ,  $\eta^2 = .29$ . The Modality and the Veracity  $\times$  Modality effects were not significant (Pillai's Trace  $< .06$ ,  $ps > .385$ ). The Veracity main effects are shown in Table 2. Compared to lie tellers, truth tellers were significantly more likely to think they were believed by the interviewer and less likely to believe they will have to write a statement. Also, truth tellers and lie tellers were equally and highly motivated, and they did not significantly differ in their perceptions on the likelihood of winning a prize.

**Table 1**

*Frequency of Prepared Strategies as Reported in the Pre-interview Questionnaire*

What strategies did you prepare to appear convincing?	Pre-interview1		Pre-interview2		Pre-interview3	
	Truth tellers	Lie tellers	Truth tellers	Lie tellers	Truth tellers	Lie tellers
Provide a detailed response	23	8	19	6	22	4
Be truthful/Recall from memory	13	0	14	0	17	0
Control nonverbal behavior	9	11	4	13	5	6
Use notes and external resources	9	9	4	7	6	13
Admit forgetting	5	0	0	0	4	0
Appear confident and/or avoid hesitation	4	13	6	15	3	13
Look friendly and/or use humor	3	3	0	0	1	0
Act spontaneously	2	0	2	1	0	0
Report an embedded lie	0	23	0	18	0	15
Fabricate a complete lie	0	7	0	0	0	2
Keep the account simple	0	2	1	2	0	6
Remain consistent	0	2	0	11	5	22
Report events in chronological order	0	0	4	3	5	1
Fabricate new details	0	0	0	5	0	3
Act as if trying to remember	0	0	0	0	0	4
Omit information	0	0	0	0	0	2



**Table 2***Descriptive and Inferential Statistics for the Ratings in the Post-Interview Questionnaire*

Questionnaire item	Truth tellers <i>n</i> = 93		Lie tellers <i>n</i> = 82		<i>F</i>	<i>p</i>	$\eta^2$
	<i>M</i> ( <i>SD</i> )	95% CI	<i>M</i> ( <i>SD</i> )	95% CI			
Motivation	06.01 (00.99)	05.81, 06.22	05.94 (00.95)	05.73, 06.15	00.33	.564	.00
Believed by interviewer	06.23 (00.96)	06.03, 06.42	05.04 (01.19)	04.77, 05.30	54.66	<.001	.24
Likelihood of writing a statement	02.67 (01.48)	02.36, 02.97	03.41 (01.56)	03.07, 03.76	10.88	.001	.06
Likelihood of winning a prize	03.35 (01.85)	02.97, 03.74	03.51 (01.77)	03.12, 03.90	00.31	.581	.00
Truthfulness	99.35 (02.47)	98.85, 99.86	27.68 (19.96)	23.30, 32.07	1165.12	<.001	.87
Discussing only core details	03.11 (02.00)	02.70, 03.52	04.12 (01.70)	03.75, 04.50	12.86	<.001	.07

*Note.* All scales were measured on 7-point scales except truthfulness which was measured on a percentage scale.

Two ANOVAs with Veracity and Modality as factors and (a) truthfulness and (b) the extent to which participants limited themselves to discussing core details without elaboration so that the three interviews do not become too long as dependent variables, revealed that lie tellers were significantly less truthful than truth tellers and more likely to discuss core details to make the interviews shorter (refer to Table 2). No other significant effects emerged (all  $F$ s < .50, all  $p$ s > .609).

A Veracity  $\times$  Modality MANOVA was conducted with the extent to which the MS and the sketching task were anticipated, made the interview easy, and were helpful with what to say during the interview as dependent variables. Only participants in the MS-Sketch and Sketch-MS conditions were included in the analysis. A significant Modality main effect emerged, Pillai's Trace = .23,  $F(6, 63) = 3.18$ ,  $p = .009$ ,  $\eta^2 = .23$ . The Veracity main effect and the Veracity  $\times$  Modality interaction effect were not significant (all Pillai's Trace < .11, all  $p$ s > .325). Participants in the MS-Sketch condition ( $M = 4.41$ ,  $SD = 2.08$ , 95% CI [3.62, 5.20]) anticipated being exposed to the MS more than those in the Sketch-MS condition ( $M = 3.19$ ,  $SD = 1.89$ , 95% CI [2.60, 3.77]).

### **Incorrect Details**

We calculated a proportion score for incorrect details for each interview. For illustration, for incorrect person details mentioned in Interview 1, the proportion of incorrect person details was the total number of incorrect person details in Interview 1 divided by the total number of correct and incorrect person details in Interview 1. The proportion of incorrect PLATO details reported by truth tellers across interviews was close to zero (see Table 3). No differences emerged in the proportion of incorrect details among Modality conditions, Pillai's Trace = .43,  $F(30, 154) = 1.39$ ,  $p = .100$ ,  $\eta^2 = .21$ .

**Table 3***Descriptive statistics of the Proportion of Incorrect PLATO Details across Interviews*

Detail	Interview 1	Interview 2	Interview 3
Person	.02 (.04)	.02 (.04)	.02 (.04)
Location	.01 (.02)	.02 (.03)	.02 (.03)
Action	.02 (.02)	.02 (.02)	.03 (.03)
Temporal	.01 (.02)	.02 (.04)	.01 (.03)
Object	.02 (.04)	.03 (.05)	.03 (.05)

**Contradictions**

Contradictions frequently occurred: 71 (87%) out of 82 lie tellers contradicted themselves at least once ( $M = 3.88$ ,  $SD = 4.32$ ), compared to 58 (62%) out of 93 truth tellers ( $M = 1.55$ ,  $SD = 1.93$ ). A MANOVA with Veracity and Modality as the between-subjects factors and unique PLATO and total contradictions across Interviews 2 and 3 as the dependent variables revealed a significant multivariate effect of Veracity, Pillai's Trace = .15,  $F(5, 165) = 5.92$ ,  $p < .001$ ,  $\eta^2 = .15$ . Lie tellers reported more unique person contradictions,  $M = 0.76$ ,  $SD = 1.39$ , 95% CI [0.45, 1.06],  $F(1, 169) = 14.91$ ,  $p < .001$ ,  $\eta^2 = .08$ , unique action contradictions,  $M = 0.59$ ,  $SD = 1.04$ , 95% CI [0.36, 0.81],  $F(1, 169) = 17.91$ ,  $p < .001$ ,  $\eta^2 = .10$ , unique object contradictions,  $M = 1.29$ ,  $SD = 2.14$ , 95% CI [0.82, 1.76],  $F(1, 169) = 14.82$ ,  $p < .001$ ,  $\eta^2 = .08$ , and unique total contradictions,  $M = 3.88$ ,  $SD = 4.32$ , 95% CI [2.93, 4.83],  $F(1, 169) = 22.36$ ,  $p < .001$ ,  $\eta^2 = .12$ , than truth tellers ( $M = 0.16$ ,  $SD = 0.45$ , 95% CI [0.07, 0.25] for unique person contradictions;  $M = 0.11$ ,  $SD = 0.37$ , 95% CI [0.03, 0.18] for unique action contradictions;  $M = 0.39$ ,  $SD = 0.77$ ,

95% CI [0.23, 0.55] for unique object contradictions, and  $M = 1.55$ ,  $SD = 1.93$ , 95% CI [1.15, 1.95] for unique total contradictions).

### **Unique Details Across the Three Interviews**

Unique scores across the three interviews were computed for total details, PLATO details, complications, common knowledge details, and self-handicapping strategies. A 2 (Veracity: lie teller, truth teller)  $\times$  3 (Modality: MS-Sketch, Sketch-MS, control) MANOVA on these nine unique scores revealed a significant multivariate main effect of Veracity, Pillai's Trace = .46,  $F(8, 162) = 17.36$ ,  $p < .001$ ,  $\eta^2 = .46$ . No multivariate significant effects emerged for Modality, Pillai's Trace = .10,  $F(16, 326) = 1.05$ ,  $p = .406$ ,  $\eta^2 = .05$ , or for Veracity  $\times$  Modality, Pillai's Trace = .05,  $F(16, 326) = 0.56$ ,  $p = .913$ ,  $\eta^2 = .03$ . As Table 4 shows, strong to very strong evidence emerged that truth tellers' statements included more unique total details, unique PLATO details, and unique complications, and fewer unique common knowledge details than lie tellers' statements.

**Table 4***Descriptive and Inferential Statistics for Unique Details as a Function of Veracity*

Detail	Truth tellers		Lie tellers		<i>F</i>	<i>p</i>	<i>d</i> [95% CI]	BF <sub>10</sub>
	<i>n</i> = 93		<i>n</i> = 82					
	<i>M</i> ( <i>SD</i> )	95% CI	<i>M</i> ( <i>SD</i> )	95% CI				
Total	216.05 (83.85)	198.78, 233.32	128.61 (61.09)	115.19, 142.03	58.62	<.001	1.19 [0.87, 1.52]	1.083 × 10 <sup>10</sup>
Person	21.17 (09.65)	19.18, 23.16	16.26 (08.58)	14.37, 18.14	11.70	.001	0.54 [0.23, 0.84]	48.30
Location	74.24 (36.92)	66.63, 81.84	38.85 (22.63)	33.88, 43.83	55.26	<.001	1.16 [0.83, 1.48]	2.386 × 10 <sup>9</sup>
Action	57.66 (19.28)	53.69, 61.63	36.66 (18.71)	32.55, 40.77	50.93	<.001	1.11 [0.78, 1.43]	6.727 × 10 <sup>8</sup>
Temporal	29.97 (13.57)	27.17, 32.76	17.26 (10.02)	15.06, 19.46	46.67	<.001	1.07 [0.75, 1.38]	1.226 × 10 <sup>8</sup>
Object	33.02 (11.52)	30.65, 35.39	19.59 (10.65)	17.25, 21.92	61.36	<.001	1.21 [0.89, 1.54]	3.030 × 10 <sup>10</sup>
Complications	10.32 (05.20)	09.25, 11.39	03.87 (03.55)	03.08, 04.65	87.20	<.001	1.45 [1.11, 1.78]	2.006 × 10 <sup>14</sup>
CKD	00.32 (00.65)	00.19, 00.46	00.99 (01.34)	00.69, 01.28	17.67	<.001	0.64 [0.33, 0.94]	570.28
SHS	00.11 (00.37)	00.03, 00.18	00.16 (00.53)	00.04, 00.28	00.54	.463	0.11 [-0.19, 0.41]	0.21

Note. CI = Confidence interval; CKD = Common knowledge details; SHS = Self-handicapping strategies.