

Eliciting Veracity Differences Through a General Memory Recall Test

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Abstract

A preferred strategy amongst lie tellers is to keep their stories simple. In the present experiment we examined a possible way lie tellers could use to achieve this: Pretending to have a general poor memory. We gave participants the opportunity to reveal this poor memory in a general memory recall test. Participants first saw a video-recorded secret meeting and were led to believe that they would be interviewed about this video. Participants were instructed to recall it either truthfully [truth tellers] or deliberately distort some facts [lie tellers] and were given time to prepare themselves for the forthcoming interview. In the interview we showed participants a video [labelled tricks video] to test their general memory. We asked them to report this tricks video in as much detail and as accurately as possible. We finished the interview after this recall and never asked them to recall the secret meeting video. Half of the participants were asked to sketch while recalling the tricks video. Sketching is known to facilitate recall. As predicted, those who thought they had to lie about the secret meeting video performed worse in recalling the tricks video than those who thought they had to tell the truth about the secret meeting video, particularly in the sketching condition.

Keywords:

- Deception
- Self-handicapping strategies
- Memory recall test
- Strategies to appear convincing
- Dividing attention

Eliciting Veracity Differences Through a General Memory Recall Test

Truth tellers and lie tellers have different aims during an investigative interview. Truth tellers' aim is to help with the investigation [1]. To achieve this aim, they seem to focus on just one task: To recall the event in as many details as they can remember [2]. Lie tellers' aim is to come across as being sincere [1]. Lie tellers' aim is more difficult to achieve and requires multiple tasks. They should avoid reporting truthful facts that may incriminate themselves [1,3]. When they include fabricated facts, they should make sure that these facts sound plausible and are consistent with the rest of their statement and remember these fabricated facts for subsequent interviews so that they will not contradict themselves when interviewed multiple times about the same event [4-6]. Also, because they cannot take their credibility for granted, lie tellers may wish to control their behaviour so that it comes across as sincere, and to monitor the interviewer's behaviour to judge whether they still come across as sincere [7-9].

Truth tellers' and lie tellers' different aims and tasks during interviews are reflected in the strategies they employ during such interviews. Whereas truth tellers tend to 'tell it all', lie tellers prefer to keep their stories simple [10]. By keeping their stories simple, lie tellers lower the risk of providing incriminating information and it will also make lying easier. That is, they must invent fewer fabricated facts, must remember fewer fabricated facts for subsequent interviews, and can allocate more cognitive resources to controlling their behaviour and monitoring the interviewer.

One tactic lie tellers employ to keep their stories simple is using self-handicapping strategies: Providing justifications for why they cannot provide information. Examples are "I can't tell you much, I was distracted" and "We were both sick in bed with Covid so I cannot recall our conversation in much detail." Lie tellers report more self-handicapping comments than truth tellers [11].

In the present experiment we examined, apart from self-handi-

capping comments, another self-handicapping strategy lie tellers could use: Pretending to have a general poor memory. We gave participants the opportunity to reveal this poor memory in a general memory recall test. Participants saw a video recorded secret meeting and were led to believe that they would be interviewed about this video. They were instructed to recall it either truthfully [truth tellers] or deliberately distort some facts [lie tellers]. After preparing themselves for the interview we showed them a video depicting seven tricks to make an old mattress more comfortable [labelled tricks video] to test their general memory. We asked them to report this tricks video in as much detail and as accurately as possible. We never asked them to recall the secret meeting video.

Deliberately performing poorly on a general memory test, and thus pretending to have generally a poor memory, may become a useful self-handicapping strategy for lie tellers. It could give them an excuse not to provide much [accurate] information when asked about an alleged critical event after the general knowledge test and/or lower expectations amongst interviewers about how much information they may be able to recall about an alleged/critical event [6,12]. Poor memory could occur both in terms of the quantity [reporting less information] or quality [reporting incorrect details] [13].

That lie tellers perform more poorly on a general memory test than truth tellers, could occur for a different reason than self-handicapping: Lie tellers could be less focussed on the general memory task than truth tellers. Interviewees must divide their attention between the additional task [general memory test] and the story-telling task [e.g. secret meeting video recall] that they think will take place after the additional task. Lie tellers tend to perform more poorly on additional tasks than truth tellers [14]. This could happen for two reasons. First, lie tellers may think that the additional task is not as important as the story-telling task because they may consider performing poorly on the story-telling task as a more direct threat to their credibility than performing poorly on the additional task. Second, the story-telling task that interviewees think will take place after the general memory test will be more cognitively demanding for lie tellers than for truth tellers [15,16]. Lie tellers may therefore think more about the story-telling task than do truth tellers. As a result, lie tellers have fewer cognitive resources left over to perform the additional task.

Recalling complex events is an effortful task prone to forgetting, even for truth tellers [17]. One way to enhance memory recall is to ask interviewees to sketch the event they are narrating [18]. Sketching while narrating enhances memory recall amongst truth tellers for several reasons, summarised by [19]. (i) sketching mentally reinstates the context of the interviewee's experience; (ii) sketching is a visual output and therefore compatible with visually experienced events; (iii) sketching takes time and all that time the interviewee can think about the experience and search their memory; and (iv) sketching leads to providing spatial information because the responder [sketcher] must situate each object or person in a specific location in the sketch.

In the experiment half of the interviewees were asked to sketch while conducting the memory test. Sketching will work as a memory-enhancement technique only if interviewees are motivated to perform well in the general memory test. Interviewees who wish to self-handicap or wish to focus on the story-telling task during the general memory test [i.e. lie tellers] may be less motivated to do well in the general memory test than those who are not inclined to self-handicap or not too focused on the story-telling task [i.e. truth tellers].

Hypotheses

We tested the following three pre-registered hypotheses about recalling the general memory test video (<https://osf.io/bry8a>):

Hypothesis 1: Truth tellers will provide more details, describe the tricks more accurately and in a more accurate order and report fewer self-handicapping comments than lie tellers when reporting the tricks video [Veracity main effect].

Hypothesis 2: Participants in the sketching condition will provide more details, describe the tricks more accurately and in a more accurate order and report fewer self-handicapping comments than participants in the no sketching condition when reporting the tricks video [Sketch main effect].

Hypothesis 3: Truth tellers will provide more details, describe the tricks more accurately and in a more accurate order and report fewer self-handicapping comments than lie tellers when reporting the tricks video provide more details, particularly in the sketching condition [Veracity X Sketch interaction effect].

Method

Ethics

The experiment received ethics approval by the Faculty ethics committee of the university of the first author [C-2022-002].

Participants

A power analysis using G*Power software revealed that at least 131 participants are required to obtain an 95% statistical power, an alpha level of .05, and a medium to large effect size ($f^2 = .09$). A total of 131 participants took part in the experiment of whom 42 were males and 87 were females. Two participants did not say. The average age in the sample was $M = 26.77$ ($SD = 1.35$). Most participants ($n = 60$) identified themselves as white British, followed by Asian ($n = 21$), white European ($n = 17$), African ($n = 8$), mixed ($n = 8$), other ($n = 7$), Arab ($n = 5$), Black British ($n = 4$), and Black European ($n = 1$).

Allocation to the Veracity and Sketch conditions occurred randomly: 65 participants were allocated to the truth condition and 66 to the lie condition; 66 to the Sketch-absent condition and 65 to the Sketch-present condition. The sample sizes in each of the four cells ranged from 32 to 33.

Design

Data were analysed utilising a Veracity [truth vs lie] X Sketch

[present vs absent] between-subjects design. The following five dependent variables were included in the analysis: Total details, number of tricks accurately reported, number of tricks correctly mentioned in the sequence, number of tricks mentioned in the correct order, and number of self-handicapping comments

Procedure

Participants were recruited via the department's database [students, staff, members of the general public interested in taking part in research] and university online platforms. They were informed that they will be watching a video and will tell the truth or lie about it in an interview. The experiment was carried out online via Zoom and each participant was interviewed individually. At least 24 hours prior to their appointment, participants were sent the participant information sheet and consent form via Qualtrics, and the Zoom link to their appointment via email. During their appointment, participants were given the opportunity to ask the experimenter any questions they have, after which they gave their written consent.

First, participants watched a 6.30 min video about a mock secret meeting. In the meeting, a male agent presents to two other female agents the characteristics of a spying device that will be planted in a smoke detector to gather intelligence about a hostile agent's activities. The presenter then asks the two agents to vote on one of two locations [international school or chemical factory] to plant the device. The agents decide to plant it in a lecture room in the international school.

After watching the secret meeting video, the experimenter randomly allocated participants to the truth teller or lie teller condition. The participants were led to believe that they would be interviewed about the secret meeting video. Truth tellers were told the interviewer could be trusted and were asked to tell the truth about the secret meeting video. Lie tellers were told that the interviewer could not be trusted and could be a double agent. They were therefore asked to lie about the spying device and the location where it will be planted to protect the mission. The video was also used by [20]. Participants were then given as much time as they needed to prepare for the interview. Truth tellers and lie tellers were never asked to recall this secret meeting video in the interview. Instead, they were asked to recall the tricks video truthfully but were not told that at this stage. In other words, the lie tellers were not asked to lie at all in the interview. Yet, we call them 'lie tellers' because they were led to believe that they had to lie in the interview about the secret meeting video. The hypotheses predict that this will impact upon their verbal recall of the tricks video. When participants informed the experimenter that they were ready, they were sent the Qualtrics link to a pre-interview questionnaire that measured their measured background characteristics [age, gender, ethnicity]. After completing the questionnaire, they were given a link to a Zoom room where the interviewer was waiting.

The Interview

The interviewer was a research assistant who was blind to the par-

ticipants' veracity condition and research hypotheses. The interviewer instructed the participants as follows: "I understand you saw a video depicting a secret meeting. Before I ask you anything about the secret meeting video, I need to first test your general memory recall. I will show you a tricks video after which you will be asked to report everything that you saw in that tricks video as detailed and as accurately as possible." Participants were then shown a 10-min video of two physiotherapists describing seven tricks to make an old mattress more comfortable (https://www.youtube.com/watch?v=NJrA7obfZzA&ab_channel=Bob%26Brad).

We chose this tricks video because it provides enough detail, unlikely to have been seen by participants before [indeed participants were not familiar with it, see Results] and presents a clear sequence of actions [order in which the seven tricks are presented]. Reporting the tricks in the order in which they were presented should come natural to participants because the natural way of reporting information is sequentially [6,21]. This gave us the opportunity to introduce two accuracy measures [not only the tricks mentioned but also the order in which they were mentioned].

After watching the tricks video, participants in the Sketch-absent condition received the following instructions: "Now please tell me in as much detail and as accurate as possible everything in the tricks video you just watched. You may take as long as you need to recall the content." Participants in the Sketch-present condition were instructed as follows: "Now please tell me in as much detail and as accurate as possible everything in the tricks video you just watched. While doing so, I would like you to sketch on a white A4 sheet of paper everything you saw in the video. Thus, you need to sketch and talk at the same time. You may use more than one sheet of paper if needed, and you may take as long as you need to recall the content." All participants in the Sketch-present condition had blank A4 sheet of paper.

When participants finished recalling the tricks video, the interviewer told them that the interview was completed [they were never asked to recall the secret meeting video]. The interviewer redirected the participants to the experimenter who sent them a Qualtrics link to the post-interview questionnaire that they were asked to answer truthfully.

Post-Interview Questionnaire and Debrief

The post-interview questionnaire included statements about participants paying attention to the tricks video, their motivation to recall details about the tricks video, the extent to which they found themselves detailed when reporting the tricks video and the extent to which they thought they were accurate when reporting the tricks video. All statements could be rated on 7-point Likert scales ranging from 1 [not at all] to 7 [very much]. We also asked about their familiarity with the tricks video on a 7-point scale ranging from 1 [not at all] to 7 [very much].

Participants in the sketch condition were further asked to rate the extent to which they found sketching difficult [on a 7-point Likert

scale from 1 = *not at all* to 7 = *very difficult*], and the extent to which they thought it helped them recall details from the tricks video [on a 7-point Likert scale from 1 = *not at all* to 7 = *very much*].

After completing the questionnaire, the experimenter told participants that the experiment was over and explained the true purpose of the research. Participants were then thanked and remunerated with £10.

Coding

The interviews were transcribed and coded. One rater, blind to the Veracity conditions and hypotheses, was taught the coding scheme by the third author who designed most of the coding scheme [for all variables except total details and self-handicapping comments] specifically for this experiment.

Total number of details was the sum of all nouns, verbs adjectives and adverbs. Details were counted regardless of accuracy and repetitions were ignored. The word ‘video’ was not counted. The following sentence contains eight details: “On that video I saw two men, two American men, discussing seven tricks that help you to sleep”. The following sentence contains six details: “The second man kept a pillow between his knees”

The rater counted the number of tricks accurately reported. This variable could range from 0 to 7.

The tricks in the video were given sequential numbers [trick 1, 2, 3 etc.] representing the order in which they were introduced in the video:

Trick 1: Board or pillow under mattress

Trick 2: Sheet wrapped around lower back

Trick 3: Pillow between legs and/or feet

Trick 4: Arm canal for shoulder pain with two pillows beneath head and a throw pillow beneath chest

Trick 5: Two pillows between arms for upper sore shoulder

Trick 6: Leg wedge for back pain with pillow beneath legs

Trick 7: Throw pillow beneath mid-back

Participants received one point for each trick reported using the correct sequential number. This variable, labelled tricks sequence matched, could range from 0 to 7. We also introduced the tricks sequence general variable, which could also range from 0 to 7. For this variable, the general sequence order is relevant rather than the exact sequence number. For example, participants who say that Trick 1 was a board under the mattress, Trick 2 was a pillow between legs, and Trick 3 was a leg wedge would be given a score of 1 for the tricks sequence matched variable as only Trick 1 matches the sequential number above. However, they would receive a score of 3 for the tricks sequence general variable as the order of tricks was accurately reported.

Finally, every justification given for not being able to provide information was coded as a self-handicapping strategy comment. Examples are “I forgot because there were so many tricks”, “My

memory went a bit blank” and “I can’t remember the tricks in order, I was too fascinated with the two presenter guys”.

A second rater coded a random sample of 60 transcripts. Inter-rater reliability between the two coders, using the two-way random effects model measuring consistency, was very good for total details [Single Measures ICC = .76], total number of tricks accuracy [Single Measures ICC = .88], tricks sequence matched [Single Measures ICC = .83], tricks sequence general [Single Measures ICC = .82] and self-handicapping comments [Single Measures ICC = .95].

Results

Familiarity with Memory Recall (Tricks) Video

A 2 [Veracity: Truth vs lie] X 2 [Sketch: Present vs absent] ANOVA was carried out with familiarity with the tricks video as dependent variable. The Veracity main effect, $F[1, 127] = 0.02, p = .893, d = .03, 95\% \text{ CI}[-0.32, 0.37]$, Sketch main effect, $F[1, 127] = 2.73, p = .101, d = .28, 95\% \text{ CI}[-0.07, 0.62]$ and Veracity X Sketch interaction effect $F[1, 127] = 2.73, p = .101, \eta_p^2 = .02$, were not significant. The grand mean score reveals that the tricks video was largely unknown [$M = 1.84, SD = 1.57$] amongst participants.

Questionnaire Variables

A 2 [Veracity: Truth vs lie] X 2 [Sketch: Present vs absent] MANOVA was carried out with as dependent variables [all measured on 7-point Likert scales]: Attention to the tricks video, motivation to report details about the tricks video, detailedness in reporting the tricks video and accuracy in reporting the tricks video. At a multivariate level the analysis revealed no significant main effects for Veracity, $F[4, 124] = 0.09, p = .985, \eta_p^2 = .003$ and Sketch, $F[4, 124] = 0.20, p = .938, \eta_p^2 = .006$. Also, the Veracity X Sketch interaction effect was not significant, $F[4, 124] = 0.40, p = .809, \eta_p^2 = .01$.

The mean scores for the total sample showed that participants reported that they were attentive when watching the tricks video [$M = 5.14, SD = 1.84$], motivated to report details about the tricks video [$M = 5.44, SD = 1.55$], and thought to be reasonably detailed [$M = 4.63, SD = 1.55$], and reasonably accurate [$M = 4.93, SD = 1.39$] in reporting the tricks video.

Participants in the Sketch-present condition were asked the extent to which they found the sketching task difficult and the extent they thought it helped them in reporting details about the tricks video. Two ANOVAs with Veracity as the only factor and those two variables as dependent variables did not reveal a significant effect, both $F_s < 2.86$, both $p_s > .095$. The average means showed that the sketching task was judged to be moderately difficult [$M = 4.29, SD = 1.78$] and had helped them to a moderate extent to report details [$M = 3.87, SD = 1.82$].

Hypotheses-Testing

A 2 [Veracity: Truth vs lie] X 2 [Sketch: Present vs absent] MANOVA was carried out with total details reported about the tricks video, number of tricks accurately reported, number of tricks

correctly mentioned in the sequence, number of tricks mentioned in the correct order, and number of self-handicapping comments as dependent variables. At a multivariate level, the Veracity main effect, $F [5, 123] = 1.86, p = .106, \eta_p^2 = .07$, the Sketch main effect, $F [5, 123] = 1.79, p = .120, \eta_p^2 = .07$ and the Veracity X Sketch interaction effect $F [5, 123] = 1.18, p = .332, \eta_p^2 = .05$ were not significant.

Despite the absence of multivariate effects, we believe that univariate testing is appropriate. First, some of the dependent variables were highly correlated, particularly number of tricks accurately

reported with (i) accuracy in tricks sequence matched, $r [131] = .728, p < .001$ and (ii) accuracy in tricks sequence general, $r [131] = .824, p < .001$. When dependent variables are correlated the multivariate statistics can become unreliable and may identify effects smaller than regular ANOVAs can find [22]. Second, it is worthwhile to examine the effects of the factors on specific variables. For example, although previous research has shown that the instruction to sketch results in interviewees reporting more details, it is yet unknown whether they also do this more accurately. The univariate main effects for Veracity and Sketch are presented in Tables 1 and 2.

Table 1: Questionnaire Variables and Memory Cues as a Function of Veracity

	Truth			Lie			NHST		
	<i>M</i>	(<i>SD</i>)	95% CI	<i>M</i>	(<i>SD</i>)	95% CI	<i>F</i>	<i>p</i>	d (95% CI)
Questionnaire variables									
Attention to tricks video	5.17	1.58	4.80,5.54	5.11	1.39	4.74,5.47	0.06	.812	0.04 (-0.30,0.38)
Motivation to recall tricks video details	5.43	1.58	5.05,5.81	5.45	1.53	5.07,5.84	0.01	.926	0.01 (-0.33,0.36)
Detailedness in reporting tricks video	4.62	1.50	4.23,5.00	4.65	1.61	4.27,5.03	0.02	.891	0.02 (-0.32,0.36)
Accuracy in reporting tricks video	4.97	1.33	4.62,5.31	4.89	1.45	4.55,5.23	0.09	.766	0.06 (-0.29,0.40)
Memory test									
Total details	35.85	14.43	31.77,39.97	38.61	19.24	34.54,42.68	0.88	.351	0.16 (-0.18,0.50)
Total number of tricks accurately re-reported	3.12	1.65	2.70,3.56	2.62	1.89	2.20,3.05	2.77	.098	0.28 (-0.07,0.62)
Tricks sequence matched	1.65	1.47	1.27,2.03	1.44	1.63	1.06,1.82	0.60	.441	0.14 (-0.21,0.48)
Tricks sequence general	2.34	1.47	1.98,2.71	1.82	1.56	1.45,2.18	4.01	.047	0.52 (0.16,0.86)
Self-handicapping comments	0.11	0.40	0.01,0.21	0.14	0.43	0.04,0.24	0.16	.692	0.07 (-0.27,0.41)

Note. NHST = Null-hypothesis significance testing.

Table 2: Questionnaire Variables and Memory Cues as a Function of Sketching

	Sketch absent			Sketch present			NHST		
	<i>M</i>	(<i>SD</i>)	95% CI	<i>M</i>	(<i>SD</i>)	95% CI	<i>F</i>	<i>p</i>	d (95% CI)
Questionnaire variables									
Attention to tricks video	5.15	1.57	4.79,5.52	5.12	1.40	4.76,5.49	0.01	.914	0.02 (-0.32,0.36)
Motivation to recall tricks video details	5.47	1.53	5.09,5.85	5.42	1.58	5.03,5.80	0.04	.838	0.03 (-0.31,0.37)
Detailedness in reporting tricks video	4.58	1.61	4.20,4.96	4.69	1.50	4.31,5.07	0.18	.676	0.07 (-0.27,0.41)
Accuracy in reporting tricks video	4.95	1.42	4.61,5.30	4.91	1.37	4.56,5.25	0.04	.844	0.03 (-0.31,0.37)
Memory test									
Total details	33.83	14.95	29.76,37.90	40.69	18.35	36.54,44.75	5.44	.021	0.41 (0.06,0.75)
Total number of tricks accurately reported	2.56	1.87	2.13,2.99	3.18	1.66	2.76,3.62	4.25	.041	0.35 (0.00,0.69)
Tricks sequence matched	1.47	1.44	1.09,1.85	1.62	1.67	1.24,2.00	0.30	.583	0.15 (-0.20,0.49)
Tricks sequence general	1.91	1.44	1.54,2.28	2.25	1.61	1.88,2.62	1.72	.193	0.22 (-0.12,0.56)
Self-handicapping comments	0.12	0.41	0.02,0.22	0.12	0.42	0.02,0.22	0.00	.984	0.00 (-0.34,0.34)

Note. NHST = Null-hypothesis significance testing.

Only one significant Veracity effect emerged. Truth tellers reported the order of tricks more accurately than lie tellers. Given that all other Veracity effects were not significant, we conclude that Hypothesis 1 was not supported. Two significant Sketch effects emerged. Sketching resulted in interviewees providing more details. It also resulted in more tricks being accurately reported. This supports Hypothesis 2, particularly in terms of the amount of information provided.

No significant Veracity X Sketch interaction effect was obtained at a univariate level, all F s < 2.38, all p s > .125, but these effects refer

to any type of interaction. As we predicted a directional effect with specific group differences, a more informative test of Hypothesis 3 is to statistically test for significant differences between truth tellers and lie tellers in each of the two Sketch conditions and to compare the d -values in the two sets of analyses [6,23,24] Comparing d -values between the Sketch-present and Sketch-absent conditions is important. A p -value provides information about the statistical relevance but not about the practical importance of an effect [25]. In this article, we are interested in the practical relevance of the effect and d -values are indicators of practical relevance [26].

Table 3: Memory Cues as a Function of Veracity for Sketch Absent and Sketch Present Conditions

	Truth			Lie			NHST		
	M	(SD)	95% CI	M	(SD)	95% CI	F	p	d (95% CI)
SKETCH ABSENT									
Total details	34.21	16.36	28.97,39.45	33.45	13.65	28.22,38.69	0.42	.839	0.05 (-0.44,0.54)
Total number of tricks accurately reported	2.64	1.82	1.98,3.29	2.48	1.94	1.83,3.14	0.11	.744	0.07 (-0.42,0.55)
Tricks sequence matched	1.42	1.39	0.92,1.93	1.52	1.50	1.01,2.02	0.07	.800	0.07 (-0.42,0.55)
Tricks sequence general	1.97	1.43	1.46,2.48	1.85	1.48	1.34,2.35	0.12	.736	0.08 (-0.41,0.57)
Self-handicapping comments	0.12	0.42	-0.02,0.27	0.12	0.42	-0.02,0.27	0.00	1.00	0.00 (-0.49,0.49)
SKETCH PRESENT									
Total details	37.53	12.15	31.09,43.97	43.76	22.60	34.42,50.10	1.90	.173	0.34 (-0.15,0.82)
Total number of tricks accurately reported	3.63	1.31	3.06,4.19	2.76	1.86	2.20,3.32	4.71	.034	0.54 (0.04,1.02)
Tricks sequence matched	1.88	1.54	1.29,2.46	1.36	1.77	0.79,1.94	1.55	.218	0.31 (-0.18,0.79)
Tricks sequence general	2.72	1.44	2.17,3.27	1.79	1.65	1.25,2.33	5.84	.019	0.60 (0.10,1.08)
Self-handicapping comments	0.09	0.39	-0.05,0.24	0.15	0.44	0.01,0.30	0.31	.579	0.14 (-0.34,0.63)

Note. NHST = Null - Hypothesis Significance Testing

Two MANOVAs were conducted with Veracity as the only factor and the five variables mentioned in Table 3 as dependent variables, one MANOVA for the Sketch-absent condition and one MANOVA for the Sketch-present condition. The multivariate effect in the MANOVA for the Sketch-absent condition was not significant, $F[5, 60] = 0.20, p = .963, \eta_p^2 = .02$. At a univariate level, none of the effects were significant either [all p s > .735] and all effect sizes were very small [all d 's < 0.09]. In contrast, the multivariate effect in the MANOVA for the Sketch-present condition was significant, $F[5, 59] = 3.26, p = .012, \eta_p^2 = .22$ and at a univariate level, two significant effects with medium effect sizes emerged [with a combined average $d = 0.57$]. Truth tellers were more accurate than lie

tellers in reporting the tricks and the general sequence in which they occurred. This provides support for Hypothesis 3.

Discussion

In this article we reasoned that lie tellers would perform worse than truth tellers on the general memory test [i.e. recalling the tricks video], either due to self-handicapping or due to a lack of focus during the general memory test. Indeed, lie tellers did perform worse on the general memory test than truth tellers, albeit only in the Sketch-present condition. In that condition, lie tellers were less accurate than truth tellers in reporting the tricks and the general sequence in which they occurred.

Our results did not clarify what caused the effect. Lie tellers did not make more self-handicapping comments [justifications why they could not report information] than truth tellers when recalling the tricks video. The number of self-handicapping comments was low so perhaps this represents a floor effect. It may not be surprising that few self-handicapping comments were made. Interviewees had watched the tricks video just before the memory recall task and may have had difficulty thinking about justifications why they would not be able to recall the video. The information the participants provided in the post-interview questionnaire [self-reports] did not show evidence of self-handicapping either. That is, truth tellers and lie tellers reported to have been equally detailed and equally accurate when recalling the tricks video. However, self-reports are known to be somewhat unreliable [27].

An alternative explanation for lie tellers performing more poorly on the memory test than truth tellers is that lie tellers were more focussed than truth tellers on what they thought would be the task ahead [reporting the secret video], and thus put less effort in recalling the tricks video. However, lie tellers and truth tellers self-reported to be equally motivated to perform well in the recall of the tricks video and to have been equally attentive in watching the tricks video. Of course, practically it does not matter what exactly causes the effect [self-handicapping, lack of focus, a combination of the two or something else] if the result remains the same [lie tellers perform poorer than truth tellers on the general memory test]. Theoretically it is more relevant. Identifying the cause of the effect provides insight into truth tellers' and lie tellers' strategies or mental states and possible differences between them. Interview protocols could subsequently be developed aimed at exploiting these differences [28,29]. Future research could attempt to identify the exact cause of the effect. In such research underlying factors should be examined experimentally rather than through self-reports as we did in the current experiment, due to the unreliability of self-reports [27].

We predicted that sketching would enhance the veracity differences in the memory recall test, which is indeed what we found. We found that sketching was a necessary requirement to obtain veracity differences because they only occurred in the Sketch-present condition. Introducing instructions such as sketching is called an active interview protocol, in contrast to a passive interview protocol in which an interviewee is just asked to recall the event in as much detail as possible [28]. Our findings suggest that a more active interview protocol is required to elicit veracity differences in memory recall tests. It is a common finding in the verbal deception literature that active interview protocols are required to elicit veracity differences [30-33].

One of the main problems in verbal veracity assessment is that cut-off scores cannot be established. Large individual [e.g. differences in being talkative or memory] and situational differences [e.g. topic of investigation] make it impossible to establish unique lie telling and unique truth telling response patterns [34,35,29]. Cut-off scores are helpful when someone must make a veracity decision

in an individual case, a situation that practitioners often face. A memory recall test as a method to detect deceit has the potential for establishing cut-off points. That is, data sets could be developed about how much information truth tellers and lie tellers recall in a specific memory recall test. An individual response can then be compared with the distributions of truth tellers and lie tellers in the data set and could give an idea of the likelihood that someone is a truth teller or a lie teller. Or in other words, if someone reports little information when describing their experiences in the investigative part of an interview, one possibility is that the interviewee is lying. The memory test could shed light on this. We acknowledge that this train of thought, which is based on one single experiment, is premature. More research should be carried out first: We need to (1) conclusively demonstrate that lie tellers indeed perform worse than truth tellers in memory tests; (2) examine which factors cause the effect and (3) examine the effect of introducing a memory test on the recall of the main event later in an interview. Hopefully this article will encourage researchers to carry out such research.

We further found that the request to sketch resulted in interviewees reporting more information. This supports the growing body of research that sketching benefits reporting visual experiences in adults [18,19,36,37,]. This finding has been replicated with children [38-40]. A relevant question is whether the increase in quantity of information occurs at the expense of the accuracy of that information [13]. Obtaining more information is more beneficial if it does not negatively affect accuracy. Our results showed that increased quantity did not negatively affect accuracy, demonstrating a real beneficial effect of the sketching instruction to obtain information.

Data Availability Request

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

Author contributions

The first author designed the experiment [together with the second author], analysed the data [together with the third author] and wrote the initial draft [together with the third author]. The second author came up with the initial idea, designed the experiment [together with the first author] and commented on the initial draft. The third author analysed the data [together with the first author], wrote the initial draft [together with the first author] and set up the experiment. The fourth author commented on the initial draft.

Conflict of Interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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