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**Using the Model Statement to Elicit Verbal Differences between Truth tellers and Liars  
amongst Arab interviewees: A Partial Replication of Leal, Vrij, Deeb and Jupe (2018)**

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This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1002/acp.3536

## Abstract

Leal, Vrij, Deeb and Jupe (2018) found -with British participants- that a Model Statement elicited (1) more information and (2) a cue to deceit: After exposure to a Model Statement liars reported significantly more peripheral information than truth tellers. We sought to replicate these findings with Arabs living in Israel. Truth tellers and liars reported a stand-out event that they had (truth tellers) or pretended to have (liars) experienced in the last two years. Half of the participants were given a Model Statement in the second phase of the interview. Replicating Leal et al. (2018a), (i) truth tellers reported more core details than liars initially and (ii) a Model Statement resulted in more additional core and peripheral details in the second phase of the interview. Unlike in Leal et al. (2018a), a Model Statement did not have a differential effect on truth tellers in the current experiment.

Accepted Article

In the last decade researchers started to examine interview protocols aimed at eliciting verbal cues to deceit (Vrij, Fisher, & Blank, 2017; Vrij & Granhag, 2012). One example is the Model Statement tool. One Model Statement study examined the effect of a Model Statement on reporting core and peripheral information (Leal, Vrij, Deeb, & Jupe, 2018a). In that study, using British participants, it was found that a Model Statement elicited more peripheral details in liars than in truth tellers. Investigators are typically interested in whether tools that work in Western cultures also work in other cultures (Leal et al., 2018b; Vernham, Vrij, & Leal, 2018). To answer this question, cross-cultural research is required. In the present experiment, we sought to replicate Leal et al.'s (2018a) findings amongst Arab participants.

The Model Statement tool is a method aimed at eliciting information and verbal cues to deceit (Vrij, Leal, & Fisher, 2018a) and is an example of a detailed report about an event unrelated to the topic of investigation (Leal, Vrij, Warmelink, Vernham, & Fisher, 2015). It is typically presented in an audio-format at some point during an interview (Vrij et al., 2018a). Interviewees typically underestimate how much information is required from them (Vrij, Hope, & Fisher, 2014) and a Model Statement raises their expectations about how much information they should provide (Ewens et al., 2016). A Model Statement raises such expectations in both truth tellers and liars, resulting in both groups typically adding an equal amount of additional details (see Vrij et al. [2018a] for an overview of Model Statement deception research published to date). Although the quantity of details did not distinguish truth tellers from liars after exposure to a Model Statement, the quality of details did: The details added by truth tellers sounded more plausible than those added by liars (Leal et al., 2015) and included more complications (Vrij et al., 2017; 2018b). In contrast, liars added more peripheral details than truth tellers (Leal et al., 2018a). In the present experiment, we focused on the peripheral details finding.

A distinction can be made between core and peripheral details. Core details focus on the important part of the story, other details are considered peripheral (Heuer & Reisberg, 1990). For example, if someone discusses watching a rugby match, information about what happened during the game is core information, and information about how to get to the stadium and the drinks afterwards is considered peripheral information.

Leal et al. (2018a) argued that both truth tellers and liars realise that providing a lot of information sounds credible to observers (Bell & Loftus, 1989; Johnson, Foley, Suengas, & Raye, 1988). This notion is further encouraged by exposure to a Model Statement. Truth tellers, who have actually experienced an event, should be able to provide more core and peripheral information after exposure to a Model Statement, but for liars, who have not actually experienced the event, providing more core information is difficult and risky. It is difficult because they have to fabricate information; it is risky because the fabricated information may provide leads to investigators that, when followed-up, shows that the information is untrue (Nahari, 2018). Leal et al. (2018a) thus reasoned that after exposure to a Model Statement liars may avoid providing more core details to minimise the risk of presenting incriminating information, but may compensate for this by providing peripheral details so that their stories still contain many details.

The current study replicated Leal et al.'s (2018a) procedure. Truth tellers and liars gave an initial free recall, which was then followed—or not followed—by a Model Statement. Hereafter, the interviewees gave a second free recall followed by the request to tell the story in reverse chronological order. Reverse order recall stimulates a truth teller to think about the event again from a different perspective, which often leads to additional information (Fisher & Geiselman, 1992). Leal et al. (2018b) thought it to be unlikely that liars would report as much additional information as truth tellers in the reverse order recall. First, liars often believe that it is important to be consistent to sound convincing (Deeb et al.,

2018), but additional information results in less consistency (Fisher, Vrij, & Leins, & 2013).

Second, a reverse order recall is mentally taxing, particularly for liars, whose cognitive resources have already been partially depleted by the cognitively demanding task of lying (Vrij et al., 2008). Experiencing substantial cognitive load while reporting in reverse order may result in providing fewer details, regardless of the type of detail (core or peripheral).

The Model Statement technique is used by practitioners (Vrij, Leal, & Fisher, 2018). It is important to thoroughly test tools that are used in the field (Vrij & Fisher, 2016), which includes testing tools in different settings, such as interpreter settings (Ewens, Vrij, Mann, & Leal, 2016b; Vrij et al., 2017; 2018b) or in cross-cultural settings. Cross-cultural research into verbal cues to deceit is sparse, but the few studies in this area indicate that results do differ cross-culturally. For example, in one study it was found that a decrease in first person pronouns as a sign of deceit was moderated by culture: White British participants reduced their first-person pronouns to the greatest extent and North African participants to the least extent, with White European and South Asian participants in between those two groups (Taylor, Lerner, Conchie, & Menacere, 2017). In another study it was found that the use of spatial information was indicative of deception in North African and Pakistani populations but indicative of truth in Arab and White British populations (Taylor, Lerner, Conchie, & van der Zee, 2014). The five verbal cues to deceit that did emerge in Leal et al. (2018b) were not equally present in all three ethnic groups that were examined (British, Chinese and Arabs) but appeared to be more dominant in one culture than in another culture. However, an erratic pattern emerged in which culture a cue was most dominant.

In terms of reporting total details, Leal et al. (2018b) found that British participants reported more details than their Chinese and Arab counterparts. Although in each culture truth tellers reported more details than liars, the effect was most pronounced in the British sample. This finding in particular (less pronounced results in the other cultures) makes the

current study relevant. Although current knowledge does not allow us to make different predictions than Leal et al. (2018b) made, the available verbal cues to deception research makes clear that their findings cannot be generalised to other cultures without testing.

### **Hypotheses**

We tested the same hypotheses as Leal et al. (2018a). In the second recall, more core and peripheral details will be reported in the Model Statement present than in the Model Statement absent condition (Hypothesis 1). Truth tellers will report more new core details than liars in the second recall, particularly in the Model Statement present condition (Hypothesis 2). Liars will report more new peripheral details than truth tellers in the second recall, particularly in the Model Statement present condition (Hypothesis 3). Liars will report fewer new core and peripheral details than truth tellers in the reverse order recall, particularly in the Model Statement present condition (Hypothesis 4).

### **Method**

#### **Participants and Design**

A total of 108 participants were recruited through announcements posted in university buildings and word of mouth. One interview had to be excluded due to equipment failure. Due to an administrative error the allocation of interviewers to the Model Statement absent and present conditions was not counterbalanced. One of the four interviewers only carried out one interview in the Model Statement present condition and 17 interviews in the Model Statement absent condition. That interviewer elicited considerably more details from interviewees in the initial interview ( $M = 64.50$ ,  $SD = 44.15$ , 95% [51.49, 77.51]) than his three colleagues combined ( $M = 36.89$ ,  $SD = 23.42$ , 95% CI [31.03, 42.74]),  $F(1, 103) = 14.72$ ,  $p < .001$ ,  $d = 0.99$  (95% CI [.45, 1.50]). To control for the effect of Interviewer on the results, we included Interviewer as a covariate in the preliminary and hypotheses-testing analyses. Volunteers were invited to take part in a study that examined how good individuals

are at telling the truth or lying about memorable events. Participants received a reward of 50 shekels for taking part in the research, and their names were entered in a draw to win a prize of the equivalent in shekels of £50, £75, or £150 (250, 350 and 500 shekels). The sample included 79 females and 28 males, and their average age was 20.86 years ( $SD = 1.74$ ).

A 2 (Veracity: truth teller vs liar)  $\times$  2 (Model Statement: absent vs present) between-subjects design was used. Participants were randomly allocated to the Veracity and Model Statement conditions with between 26 to 28 participants in each cell. The dependent variables were initial core details, initial peripheral details, initial total details, new core details in second recall, new peripheral details in second recall, total new details in second recall, new core details in reverse order recall, new peripheral details in reverse order recall, and total new details in reverse order recall. In each case total details refers to core and peripheral details combined.

### **Procedure**

The procedure was identical to Leal et al. (2018a). The only difference was that the study took place in Israel with Arab interviewees rather than in the UK with British interviewees. All materials were translated into Arabic and the experimenter and four interviewers were Arabs.

**Initial instructions.** Truth tellers were asked to think of a memorable event that happened to them in the past two years that was out of the ordinary. To make them think of such an event, examples were given such as seeing a famous person when they were out for dinner, or going on a pheasant shoot. Liars and truth tellers were matched for memorable events. That is, liars were asked to lie about an event chosen by a truth teller and to pretend they had experienced that event. Matched liars and truth tellers were allocated to the same Model Statement condition.

Participants were informed that they needed to convince the interviewer that they were honest in the interview that would follow. To motivate them, they were told that if they are convincing, their names will be entered in a draw to win 250, 350 or 500 shekels. However, if they are not convincing, they will be asked to write a statement about the event and their names will not be entered in the draw. In reality, all participants were entered in the draw and nobody was asked to write a statement. Participants then honestly completed a pre-interview questionnaire that asked about their background characteristics and their motivation to convince the interviewer (1= *not at all* to 7 = *completely*). Participants were given time to prepare themselves for the interview. They were brought to the interview when they felt ready to be interviewed.

**Interviews.** One of four interviewers, blind to the participants' Veracity condition, interviewed participants. Interviewers were instructed how to conduct the interview. They were asked to be friendly, not to interrupt the interviewee and to adhere with the interview protocol (ask each question and never ask additional questions). Transcripts of the interviews showed that each interviewer adhered to the interview protocol.

All participants were asked to give an initial detailed free recall of the event. "Hello, I understand from my colleague that on <month and year > you <event >. Could you please tell me in as much detail as possible everything about that event?" After this initial recall, the interviewer left the room and returned after about fifteen seconds. The interviewer then introduced the request for the second recall in the Model Statement absent condition as follows: "Sorry but I am going to have to ask you again. Please tell me in as much detail as possible exactly what happened on <month and year > when you <event >?" In the Model Statement present condition, the request for the second recall was introduced as follows: "Please tell me in as much detail as possible exactly what happened on <month and year > when you <event > but this time before doing so I would like to play you a model statement

to give you an idea of exactly how much detail I would like you to include in your response. OK?”

An audiotaped Model Statement lasting 1.30 minutes was then played, a detailed account of someone attending a Formula 2 motor racing event (Leal et al., 2015). The account was a spontaneous, unscripted recall of an event truly experienced by the person. After the Model Statement, the interviewer said: “OK so remembering the amount of detail in the model statement, could you please tell me once more what happened on *<month and year>* when you *<event>*?”

After the interviewees provided the second recall, the reverse order request was introduced in both Model Statement conditions: “Thank you that was helpful, however, we know from research that asking individuals to recall their statement in reverse order helps with their memory of the event. Therefore, I would like you to recall the event, in reverse order, starting from when *<event>* ended and talk back to when *<event>* started.” After completing the reverse order recall, participants completed a post-interview questionnaire where they were asked to rate on a percentage scale (0% - 100%) the extent to which they were truthful in their recalls. Lastly, they were fully debriefed, rewarded, and thanked.

### **Coding**

All interviews were audiotaped, transcribed into Arabic and then translated into English. For the coding, the English transcripts were used. We do not know how much information was lost in translating the text from Arabic to English, but we do not expect much. We used a bilingual person for this task and stressed the importance of translating each word. In a long consecutive interpreting study – in which the interpreter summarised the interviewee’s answers - it was found that about 10% of information got lost through interpretation (Ewens et al., 2017). Long consecutive interpreting is more difficult than translating from a transcript, so the potential loss of information is most likely considerably

less than 10%. Of course, in all research based on translations, conclusions can only be as strong as the translations are accurate.

Every noun, verb, adjective, and adverb was considered a single detail, but other details such as conjunctions, prepositions, and pronouns were not counted because they are not precise and thus not informative. To illustrate our coding scheme, we will use an example from a participant who was talking about ‘witnessing an illness incident’.

The participant’s statement “We were sitting in a café and we ordered juice” includes four details (were sitting, café, ordered, juice). These details are peripheral details as they are irrelevant to the illness incident. Also, the statement “The waiter brought the cup for my friend and it spilled a bit, so I told my friend to change it” includes eight peripheral details (waiter, brought, cup, friend, spilled, bit, told, change).

The same participant reported “her stomach started hurting a lot and she started to roll in pain. In the end she turned yellow and fell on the ground” which includes core information about witnessing the illness incident. More specifically, this statement includes 11 core details (stomach, started, hurting, a lot, roll, pain, in the end, turned, yellow, fell, ground).

Details that were repeated in a single recall were coded only once. As an example, the participant above mentioned the term ‘started’ twice when reporting core details, but ‘started’ was coded only once in this context. However, some participants mentioned the same detail but in different contexts. In this case, the same detail was coded more than once.

In the second and third recalls, new core and peripheral details were marked. Details mentioned in the second recall but not in the initial recall, and details mentioned only in the third reverse order recall were marked as new details.

The same coder as in Leal et al. (2018a) coded the transcripts. She was blind to Veracity and Model Statement conditions. A second coder, also the same as in Leal et al. (2018a), coded 20 transcripts. Inter-rater reliability analyses revealed that the Intra-Class Correlation

coefficients (*ICC*, single measures scores) were .85 for core details, .87 for peripheral details, and .75 for new details

## Results

### Motivation and Truthfulness

Two 2 (Veracity: truth vs lie) X 2 (Model Statement: present vs absent) ANOVAs were carried out with motivation and truthfulness as dependent variables. Truth tellers ( $M = 6.21$ ,  $SD = .95$ , 95% CI [5.88, 06.53]) and liars ( $M = 5.76$ ,  $SD = 1.39$ , 95% CI [5.43, 06.08]) reported to be equally motivated to convince the interviewer of their truthfulness,  $F(1, 103) = 3.78$ ,  $p = .055$ ,  $d = .36$ , 95% CI [-0.02, 0.74],  $BF_{10} = 1.10$ . The average mean score shows that participants reported to be very motivated. The difference in motivation between the Model Statement absent ( $M = 6.09$ ,  $SD = 1.11$ , 95% CI [5.78, 6.41]) and Model Statement present ( $M = 5.87$ ,  $SD = 1.30$ , 95% CI [5.54, 6.19]) conditions was not significant either,  $F(1, 103) = 0.99$ ,  $p = .323$ ,  $d = .17$ , 95% CI [-0.21, 0.54],  $BF_{10} = 0.31$ .

Truth tellers reported to have been more truthful ( $M = 98.49$ ,  $SD = 3.61$ , 95% CI [91.89, 105.10]) than liars ( $M = 27.78$ ,  $SD = 33.63$ , 95% CI [21.20, 34.28]). This difference was significant,  $F(1, 103) = 227.72$ ,  $p < .001$ ,  $d = 2.96$ , 95% CI [2.37, 3.45],  $BF_{10} = 8.02^{24}$ .

That liars were to some extent truthful (27.78%) fits well with the notion that liars, where possible, try to embed their lies in truthful stories (Leins, Fisher, & Ross, 2013). The difference in truthfulness between the Model Statement absent ( $M = 62.91$ ,  $SD = 42.89$ , 95% CI [57.05, 70.02]) and Model Statement present ( $M = 62.69$ ,  $SD = 43.16$ , 95% CI [57.05, 70.02]) conditions was not significant,  $F(1, 103) = 0.03$ ,  $p = .857$ ,  $d = .02$ , 95% CI [-0.36, 0.40],  $BF_{10} = 0.21$ . The Veracity x Model Statement interaction effects for motivation and truthfulness were not significant, both  $F$ 's  $< .108$ , both  $p$ 's  $> .743$ , both  $BF_{10} = < 0.74$

## Preliminary Analyses

For this section and the next Hypothesis-testing section we replicated the analyses reported in Leal et al. (2018a). We present the results in Tables 1 and 3 in the same way as reported in Leal et al. (2018a). We also summarised the Leal et al. (2018a) findings in the tables. In the last two columns, we report the pattern of the results and the Cohen  $d$ -scores reported in Leal et al. (2018a), whereby  $d$ -scores in bold refer to significant effects. In Tables 1 and 3 we report for each variable whether truth tellers provided more ( $T > L$ ) or fewer details than liars ( $L > T$ ) in Leal et al. (2018a). In Table 2 we report whether the Model Statement present condition resulted in more ( $MS > C$ ) or fewer details ( $C > MS$ ) than the control condition in Leal et al. (2018a).

Unlike Leal et al. (2018a) we also carried out Bayes Factor analyses using JASP software. Bayes Factor analyses is a method to test the probability of the observed data under the null hypothesis compared to the alternative hypothesis (Wetzels & Wagenmakers, 2012). A  $BF_{10}$  smaller than 1 indicates evidence for the absence of an effect (support of the null hypothesis);  $BF$ s between 1 and 3 suggest weak evidence,  $BF$ s between 3 and 10 suggest strong evidence and  $BF$ s  $> 10$  very strong evidence for the alternative hypothesis (Jeffreys, 1961). We used the default Cauchy's prior of .707 for the Bayesian  $t$ -tests (Lakens, 2016).

Three 2 (Veracity: truth vs lie) X 2 (Model Statement: present vs absent) ANCOVAs were carried out with core details, peripheral details and total details in the initial recall as dependent variables and Interviewer as a covariate. Although the initial recall took part before the Model Statement was introduced we followed Leal et al. (2018a) and included Model Statement as a factor in the design. The results revealed very strong evidence that truth tellers reported more core details than liars and strong evidence that they reported more peripheral details than liars. In addition, very strong evidence emerged that truth tellers reported more total details than liars in the initial recall, see Table 1. This is a typical finding

in deception research (Amado, Arce, & Fariña, 2015; Vrij, 2008). The findings for core details and total details replicated Leal et al. (2018a). A main effect for Model Statement emerged for peripheral details. Although participants in the Model Statement present condition reported in the initial recall more peripheral details than participants in the Model Statement absent condition, the Bayes Factor analysis showed support for the null-hypothesis, see Table 2. We can thus disregard this effect. The Bayes Factor analysis showed weak evidence for the finding that participants in the Model Statement present condition reported in the initial recall more core details than participants in the Model Statement absent condition. No significant main effects for Model Statement regarding the initial recall emerged in Leal et al. (2018a) (as a result, no means or *d*-scores were reported). The three Veracity X Model Statement interaction effects were not significant, all  $F$ 's < 0.41, all  $p$ 's > .527, which was also the case in Leal et al. (2018a).

Insert Tables 1 and 2 about here

### **Hypotheses Testing**

A 2 (Veracity: truth vs lie) X 2 (Model Statement: present vs absent) MANCOVA was carried out with four dependent variables: the new core and peripheral details in the second recall and the new core and peripheral details in the reverse order recall. Interviewer was the covariate. At a multivariate level, the analysis revealed a significant main effects for Veracity,  $F(4, 99) = 2.75, p = .032, \eta_p^2 = .10$  and Model Statement,  $F(4, 99) = 5.66, p < .001, \eta_p^2 = .19$ . The Veracity X Model Statement interaction effect,  $F(4, 99) = 0.41, p = .798, \eta_p^2 = .02$  was not significant. Leal et al. (2018a) also found significant main effects for Veracity and Model Statement and a non-significant interaction effect.

At a univariate level, one significant Veracity main effect occurred. Truth tellers provided more new peripheral details than liars in the reverse order recall. However, the Bayes Factor only showed weak evidence for this effect, see Table 1. All other effects were

not significant and the Bayes Factors show evidence for the null-hypotheses. This does not replicate Leal et al. (2018a), because they found that truth tellers reported more new core details than liars in the second and reverse order recalls, see Table 1.

At a univariate level, two Model Statement effects occurred. In the Model Statement present condition, more new core details and more new peripheral details were reported in the second recall than in the Model Statement absent condition, see Table 2. This supports Hypothesis 1 and replicates Leal et al. (2018a). The Bayes Factors showed strong evidence for these effects.

We predicted significant Veracity X Model Statement interaction effects for all four dependent variables. Even at a univariate level, none of the interaction effects were significant, all  $F$ 's  $< .48$  and all  $p$ 's  $> .493$ , although the Bayes Factor analysis showed evidence for the effects for the second recall core details ( $BF_{10} = 3.51$ ) and peripheral details ( $BF_{10} = 3.26$ ). Leal et al. (2018a) found one significant interaction effect, for peripheral details in the second recall.

Leal et al. (2018a) carried out follow up tests for all four interactions, despite the absence of significant interaction effects for three of these variables. They argued that relying on the significance of an interaction effect is relying on a  $p$ -value, which provides information about the statistical relevance but not about the practical importance of an effect (Du Prel, Hommel, Röhrig, & Blettner, 2009; Fritz, Morris, & Richler, 2012). Since they were interested in the practical relevance of effects, they compared  $d$ -values between the two Model Statement conditions, because  $d$ -values are indicators of practical relevance (Fritz et al., 2012). We followed Leal et al.'s (2018a) procedure and the results are presented in Table 3.

Insert Table 3 about here

The findings for the Model Statement absent and Model Statement present conditions were similar. In most cases no differences between truth tellers and liars emerged and the Baues Factors showed evidence for the null hypotheses, see Table 3. Also the effect sizes were mostly similar. The only difference emerged for new core details. Truth tellers reported more new core details than liars in the Model Statement absent condition, whereas no significant effect emerged in the Model Statement present condition. The effect size was somewhat more substantial in the Model Statement absent than Model Statement present condition. However, also in the Model Statement absent condition only weak evidence for this effect was found. This means that Hypotheses 2, 3 and 4 have been rejected.

Hypothesis 2 was also rejected in Leal et al. (2018a). They found that truth tellers reported more new core details in the second recall in both Model Statement conditions, with similar effect sizes ( $d = .71$  and  $d = .70$  respectively). Hypothesis 3 was supported in Leal et al. (2018a) because in the second recall, liars reported more new peripheral details than truth tellers, but only in the Model Statement present condition. The effect size was also larger in the Model Statement present condition ( $d = .57$ ) than in the Model Statement absent condition ( $d = .15$ ). Leal et al. (2018a) further found that in the reverse order recall, truth tellers provided more new core details than liars, but only in the Model Statement present condition. However, since the effect sizes were comparable in the Model Statement present ( $d = .68$ ) and Model Statement absent ( $d = .45$ ) conditions, Hypothesis 4 was also rejected in Leal et al. (2018a).

We finally carried out two 2 (Veracity: truth vs lie) X 2 (Model Statement: present vs absent) ANCOVAs with total new details (new core details and new peripheral details combined) in the second recall and reverse order recall as dependent variables. Interviewer was the covariate. Regarding the Veracity factor, a weak effect emerged that truth tellers reported significantly more new total details than liars in the second recall, see Table 1. The

analysis for total new details in the reverse order recall supported the null hypothesis. In Leal et al. (2018a) truth tellers reported more new total details than liars in both second and reverse order recalls, see Table 1.

In the second recall, very strong evidence emerged that interviewees reported more new total details in the Model Statement present than in the Model Statement absent condition, whereas no Model Statement differences (and evidence for the null hypothesis) emerged in the reverse order recall, see Table 2. This was an exact replication of Leal et al. (2018a).

The interaction effects for the new total details in the second recall and reverse order recalls were not significant (both  $F$ 's  $< .40$ , both  $p$ 's  $> .532$ ), which replicates Leal et al. (2018). However, for the reason described above, we –and also Leal et al. (2018a)– examined the Veracity effects for the two Model Statement conditions separately, see Table 3.

Truth tellers reported more new total details than liars in the second recall in the Model Statement absent condition, whereas the effect for second recall in the Model Statement present condition was not significant. Although the effect size was somewhat more substantial in the Model Statement absent than Model Statement present condition, only weak evidence for the effect in the Model Statement absent condition was found. In addition, in both the Model Statement absent and present conditions, the effects for reverse order recall were not significant, with evidence for the null hypothesis emerging. In other words, the findings for the Model Statement absent and present conditions did not differ much from each other. In Leal et al. (2018a) also similar effect sizes for the two Model Statement conditions were obtained, but some significant differences emerged. Truth tellers reported more new total details than liars in the second recall in the Model Statement absent condition and in the reverse order recall in the Model Statement present condition, see Table 3.

## Discussion

### Veracity Main Effects

Replicating Leal et al. (2018a), truth tellers reported more core, peripheral and total details than liars in the initial recall. This supports previous deception research, mainly carried out in North America and Western Europe, that truth tellers typically report more details than liars (Amado et al., 2015). It also replicates the findings of the only previous deception study we are aware of carried out with Israeli Arab participants published to date (Leal et al., 2018b), where it has been found that truth tellers reported more details than liars. The two studies together thus suggest that the typical finding that truth tellers report more details than liars can be generalised to Arabs living in Israel.

Leal et al. (2018b) found that, regardless of their veracity, Arab participants (living in Israel) reported fewer details than British participants. When we compare the results of the current experiment with those of Leal et al. (2018a) we see the same pattern emerging (truth tellers and liars reported an average of 78.78 and 52.63 details respectively in the initial recall). Leal et al. (2018b) explained differences in reporting details between British and Arab participants in terms of differences in communication style in British and Arab cultures (Liu, 2016). The British culture is characterised as a low-context communication culture and the Arab culture as a high-context communication culture (Copeland & Briggs, 1986). High-context and low-context cultures (Hall, 1976) are terms used to describe how much the context means in the exchange of information. Messages exchanged in high-context cultures carry implicit meanings and rely heavily on context: Many things are left unsaid, letting the culture explain (Hall, 1976). Word choice becomes important, since a few words can communicate a complex message effectively to an in-group member. In contrast, low-context cultures rely on explicit verbal communication: Communicators should become explicit to be fully understood. This implies that interviewees in low-context cultures (British

participants) provide more information than interviewees in high-context cultures (Arab participants).

In the second and reverse order recalls, one significant difference emerged in the present experiment: A weak effect emerged that truth tellers reported more new peripheral details than liars in the reverse order recall. In contrast, no significant differences regarding peripheral details emerged in Leal et al. (2018a). It is striking how few peripheral details liars reported in the current experiment compared to Leal et al. (2018a). In the current experiment, liars reported an average of 8.21 peripheral details across the three phases of the interview compared to an average of 31.95 in Leal et al. (2018a), more than four times as many. New peripheral details in the reverse order recall were scarce amongst truth tellers ( $M = 2.34$ ) but virtually absent in liars ( $M = 0.94$ ). The significant difference was thus the result of the virtual absence of such details in liars rather than truth tellers reporting many of them. We can only speculate why liars reported so few peripheral details in the current experiment. While running the experiment, many Arab participants mentioned that security in Israel is substantial. The Arab participants mentioned that they are frequently questioned in security and investigative settings. Arabs living in Israel may therefore have greater experience than their British counterparts regarding the type of information that is expected of them in interviews and may have discovered that reporting peripheral details does not contribute towards making a convincing impression. Future research is required to test this speculation, but if true, the present findings could be specific to Arabs living in Israel and can perhaps not be generalised to Arabs living elsewhere.

Leal et al. (2018a) found that truth tellers reported more new core details than liars in both the second recall and the reverse order recall. In the present experiment, no Veracity differences emerged for core details in these two recall attempts. The difference in findings for core details between the current experiment and Leal et al. (2018a) may be related to the

number of core details added in the second and reverse order recalls, particularly by truth tellers. In the present study truth tellers added in the second and reverse order recalls, roughly half of the number of core details ( $M = 25.32$ ) that were added by truth tellers ( $M = 51.22$ ) in Leal et al. (2018a). The difference is less substantial for liars (18.43 vs 25.42 new core details). The differences between truth tellers and liars in reporting new core details was thus more pronounced in Leal et al. (2018a) than in the current experiment, mainly caused by truth tellers adding more core details in Leal et al. (2018a). If truth tellers do not add much information, liars have a higher chance to match the number of details truth tellers add. Again, we can only speculate why truth tellers in the present experiment added relatively few core details in the secondary and reverse order recalls compared to truth tellers in Leal et al. (2018a). If it is true that many Arabs have experience with security and investigative interviews, they may know better than their British counterparts how much information is required from them in the initial recalls. They thus volunteer more information than British participants in the initial recall, resulting in less information to add in subsequent recalls. Again, this explanation requires further examination, but, if true, the findings could be specific to Arabs living in Israel and perhaps they cannot be generalised to Arabs living elsewhere.

### **Model Statement Main Effects**

The Model Statement main effects were identical in the current experiment and in Leal et al. (2018a). The Model Statement present condition resulted in more new core and new peripheral details in the second recall than the Model Statement absent condition. This eliciting information effect, found in all deception Model Statements studies to date carried out in Western Europe (Vrij et al., 2018a), was thus replicated with an Arab sample. Replicating Leal et al. (2018a), the Model Statement had no effect on the amount of detail elicited from the reverse order question. Leal et al. (2018a) gave four reasons for this absence

of an effect. By the time the reverse order was asked, participants had already reported their stories twice. This may have resulted in (1) a lack of motivation to tell the story again, or (2) saturation in terms of what they could further report. In addition, (3) perhaps the effect of a Model Statement does not last long in an interview, or (4) since a reverse order recall is mentally taxing (Vrij et al., 2008), interviewees found it perhaps too difficult to provide long responses.

### **Veracity x Model Statement Interaction Effects**

Although in Leal et al. (2018a) the Model Statement was successful in eliciting a cue to deceit (peripheral details), such success was not obtained in the current study. In fact, the Model Statement absent condition elicited a weak verbal cue to deceit (new core details in second recall) whereas the Model Statement present condition did not reveal cues to deceit.

We cannot rule out that the absence of a replication was caused by a lack of power. It has been suggested that an adequately powered replication study should contain a sample size 2.5 times the original sample size (Simonsohn, 2015). Following this logic, the sample size should have been 300 in the current study, an ambitious sample size in a cross-cultural context. Of course, there is no guarantee that the increased sample size would have led to a replication of Leal et al.'s (2018a) interaction effects.

The absence of a positive effect of the Model Statement in terms of eliciting cues to deceit raises questions about the usefulness of the Model Statement tool. The Model Statement tool is not just a lie detection tool, it also aims to elicit more information from interviewees. Eliciting as much information as possible is a main aim in investigative interviews (Fisher, 2010; Vrij, Hope, & Fisher, 2014) From that perspective, the tool was successful in the current experiment, as it was successful in every other deception study in which it has been examined (Vrij et al., 2018a). From a lie detection perspective, results are less straightforward. Research has shown that a Model Statement does not make total details

a cues to deceit, because truth tellers and liars tend to report the same amount of additional details after listening to a Model Statement (Vrij et al., 2018a). However, research has revealed veracity differences in the quality of the statement as differences emerged in plausibility, complications and core/peripheral details (Vrij et al., 2018a). Research examining differences in the quality of statements is only in its initial stage and more work is required before a full picture emerges. The current experiment demonstrates that in this search of verbal cues to deceit, cross-cultural variety should be taken into account.

### **Acknowledgement**

This work was funded by the Centre for Research and Evidence on Security Threats (ESRC Award: ES/N009614/1)

### **Author Contributions**

The first and second authors designed the experiment and wrote the article together. The second and fifth authors carried out the statistical analyses. The third and fourth authors collected the data. The sixth author commented on a draft version of the article, and directed the project that was conducted in her research laboratory, with the assistance of the seventh author.

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Accepted Article

Table 1

*Total (New) Details, (New) Core Details, and (New) Peripheral Details in the Three Recalls as a Function of Veracity in the Current Study and in Leal et al.'s Study (2018a)*

	Truth (n = 53)		Lie (n = 54)		<i>F</i>	<i>p</i>	Cohen's <i>d</i>		<b>BF</b> <sub>10</sub>	Leal et al. (2018a)	
	<i>M (SD)</i>	95% CI	<i>M (SD)</i>	95% CI			<i>d</i>	95% CI		Pattern	Cohen's <i>d</i>
Core details in initial recall	43.68 (32.25)	[37.22, 50.35]	27.67 (15.20)	[20.86, 33.88]	12.40	.001	0.64	[0.24, 1.02]	22.73	T > L	<b>0.99</b>
Peripheral details in initial recall	08.34 (11.09)	[06.22, 10.74]	03.57 (05.10)	[01.31, 05.79]	09.45	.003	0.55	[0.16, 0.93]	07.93	L > T	0.29
Total number of details in initial recall	52.02 (36.35)	[45.02, 59.51]	31.24 (15.41)	[23.74, 38.10]	17.22	<.001	0.75	[0.34, 1.13]	121.91	T > L	<b>0.74</b>
New core details in second recall	20.38 (18.35)	[15.92, 24.98]	14.30 (15.56)	[10.04, 18.99]	03.42	.067	0.36	[-.03, 0.73]	00.93	T > L	<b>0.52</b>
New peripheral details in second recall	05.85 (09.14)	[04.00, 08.02]	03.70 (06.64)	[01.72, 05.70]	02.60	.110	0.27	[-.12, 0.65]	00.49	L > T	0.27
New core details in reverse order recall	04.94 (07.20)	[03.11, 06.83]	04.13 (06.45)	[02.33, 06.01]	00.37	.547	0.12	[-.26, 0.50]	00.24	T > L	<b>0.57</b>
New peripheral details in reverse order recall	02.34 (04.16)	[01.46, 03.21]	00.94 (01.83)	[00.09, 01.82]	04.97	.028	0.44	[0.05, 0.81]	01.92	L > T	0.18
Total new details in second recall	26.23 (20.89)	[21.50, 31.41]	18.00 (17.54)	[13.30, 23.11]	05.51	.021	0.43	[0.04, 0.80]	01.76	T > L	<b>0.38</b>
Total new details in reverse order recall	07.28 (09.03)	[05.09, 09.53]	05.07 (07.27)	[02.93, 07.32]	01.92	.169	0.27	[-.11, 0.65]	00.49	T > L	<b>0.39</b>

Table 2

*Total (New) Details, (New) Core Details, and (New) Peripheral Details in the Three Recalls as a Function of Model Statement in the Current Study and in Leal et al. 's Study (2018a)*

	Model statement absent (n = 55)		Model statement present (n = 52)		<i>F</i>	<i>p</i>	Cohen's <i>d</i>		<b>BF</b> <sub>10</sub>	Leal et al. (2018a)	
	<i>M</i> ( <i>SD</i> )	95% CI	<i>M</i> ( <i>SD</i> )	95% CI			<i>d</i>	95% CI		Pattern	Cohen's <i>d</i>
Core details in initial recall	41.33 (31.70)	[32.86, 46.18]	29.54 (17.27)	[24.77, 38.50]	02.50	.117	0.46	[0.07, 0.84]	02.43		
Peripheral details in initial recall	04.85 (08.13)	[01.71, 06.30]	07.08 (09.58)	[05.66, 10.38]	05.50	.021	0.25	[-0.13, 0.63]	00.43		
Total number of details in initial recall	46.18 (35.19)	[36.18, 50.87]	36.61 (21.48)	[32.08, 47.23]	00.49	.484	0.33	[-.06, 0.70]	00.72		
New core details in second recall	13.18 (15.96)	[08.50, 17.70]	21.67 (17.52)	[17.10, 26.58]	06.46	.013	0.51	[0.11, 0.88]	04.20	MS > C	<b>0.96</b>
New peripheral details in second recall	02.71 (05.29)	[-0.23, 03.85]	06.94 (09.71)	[05.81, 10.01]	16.04	< .001	0.55	[0.15, 0.92]	06.66	MS > C	<b>0.57</b>
New core details in reverse order recall	03.36 (04.29)	[01.49, 05.26]	06.77 (08.60)	[03.82, 07.71]	02.86	.094	0.51	[0.11, 0.88]	00.93	MS > C	0.07
New peripheral details in reverse order recall	01.29 (02.60)	[00.52, 02.29]	02.00 (03.83)	[00.97, 02.80]	00.53	.468	0.22	[-0.17, 0.59]	00.49	MS > C	0.18
Total new details in second recall	15.89 (16.49)	[09.89, 19.94]	28.62 (20.68)	[24.57, 34.93]	15.59	< .001	0.68	[0.28, 1.06]	44.26	MS > C	<b>1.11</b>
Total new details in reverse order recall	04.65 (05.74)	[02.53, 07.03]	07.77 (10.04)	[05.33, 09.97]	02.90	.092	0.38	[0.00, 0.76]	01.17	MS > C	0.11

Table 3

*Total (New) Details, (New) Core Details, and (New) Peripheral Details in the Three Recalls as a Function of Veracity and Model Statement in the Current Study and in Leal et al.'s Study (2018a)*

	Truth (n = 27)		Lie (n = 28)		<i>F</i>	<i>p</i>	Cohen's <i>d</i>		<b>BF</b> <sub>10</sub>	Leal et al. (2018a)	
	<i>M</i> ( <i>SD</i> )	95% CI	<i>M</i> ( <i>SD</i> )	95% CI			<i>d</i>	95% CI		Pattern	Cohen's <i>d</i>
<b>Model statement absent</b>											
New core details in second recall	17.66 (19.80)	[11.72, 23.71]	08.86 (09.61)	[02.93, 14.70]	04.52	.038	0.57	[0.02, 1.10]	01.67	T > L	<b>0.71</b>
New peripheral details in second recall	03.44 (06.69)	[01.64, 05.37]	02.00 (03.45)	[00.11, 03.77]	01.44	.235	0.27	[-.26, 0.80]	00.42	T > L	0.15
New core details in reverse order recall	03.63 (05.15)	[01.94, 05.30]	03.11 (03.34)	[01.47, 04.77]	00.19	.668	0.12	[-.41, 0.65]	00.30	T > L	0.45
New peripheral details in reverse order recall	01.75 (03.22)	[00.73, 02.74]	00.86 (01.78)	[-0.12, 01.85]	01.54	.220	0.34	[-.19, 0.87]	00.53	L > T	0.09
Total new details in second recall	21.11 (20.20)	[15.26, 27.18]	10.86 (09.86)	[04.91, 16.61]	06.32	.015	0.65	[0.10, 1.18]	02.82	T > L	<b>0.68</b>
Total new details in reverse order recall	05.37 (06.79)	[03.13, 07.59]	03.96 (04.53)	[01.79, 06.20]	00.78	.381	0.25	[-.29, 0.77]	00.38	T > L	0.30
<b>Model statement present</b>											
	<b>Truth (n = 26)</b>		<b>Lie (n = 26)</b>								
New core details in second recall	23.19 (16.62)	[16.09, 29.98]	20.15 (18.57)	[13.37, 27.26]	00.31	.581	0.17	[-.37, 0.71]	00.33	T > L	<b>0.70</b>
New peripheral details in second recall	08.35 (10.70)	[05.00, 12.15]	05.54 (08.59)	[01.74, 08.88]	01.69	.200	0.29	[-.26, 0.83]	00.44	L > T	<b>0.57</b>
New core details in reverse order recall	06.31 (08.74)	[02.90, 09.79]	05.23 (08.59)	[01.75, 08.64]	00.23	.636	0.12	[-.42, 0.67]	00.30	T > L	<b>0.68</b>
New peripheral details in reverse order recall	02.96 (04.94)	[01.45, 04.42]	01.04 (01.91)	[-0.42, 02.55]	03.21	.079	0.51	[-.05, 1.06]	01.18	T > L	0.04
Total new details in second recall	31.54 (20.63)	[23.38, 39.83]	25.69 (20.71)	[17.40, 33.85]	01.07	.307	0.28	[-.27, 0.82]	00.43	T > L	0.47
Total new details in reverse order recall	09.27 (10.66)	[05.29, 13.28]	07.77 (10.04)	[02.26, 10.25]	01.16	.286	0.14	[-.40, 0.69]	00.45	T > L	<b>0.56</b>