Fading Lies: Applying the Verifiability Approach after a Period of Delay

Louise Marie Jupe*

Aldert Vrij

Sharon Leal

Department of Psychology, University of Portsmouth, UK

Galit Nahari

Department of Criminology. Bar-Ilan University, Israel

Author Note

This work was funded by the Centre for Research and Evidence on Security Threats (ESRC Award: ES/N009614/1). We would like to thank Celaine Cooper, Laura Gill, Jemimah Makanani and Abigail Preen for assistance with data collection.

**Address for correspondence*: Louise Jupe, Department of Psychology, University of Portsmouth, King Henry Building, King Henry I Street, Portsmouth, PO1 2DY. UK. louise.jupe@port.ac.uk. T: +44 2392 84661

Abstract

We tested the utility of applying the Verifiability Approach (VA) to witness statements after a period of delay. The delay factor is important to consider because interviewees are often not interviewed directly after witnessing an event. A total of 64 liars partook in a mock crime and then lied about it during an interview, seven days later. Truth tellers (n = 78) partook in activities of their own choosing and told the truth about it during their interview, seven days later. All participants were split into three groups, which provided three different verbal instructions relating to the interviewer's aim to assess the statements for the inclusion of verifiable information: no information protocol (IP) (n = 43), the standard-IP (n = 46) and an enhanced-IP (n = 53). In addition to the standard VA approach of analysing verifiable details, we further examined verifiable witness information and verifiable digital information and made a distinction between verifiable details and verifiable sources. We found that truth tellers reported more verifiable digital details and sources than liars.

Keywords: deception, verifiability approach, investigative interviews, delay

Fading Lies: Applying the Verifiability Approach after a Period of Delay

One of interviewees' primary concerns in an investigative interview is to make sure that their testimony is believed. However, the way in which truth tellers and liars approach this will differ. Truth tellers typically employ a 'tell it all' approach (Hartwig, Granhag, & Strömwall, 2007). Cognitive and social reasons typically refrain truth tellers from reporting all they know spontaneously, but they are able to give more complete and accurate accounts when specific prompts are used in the interview (Vrij et al., 2017; Vrij, Hope, & Fisher, 2014). A liar's aim is to appear credible whilst not having their dishonesty identified (Leins, Fisher, & Ross, 2013). Research has often highlighted that stories rich in detail are more likely to be associated with credibility (Bell & Loftus, 1989; Vrij, 2008), and as such liars are likely to be motivated to provide lots of details (Hartwig et al., 2007). Liars are then faced with an information management dilemma (liars dilemma hypothesis; Nahari, 2018). They know that if they provide too much information, they may incriminate themselves and their deception will be discovered (Masip & Herrero, 2013). A solution to this problem is to provide lots of details that cannot be checked by an investigator, whilst withholding information that can be checked. The Verifiability Approach (VA), introduced by Nahari, Vrij, & Fisher (2014a), is a strategy-based verbal veracity tool which works by manipulating the predicament faced by liars who are required to provide verbal statements. The VA works on the premise that truth tellers will provide more verifiable information (information that can be checked by investigators) than liars, whereas liars will provide more unverifiable information than truth tellers.

The current literature on the VA is promising (Nahari, 2018; Vrij & Nahari, 2019). It has predominantly shown that truth tellers provide more verifiable information than liars (Nahari et al., 2014a; 2014b), whilst liars typically provide more unverifiable information than truth tellers

(Vrij & Nahari, 2019). The effect becomes stronger when an information protocol (IP) is introduced – informing interviewees that the investigator will check the statement for the occurrence of verifiable details – as it has led truth tellers, but not liars, to report more verifiable details (Harvey, Vrij, Nahari, & Ludwig, 2017; Nahari, Vrij, et al., 2014b). The VA has been applied in five settings to date: Police interrogation (e.g., Nahari & Vrij, 2014, 2015, Nahari et al., 2014a, 2014b); insurance (Harvey, Vrij, Leal, Lafferty, & Nahari, 2017; Harvey, Vrij, Nahari, et al., 2017; Nahari, Leal et al., 2014; Vrij, Nahari, Isitt, & Leal, 2016); malingering (Boskovic, Bogaard, Merckelbach, Vrij, & Hope, 2017; Boskovic, Gallardo, Vrij, Hope, & Merckelbach, 2018)) an airport setting (Jupe, Leal, Vrij, & Nahari, 2017) and occupation (Jupe, Vrij, Leal, Mann, & Nahari, 2016). The only study in which no differences were found for verifiable or unverifiable detail was when it was applied to an occupation/identity setting (Jupe et al., 2016). However, it was noted that the data was not obtained with the specific aim of applying the VA. Specifically, lies told about occupation/identity may differ from those told within a criminal setting (see Jupe, Vrij, Leal, & Nahari, 2018). For a detailed review of the VA see Nahari (2018a) and Vrij and Nahari (2019).

The current study also applies the VA to a police interrogation setting. There are several innovative elements. First, it introduces a 7-day delay between an event and the interview about the event. This makes the study a closer representative of real-life interviews where people are often interviewed after a delay. The seven-day delay may affect how truth tellers and liars respond to questioning, which makes it premature to generalise the findings for the VA obtained to date to situations in which there is a delay between event and interviews. By examining the delay, we are able to ascertain if the VA is still applicable in delay situations. This may be of particular importance to truth tellers who are not aware about the importance of reporting

verifiable details. Truth tellers are likely to not have the same motivation as liars to think about details pertaining to an event they may be questioned about (Gilovich, Medvec, & Savitsky, 1998; Granhag & Hartwig, 2008; Savitsky & Gilovich, 2003). Reporting relatively few verifiable details could make such truth tellers sound more like liars.

A second innovative part of the study is that some participants were informed about the working of the VA just after the event (seven days before the interview) through the IP. This is also a realistic element because once the VA is introduced in real life investigations, some interviewees will become aware of this method. Will liars be able to fool the VA method if they know how it works, especially when they are given one week to prepare their stories? Fooling the VA method would be making up verifiable details through bluffing. To avoid bluffing, a stronger IP might be needed than used in the VA studies to date. Therefore, in the current study, we introduced two IP conditions: One in which the standard-IP was used as per previous studies (Harvey et al., 2017; Nahari et al, 2014b), and one in which an enhanced-IP was introduced. The standard-IP informs interviewees that an investigator will listen for the inclusion of verifiable details, whilst in the enhanced-IP, interviewees will not only be informed that an investigator will listen for the inclusion of verifiable details, but also that after their statement the investigator might ask for more information on the verifiable details provided. It is hoped that this stronger IP will change the interviewees' assumption from where the investigator will just listen to where they may ask further questions. Perhaps this stronger IP will discourage liars from bluffing, thus magnifying the differences between liars and truth tellers. The VA states that activities are verifiable when they i) are *carried out* with or ii) are *witnessed by* named persons or persons who can be identified based on the description given; iii) the interviewee believes may have been captured on Close-Circuit Television (CCTV) or iv) were documented or recorded in ways other

than through CCTV (such as using debit cards, mobile phones, or computers, noting attendance on a class register). When liars want to bluff, it may be easier to state that they were with a friend or were witnessed by a friend than to state that there is CCTV or digital evidence, because asking a friend to collaborate is easier than falsifying digital information. In addition, in the absence of digital information, liars may turn to alibi witnesses to provide verifiable information to their accounts.

In typical VA research, verifiable details are counted. In the current experiment, we also counted verifiable sources. This is interesting from an applied perspective. In real life, investigators will not be able to keep up with the number of verifiable details someone provides in real time, but they may be able to notice the presence or absence of verifiable source in real time. Thus, if research shows that verifiable sources discriminate truth tellers from liars, it would be an important step forward in making the VA applicable to many real-life situations. Since verifiable details and verifiable sources are related to each other, we expect similar findings for these two concepts. The concept 'verifiable sources' has been introduced before and with success: Truth tellers report more verifiable sources than liars (Leal et al., 2018). This is the first study in which the diagnostic value of verifiable sources and verifiable details were compared.

We formulated the following hypotheses. Truth tellers will provide significantly more verifiable details than liars, particularly those related to digital information (Hypothesis 1a) and significantly more verifiable sources than liars, particularly those related to digital information (Hypothesis 1b) (Veracity main effect). Liars will provide significantly more unverifiable details than truth tellers (Hypothesis 2, Veracity main effect). The standard-IP may result in liars bluffing about witness sources in particular; and not informing truth tellers about the working of the VA in advance may make them to forget verifiable details. We thus predicted that the ability

of the VA to discriminate between truth tellers and liars will be the strongest in the enhanced-IP condition, particularly for digital verifiable details and sources and the weakest in the no-IP condition (Veracity x Information Protocol interaction effect) (Hypothesis 3).

Method

Participants

Power analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007), for ANOVA with fixed effects, special, main effects and interactions with a large effect size assumption of $f = 0.5$ and an alpha of 0.05, for six groups, indicated a sample size of 107 (thus, 17 per cell) would be sufficient for a power of 0.95 (Cohen, 1992). A total of 152 participants were recruited. Three participants were removed for not following instructions, whilst seven participants were removed due to incomplete data leaving a total of 142 participants (64 liars and 78 truth tellers) Those recruited were from university staff ($n = 19$), students and postgraduates ($n = 119$) and other members of the research community ($n = 4$). The participants were comprised of 100 females and 42 males, with ages ranging from 18 to 69 years ($M = 23.66$, $SD = 7.85$).

Ethics

The current research was approved by the Science Ethics Committee from the university where the research was carried out and by the Ethics Committee of the Research Centre that funded the research.

Design

The study used a 2 (Veracity: lie versus truth) x 3 (IP: no-IP versus standard-IP versus enhanced-IP) between-subjects design with *verifiable details*, *unverifiable details, verifiable witness details, verifiable digital details, verifiable sources, verifiable witness sources* and *verifiable digital sources* as dependent variables.

Procedure

Participants were recruited via internal advertising, university webpages and online participant pool. Participants were informed that it would be a lie detection study, including an event and an interview over two sessions, seven days apart, and that they would be paid £10 for their participation. They were also informed that they may be asked to lie. Participants who wished to participate were sent further information regarding the study via email and times arranged for their attendance.

Session one.

Upon arrival at the Psychology department, participants were asked to read a participant information sheet and asked if they had any queries. They were then asked to sign a consent form. Participants were then randomly assigned to one of the two veracity conditions.

Truth tellers were told that their mission was to partake in activities of their own choosing for 30 minutes. They were asked to carry out more than one activity in more than one location. They were also asked not to do anything that they would feel uncomfortable discussing later. They were asked to return after 30 minutes. They were then free to leave the department.

Liars were briefed about their mission which would involve a theft. The individual was provided with a detailed mission sheet with instructions inside of an envelope. The individual was to leave the research cubicle, taking an envelope addressed to ‘Dr. Ellison’. They were to head to the Psychology administration office where they were to locate Dr. Ellison’s mailbox. Inside of this mailbox they would find an envelope which was labelled ‘Top Secret’. They were to place the envelope they were provided with into the mailbox, whilst taking the ‘Top Secret’ envelope. Inside the envelope was a key and a room number. They were to locate the room, unlock the door and enter the room. Inside the room, they were to log onto the computer (using

their student or staff account) and insert the USB file into the drive and locate a specific file. They were to then log into a provided email account, via the internet. They were then to email the file, located on the USB stick, to a specific email address provided in the instructions, with the subject 'Secret Agent'. They were then to close the email account and log off from the computer. They were then asked to close and lock the door and head back to the experimenter and hand them the envelope with the key and the USB. The experimenter then left the room and checked to make sure that the file had been received in the 'assailant' email account.

Upon arrival back at the department, non-IP truth tellers (n = 24) were informed of the following; *'During the last 30 minutes, there has been a theft from within the admin office in the Psychology department. As you were not with myself or a colleague at the time of the theft, you now become a suspect. Next week when you return, we will be interviewing you about your whereabouts over the last 30 minutes'.* A suitable time slot seven days later was then arranged with the participant. They were also asked to refrain from talking to anybody about the study, thanked for their time and were free to leave.

In addition to the information regarding the left, standard-IP truth tellers (n = 27) were given a laminated sheet, with the following information which the experimenter also read aloud. *'The investigator will listen to your statement carefully and will check if the details provided could be verified. Verifiable details are: Activities i) carried out with or ii) witnessed by named persons or persons who can be identified based on the description given; iii) Activities that the interviewee believes may have been captured on CCTV; iv) activities that were documented or recorded* in ways *other than through CCTV (such as, using debit cards, mobile phones, or computers, noting attendance on a class register)'*. A suitable time slot seven days later was then

arranged with the participant. They were also asked to refrain from talking to anybody about the study, thanked for their time and were free to leave.

Truth tellers (n = 27) in the enhanced-IP condition, were given the exact same instructions as the standard-IP truth tellers, however their verbal instruction contained the following addition: *The investigator might then ask further questions about the verifiable details that you may provide.'*

Upon arrival back at the department, non-IP liars (n = 19) were informed of the following; '*During the last 30 minutes, there has been a theft from within the admin office in the Psychology department. As you were not with myself or a colleague at the time of the theft, you now become a suspect. Next week when you return, we will be interviewing you about your whereabouts over the last 30 minutes. However, when you are interviewed by the investigator you are to lie and use the alibi that you spent 30 minutes partaking in activities of your own choosing*.' A suitable time slot seven days later was then arranged with the participant. They were also asked to refrain from talking to anybody about the study, thanked for their time and were free to leave. Standard-IP liars *(n* = 20) were provided with the same additional information regarding verifiable details as standard-IP truth tellers, and liars (n = 26) in the enhanced-IP condition were provided with the same additional information regarding verifiable details as enhanced-IP truth tellers.

Session two.

Upon arrival at the Psychology department for their second session, participants were asked to again familiarise themselves with the participant information sheet and to ask any questions that they may have.

Lying and truth telling participants in the no-IP condition were provided with the following information: *'As you are aware, last week there was a theft of a data stick from the administration office within the Psychology department. As you were not with myself or my colleagues at the time of the theft, you are a suspect and have returned to be interviewed about your whereabouts during the time of the theft'.*

Lying and truth telling participants in the standard-IP condition were provided with the additional following information on a laminated sheet which the experimenter also read aloud: '*I'd like to remind you of what the investigator will be looking for during the interview. The investigator will listen to your statement carefully and will check if the details provided could be verified. Verifiable details are: Activities i) carried out with or ii) witnessed by named persons or persons who can be identified based on the description given; iii) Activities that the interviewee believes may have been captured on CCTV; iv) activities that were documented or recorded in ways other than through CCTV (such as, using debit cards, mobile phones, or computers, noting attendance on a class register).*

Lying and truth telling participants in the enhanced-IP condition were provided with the same information on a laminated sheet which the experimenter also read aloud as in the standard-IP condition but with the following addition: *The investigator might then ask further questions about the verifiable details that you may provide.'*

To increase motivation to appear convincing, all participants were also told the following: '*It is important that you try to be as convincing as possibly during your interview. If you are convincing and the investigator believes you, you will be entered into the prize draw. However, if the investigator does not believe you, you will be asked to provide a written statement of your whereabouts during the time of the theft'.*

All participants were then asked if they required preparation time before their interview and were allowed as much time as they required. When they were ready, they were given a pre-interview questionnaire. The pre-interview questionnaire gathered basic demographic information about the participants including gender, age and student/staff status. It also asked participants to rate on a 7-point Likert scale how well they thought they were prepared for the interview (from [1] extremely unprepared to [7] extremely prepared).

After completion of the pre-interview questionnaire, participants were taken to be interviewed. The interviewer was a research assistant and was blind to the veracity status of the participants. All participants were asked the same question during the interview: '*Seven days ago on [date] at [time] a USB stick with a confidential file was taken from the administration office, here in the King Henry Building. This file was then emailed to an unknown assailant. As you were not with my colleagues at the time of the theft, you are a suspect. It is my job to ascertain if you were responsible for the theft of the data. Do you understand? Please tell me, in as much detail as possible, what you were doing for the 30 minutes' time period during which time the USB was stolen. Please note that this is the only question I will ask and therefore it is advisable to include as much information as you can remember.'*

After the interview, participants were asked to complete a post-interview questionnaire. All participants were asked to rate on a 7-point Likert scale how motivated they were to perform well during the interview (from [1] extremely unmotivated to [7] extremely motivated). Participates were asked to rate their overall truthfulness within the interview on a scale from 0% to 100% in 10% increments. Participants were also asked to rate on a 7-point Likert scale to what extent they were motivated to provide verifiable details within their interview (from [1] extremely unmotivated to [7] extremely motivated) and the extent to which they were motivated

to provide unverifiable details (from [1] extremely unmotivated to [7] extremely motivated). Participants were also asked if they bluffed ('yes/no', provide 'false' verifiable information) and if so, to rate on a 7-point Likert scale to what extent they bluffed (from [1] never to [7] all the time]. Participants were also asked to rate on a 7-point Likert scale to what extent they believed that their statements verifiable details would be analysed and used in making a veracity decision (from [1] extremely unlikely to [7] extremely likely). After completion of the post-interview questionnaire, participants were given a debrief sheet and given the chance to ask any questions. Participants were thanked and paid for their participation.

Verifiable Detail Coding

The statements were coded by one rater, blind to the veracity status of each participant. The rater coded all occurrences of verifiable details. Verifiable details were activities which were i) carried out with or ii) witnessed by named persons or persons who can be identified based on the description given; iii) activities that the interviewee believes may have been captured on CCTV; iv) activities that were documented or recorded in ways other than through CCTV (such as, using debit cards, mobile phones, or computers, noting attendance on a class register).

Each statement therefore consisted of a total number of verifiable details and a total number of non-verifiable details. A second rater, also blind to the veracity status of the statements, coded a random 18%, (n = 26), for verifiable and unverifiable details. The inter-rater reliability scores were high: verifiable detail [ICC] = .818 and non-verifiable detail [ICC] = .936.

We then calculated and combined the number of verifiable details which related to i) carried out with or ii) witnessed by named persons or persons who can be identified based on the description given giving us our verifiable witness details variable (witness details); and the number of verifiable details which related to iii) activities that the interviewee believes may have

been captured on CCTV; iv) activities that were documented or recorded in ways other than through CCTV (such as, using debit cards, mobile phones, or computers, noting attendance on a class register) (digital details). We also categorised as present or absent, witness sources and digital sources. Thus, in the statement '…I smoked a cigarette and sat on a bench…' four pieces of information are coded (underlined). These details are deemed unverifiable. However, in the statement 'In the shop I saw Mike Jameson' are two pieces of information that can be verified (both witness details, underlined). In addition, Mike Jameson is a verifiable witness source. We did not use frequency coding for the sources because we wanted to use a method which would be easier to listen to in 'real-time' and therefore make it more applicable to real world settings. We added the two absent/present variables together for total verifiable sources; the answer ~~frequency~~ could range from zero to two.

Results

Pre-interview Questionnaire

Preparation.

Participants reported to be highly prepared for the interview (M = 5.11, SD = 1.18, 95% CI [4.92, 5.31] on a 7-point Likert scale). A 2 (Veracity: truth vs. lie) x 3 (Information Protocol: no-IP versus standard-IP versus enhanced-IP) between-subjects ANOVA[1] was conducted with how they rated their preparation prior to interview as the dependent variable. The ANOVA revealed a significant main effect for Veracity, with truth tellers (M = 5.40, SD = 1.08, 95% CI [5.14, 5.66]) rating their level of preparation for the interview as higher than liars (M = 4.76, SD = 1.21, 95% CI [4.49, 5.07]) $F(1, 136) = 9.963$, $p = .002$, $\eta_p^2 = .068$, $d = .56$. The main effect for

[1] All ANOVA's in the current paper were subjected to Bonferroni adjustments.

Information Protocol was not significant, $F(2, 136) = .144$, $p = .866$, $\eta_p^2 = .002$, nor was the Veracity X Information Protocol interaction $F(2, 136) = .265$, $p = .767$, $\eta_p^2 = .004$.

Post-interview Questionnaire

Manipulation checks.

Veracity manipulation check.

Truth tellers reported that they were significantly more truthful in their statements (M = 93.20%, SD = 15.74%, 95% CI [89.37%, 96.37%] on a 11-point Likert scale) than liars (M = 25.15%, SD = 28.78%, 95% CI [24.07%, 32.39%], $t(140) = 17.88$, $p < 0.001$, $d = 2.93$. This supports the validity of the veracity manipulation.

Information protocol manipulation check.

A one-way ANOVA with Information Protocol (no-IP, standard-IP and enhanced-IP) factor and the extent to which participants believed that their statements would be checked for verifiable details revealed a significant main effect, $F(2, 139) = 2.907$, $p = .029$, $\eta_p^2 = .040$. Pairwise comparisons revealed that participants in the standard-IP condition rated their belief that their statements would be checked for verifiable details ($M = 4.82$, $SD = 1.63$, 95% CI [4.32, 5.29]) as higher than those in the no-IP condition ($M = 4.02$, $SD = 1.55$, 95% CI [3.61, 4.48]), $p = 0.31$, $d = .50$. There was no significant difference between the no-IP and enhanced-IP conditions ($M = 4.60$, $SD = 1.65$, 95% CI [4.23, 4.76]), $p = .248$ nor between the standard-IP and the enhanced-IP conditions, $p = 1.00$.

Motivation and provision of verifiable and unverifiable detail.

The reported motivation of the participants to be convincing during the interview was high ($M = 5.82$, $SD = .98$, 95% CI [5.67. 5.99] on a 7-point Likert scale). The reported motivation of the participants to provide verifiable details was high ($M = 5.52$, $SD = 1.25$, 95%

CI [5.30, 5.73] on a 7-point Likert scale). The reported motivation of the participants to provide unverifiable details during the interview was medium (M = 4.22, SD = 5.53, 95% CI [3.57, 5.30] on a 7-point Likert scale).

A 2 (Veracity: truth vs. lie) x 3 (Information Protocol: no-IP versus standard-IP versus enhanced-IP) between-subjects MANOVA was conducted with (i) motivation to perform well during the interview, (ii) motivation to provide verifiable details and (iii) motivation to provide unverifiable details as the dependent variables. The MANOVA revealed a significant main effect for Veracity, Wilks' $\lambda = .911$, $F(3, 134) = 4.373$, $p = .006$, $\eta_p^2 = .089$. The main effect for Information Protocol was not significant, Wilks' $\lambda = .948$, $F(6, 268) = 1.205$, $p = .304$, $\eta_p^2 = .026$, nor was the Veracity X Information Protocol interaction effect, Wilks' $\lambda = .973$, $F(6, 268) = .723$, $p = .723$, $\eta_p^2 = .013$. Univariate effects for Veracity showed that truth tellers rated their motivation to provide verifiable details (M = 5.85, SD = .14, 95% CI [5.58, 6.12]) as higher than liars (M = 5.10, SD = .15, 95% CI [4.81, 5.41]), $F(1, 136) = 13.29$, $p < .001$, $\eta_p^2 = .089$, $d = 5.16$. The other two univariate main effects for Veracity were not significant, both F's < 13.285, both p's > .107.

Hypothesis Testing

Seven ANOVA's were conducted following a 2 (Veracity: truth vs. lie) x 3 (Information Protocol: no-IP versus standard-IP versus enhanced-IP) between-subjects design. The dependent variables were *verifiable details*, *unverifiable details, verifiable witness details, verifiable digital details, verifiable sources, verifiable witness sources* and *verifiable digital sources.* We did not run a MANOVA as some of the dependent variables are not mutually exclusive ('verifiable details' is the combination of 'verifiable witness details' and 'verifiable digital details' and

'verifiable sources' is the combination of 'verifiable witness sources' and 'verifiable digital sources').

The analyses revealed significant Veracity main effects for (i) unverifiable details, (ii) verifiable digital details (iii) verifiable witness details and (iv) verifiable digital sources. Univariate analyses indicated that truth tellers provided significantly more unverifiable details than liars. Such findings do not support Hypothesis 2. In addition, truth tellers provided significantly more digital verifiable details, which supports Hypothesis 1a, and more digital sources than liars, which supports Hypothesis 1b. Liars, however provided significantly more witness verifiable details than truth tellers, which was not predicted. Information regarding the Veracity main effects are provided in Table 1.

[insert Table 1 about here]

Significant Information Protocol main effects were found for (i) verifiable details, (ii) unverifiable details, (iii) verifiable digital sources and (iv) verifiable sources. For verifiable details, Tukey post-hoc tests revealed that participants in the standard-IP group provided significantly more verifiable details than those in the no-IP group. No other effects emerged. For unverifiable details, participants in the enhanced-IP condition reported significantly fewer unverifiable details than participants in the no-IP and standard-IP conditions. For verifiable digital sources, participants in the no-IP condition reported fewer verifiable digital sources than participants in the two IP conditions. For verifiable sources, participants in the standard-IP condition reported more verifiable sources than those in the no-IP condition. In addition, participants in the enhanced-IP condition, reported more verifiable sources than those in the no-IP condition. Information regarding the Information Protocol main effects are provided in Table 2.

[insert Table 2 about here]

Only one significant Veracity X Information Protocol interaction effect emerged – for unverifiable details, $F(2, 136) = 5.190$, $p = .007$, $\eta_p^2 = .071$. This does not support Hypothesis 3 in which we predicted a Veracity X Information Protocol interaction effect for verifiable digital details and sources[2].

Exploratory Analyses

In the Introduction, we gave two reasons as to why the best results would be obtained in the enhanced-IP condition. In that condition (i) truth tellers are encouraged to include verifiable details or sources or (ii) it discourages liars from bluffing (resulting in reporting fewer verifiable details or sources). To test these assumptions, we carried out one-way ANOVAs for truth tellers and liars separately with the Information Protocol as the only factor. Two ANOVAs were carried out for truth tellers and two for liars, with *verifiable digital details* and *verifiable digital sources* as dependent variables. For truth tellers, a significant Information Protocol effect was found for verifiable digital sources. Tukey post-hoc tests revealed that truth tellers in the enhanced-IP condition provided significantly more verifiable sources than those in the no-IP condition. Truth tellers in the standard-IP condition also provided significantly more verifiable sources than those in the no-IP condition. No other effects emerged. There were no significant Information Protocol effects for liars.

[insert Table 3 about here]

Discussion

The current study is the first to explore the effectiveness of the Verifiability Approach (VA) when individuals were interviewed about an event after a 7-day delay. In addition, some

[2] An alternative way to test Hypothesis 3 is by running discriminant analyses with Veracity as the classifying variable for each of the three Information Protocol separately. See the supplementary materials for these analyses.

participants were informed in advance about the working of the VA (through the standard-IP and the enhanced-IP), whereas others were not informed. We found that the VA could distinguish between truth tellers and liars but only under specific circumstances. That is, only when digital verifiable information was taken into account. In previous studies, in which no delay was introduced, an IP was found to strengthen the diagnostic value of the VA, although these studies looked at verifiable and non-verifiable details, thus without distinguishing between witness and digital details or between details and sources (Harvey, Vrij, Nahari, et al., 2017; Nahari et al., 2014; Vrij, Nahari, Isitt, & Leal, 2016). In the current experiment, we did not find that the IP enhanced the detection of deception when looking at verifiable details or unverifiable details. We also found that truth tellers provided more unverifiable detail than liars, which was not predicted and goes against the findings in previous studies. We are unable to explain these different findings in our experiment compared to previous work. It could be related to the delay, but to test this an immediate condition needs to be included in the design. One of our initial aims was to see if the VA was still applicable in delay conditions. We did not include an immediate condition as we did not expect significant differences between the immediate and delay conditions. With hindsight, an immediate condition should have been included.

The standard-IP elicited the most verifiable details across both liars and truth tellers, whilst the enhanced-IP reduced the number of verifiable details provided. The enhanced-IP also reduced the provision of unverifiable details. This suggests that the additional wording in the enhanced-IP have made both liars and truth tellers more cautious about the specific details that they gave. Perhaps this stronger enhanced-IP gave both lying and truth telling participants the impression that the interviewer actually would check the details they reported. This would reduce in liars the tendency to bluff but may have also made truth tellers more cautious in reporting

details, perhaps out of fear that due to the fallibility of their memory, these details may not have been accurate. This speculation warrants further investigation.

The current study also broke the verifiable details down into categories: verifiable witness information and verifiable digital information. The finding typically obtained in VA research (truth tellers report more verifiable information than liars) emerged for the digital information only. The current dataset does not allow us to conclude that the delay factor has caused the absence of a Veracity effect for verifiable details, because a 'no delay' control group was not included in the experimental design. However, one could speculate that due to the delay element in the current paradigm, liars may have been more prepared which meant that their verbal outputs were more similar to truth tellers in terms of the summation of verifiable details provided. In fact, liars reported *more* verifiable witness information than truth tellers. The falsifying of digital information is probably more difficult than creating false witness information. For example, it is relatively easy for a liar to state that they were with a friend or witnessed by a friend partaking in particular activities. In previous VA research where participants were asked to describe their planned alibi's, it was found that liars planned to include false alibi witnesses in their statements (Nahari & Vrij, 2015). Research into false alibi's has shown that individuals who are named as a false alibi, often lie for individuals who they deem to be innocent, irrespective of their relationship status (Marion & Burke, 2013). In contrast, it is more difficult for liars to state they were captured on CCTV or left a digital footprint, when they were not in fact in those locations. We live in a digital world where almost all of our actions are digitised, from phone calls, CCTV and receipts through to location tracking on our mobile devices (Lupton, 2012; Michael & Clarke, 2013) geotagging of photographs (Girardin,

Calabrese, Fiore, Ratti, & Blat, 2008) and the 'checking in' of particular locations through social media (Cheng, Caverlee, Lee, & Sui, 2011). Essentially, we all have a digital 'trace'.

Digital information is not only more difficult to fool by liars than witness information, it may also easier for investigators to check the veracity status of digital information than the veracity status of witness information, especially if witnesses are difficult to trace or may not be seen as credible. The credibility of witness statements is generally a subjective inference, made upon a variety of factors, including character, dependability, and truthfulness (Dunbar et al., 2013). In fact, credibility may be seen "the largest determinant of a deception judgment" (Bond & DePaulo, 2008, p. 487). In comparison, verifiable digital information is by nature, an objective inference. Therefore, the presence of confirmatory digital information is a stronger variable to be used in assessment of a witness statement than that of credibility alone. Many criminal trials do not assess truth versus lie, but that of credibility (Denault & Jupe, 2017) and that liars of high credibility are more often believed than low credibility truth tellers (Bond & DePaulo, 2008). If investgators are able to encourage the provision of digitial verifiable details by truth tellers, then it is more likely that veracity assesments based upon evidence, rather than inferential and subjective credibility, can be made.

We distinguished between verifiable details and verifiable sources and obtained similar findings for them. This finding has great potential if it could be replicated. In all likelihood, investigators cannot count the number of reported verifiable details in real time, but they may be capable of counting the number of verifiable sources in real time. This finding could thus be an important step in implementing the VA in real life investigations. Once a suspect reports a verifiable source, this could be checked imminently.

We also explored the data further. We gave two possible reasons why an enhanced-IP would be beneficial in the current study: (i) perhaps truth tellers are encouraged to report verifiable information (details or sources) when they are informed about the VA or perhaps (ii) liars bluff less (i.e., provide less false verifiable details or sources) when informed about the VA. We found that truth tellers who were informed of the enhanced-IP provided more verifiable digital sources than those who were not informed of the enhanced-IP. There was no difference for informed and uninformed liars. This suggests that the enhanced-IP made truth tellers more aware of their need to provide verifiable details rather than that it discouraged liars from bluffing during the interview.

Finally, there was no difference between individuals in the standard-IP and enhanced-IP in terms of their belief that their statements would be checked for verifiable details. The experimental paradigm may be able to explain such differences. It is more likely that individuals interviewed in real life investigations would have a higher belief that their details would be checked by investigators than the participants in laboratory experiment. Therefore, although the IP had no effect on liars in the experiment, we do not rule out that the IP would discourage liars from bluffing in real life.

References

Bell, B. E., & Loftus, E. F. (1989). Trivial persuasion in the courtroom: The power of (a few) minor details. *Journal of Personality and Social Psychology*, *56*(5), 669–679. https://doi.org/10.1037/0022-3514.56.5.669

Bond, C. F., & DePaulo, B. M. (2008). Individual differences in judging deception: Accuracy and bias. *Psychological Bulletin*, *134*(4), 477–492. https://doi.org/10.1037/0033-2909.134.4.477

Boskovic, I., Bogaard, G., Merckelbach, H., Vrij, A., & Hope, L. (2017). The Verifiability Approach to detection of malingered physical symptoms. *Psychology, Crime & Law*, *23*(8), 717–729. https://doi.org/10.1080/1068316X.2017.1302585

Boskovic, I., Gallardo, C. T., Vrij, A., Hope, L., & Merckelbach, H. (2018). Verifiability on the run: an experimental study on the verifiability approach to malingered symptoms. *Psychiatry, Psychology and Law*, 1–12. https://doi.org/10.1080/13218719.2018.1483272

Cheng, Z., Caverlee, J., Lee, K., & Sui, D. Z. (2011). Exploring Millions of Footprints in Location Sharing Services. *Icwsm*, *2010*(Cholera), 81–88. https://doi.org/papers3://publication/uuid/0C46BD5D-4908-4A8A-BD06-5BCB2F1DE282

Cohen J. (1992). A Power Primer. *Psychological Bulletin*, *112*(1). https://doi.org/10.1038/141613a0

Denault, V., & Jupe, L. M. (2017). Deception detection: from police-suspect and investigative interviews to trials. In B. Baker, R. Minhas, & L. Wilson (Eds.), *Psychology and Law Factbook* (Vol. 2, pp. 22–24). Derby, UK: European Association of Psychology and Law Student Society.

Dunbar, N. E., Jensen, M. L., Burgoon, J. K., Kelley, K. M., Harrison, K. J., Adame, B. J., &

Bernard, D. R. (2013). Effects of Veracity, Modality, and Sanctioning on Credibility Assessment During Mediated and Unmediated Interviews. *Communication Research*, 1–26. https://doi.org/10.1177/0093650213480175

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/BF03193146

Gilovich, T., Medvec, V. H., & Savitsky, K. (1998). The Illusion of Transparency: Biased Assessments of Others' Ability to Read One's Emotional States. *Article in Journal of Personality and Social Psychology*, *75*(2), 332–346. https://doi.org/10.1037//0022-3514.75.2.332

Girardin, F., Calabrese, F., Fiore, F. D., Ratti, C., & Blat, J. (2008). Digital Footprinting: Uncovering Tourists with User-Generated Content. *IEEE Pervasive Computing*, *7*(4), 36–43. https://doi.org/10.1109/MPRV.2008.71

Granhag, P. A., & Hartwig, M. (2008). A new theoretical perspective on deception detection: On the psychology of instrumental mind-reading. *Psychology, Crime & Law*, *14*(3), 189–200. https://doi.org/10.1080/10683160701645181

Hartwig, M., Anders Granhag, P., & Strömwall, L. A. (2007). Guilty and innocent suspects' strategies during police interrogations. *Psychology, Crime & Law*, *13*(2), 213–227. https://doi.org/10.1080/10683160600750264

Harvey, A. C., Vrij, A., Leal, S., Lafferty, M., & Nahari, G. (2017). Insurance based lie detection: Enhancing the verifiability approach with a model statement component. *Acta Psychologica*, *174*, 1–8. https://doi.org/10.1016/J.ACTPSY.2017.01.001

Harvey, A. C., Vrij, A., Nahari, G., & Ludwig, K. (2017). Applying the Verifiability Approach

to insurance claims settings: Exploring the effect of the information protocol. *Legal and Criminological Psychology*, *22*(1), 47–59. https://doi.org/10.1111/lcrp.12092

Jupe, L. M., Leal, S., Vrij, A., & Nahari, G. (2017). Applying the Verifiability Approach in an international airport setting. *Psychology, Crime & Law*, *23*(8), 812–825. https://doi.org/10.1080/1068316X.2017.1327584

Jupe, L. M., Vrij, A., Leal, S., Mann, S., & Nahari, G. (2016). The Lies we Live: Using the Verifiability Approach to Detect Lying about Occupation. *Journal of Articles in Support of the Null Hypothesis*, *13*(1), 1–14.

Jupe, L. M., Vrij, A., Leal, S., & Nahari, G. (2018). Are You for Real? The Use of Unexpected Process Questions Within the Detection of Identity Deception. *Applied Cognitive Psychology*, *32*(5), 622–634. https://doi.org/10.1002/acp.3446

Leal, S., Vrij, A., Vernham, Z., Dalton, G., Jupe, L., Harvey, A., & Nahari, G. (2018). Cross-cultural verbal deception. *Legal and Criminological Psychology*, *23*(2), 192–213. https://doi.org/10.1111/lcrp.12131

Leins, D. A., Fisher, R. P., & Ross, S. J. (2013). Exploring liars' strategies for creating deceptive reports. *Legal and Criminological Psychology*. https://doi.org/10.1111/j.2044-8333.2011.02041.x

Lupton, D. (2012). *Digital Sociology: An Introduction*. Sydney: University of Sydney. Retrieved from https://books.google.co.uk/books?hl=en&lr=&id=_HEhBQAAQBAJ&oi=fnd&pg=PP1&ots=WTpn_9Pza9&sig=M7MVmdTOb4CLEeDl4xiDeoYWCWQ#v=onepage&q&f=false

Marion, S. B., & Burke, T. M. (2013). False alibi corroboration: Witnesses lie for suspects who seem innocent, whether they like them or not. *Law and Human Behavior*, *37*(2), 136–143.

https://doi.org/10.1037/lhb0000021

Masip, J., & Herrero, C. (2013). 'What Would You Say if You Were Guilty?' Suspects' Strategies During a Hypothetical Behavior Analysis Interview Concerning a Serious Crime. *Applied Cognitive Psychology*, *27*(1), 60–70. https://doi.org/10.1002/acp.2872

Michael, K., & Clarke, R. (2013). Location and tracking of mobile devices: Überveillance stalks the streets. *Computer Law & Security Review*, *29*(3), 216–228. https://doi.org/10.1016/J.CLSR.2013.03.004

Nahari, G. (2018a). Reality Monitoring in the Forensic Context: Digging Deeper into the Speech of Liars. *Journal of Applied Research in Memory and Cognition*, (2017). https://doi.org/10.1016/j.jarmac.2018.04.003

Nahari, G. (2018b). The Applicability of the Verifiability Approach to the Real World. In P. R. J (Ed.), *Detecting Concealed Information and Deception: Recent Developments* (pp. 329–349). https://doi.org/10.1016/B978-0-12-812729-2.00014-8

Nahari, G., Leal, S., Vrij, A., Warmelink, L., & Vernham, Z. (2014). Did Somebody See It? Applying the Verifiability Approach to Insurance Claim Interviews. *Journal of Investigative Psychology and Offender Profiling*, *11*(3), 237–243. https://doi.org/10.1002/jip.1417

Nahari, G., & Vrij, A. (2014). Can I borrow your alibi? The applicability of the verifiability approach to the case of an alibi witness. *Journal of Applied Research in Memory and Cognition*. https://doi.org/10.1016/j.jarmac.2014.04.005

Nahari, G., & Vrij, A. (2015). Can someone fabricate verifiable details when planning in advance? It all depends on the crime scenario. *Psychology, Crime & Law*, *21*(10), 987–999. https://doi.org/10.1080/1068316X.2015.1077248

Nahari, G., Vrij, A., & Fisher, R. P. (2014a). Exploiting liars' verbal strategies by examining the

verifiability of details. *Legal and Criminological Psychology*, *19*(2), 227–239. https://doi.org/10.1111/j.2044-8333.2012.02069.x

Nahari, G., Vrij, A., & Fisher, R. P. (2014b). The verifiability approach: Countermeasures facilitate its ability to discriminate between truths and lies. *Applied Cognitive Psychology*. https://doi.org/10.1002/acp.2974

Savitsky, K., & Gilovich, T. (2003). The illusion of transparency and the alleviation of speech anxiety. *Journal of Experimental Social Psychology*, *39*(6), 618–625. https://doi.org/10.1016/S0022-1031(03)00056-8

Vrij, A. (2008). *Detecting Lies and Deceit: Pitfalls and opportunities*. Chichester: Wiley.

Vrij, A., Hope, L., & Fisher, R. P. (2014). Eliciting Reliable Information in Investigative Interviews. *Policy Insights from the Behavioral and Brain Sciences*, *1*(1), 129–136. https://doi.org/10.1177/2372732214548592

Vrij, A., Meissner, C. A., Fisher, R. P., Kassin, S. M., Morgan, A., & Kleinman, S. M. (2017). Psychological Perspectives on Interrogation. *Perspectives on Psychological Science*, *66*(JUnE 2015), 635–648. https://doi.org/10.3389/fpsyg.2015.00258

Vrij, A., & Nahari, G. (2019). The Verifiability Approach. In J. Dickenson, J, N. Schreiber Compo, N. Carol, R, L. Schwartz, B, & R. McCauley, M (Eds.), *Evidence-based investigative interviewing: applying cognitive principles* (pp. 116–133). New York: Routledge. Retrieved from https://books.google.co.uk/books?hl=en&lr=&id=quOLDwAAQBAJ&oi=fnd&pg=PP1&dq=Evidence-based+Investigative+Interviewing:+Applying+Cognitive+Principles+verifiability+approach&ots=5NpzoXzict&sig=gagwkbcjcwOjfwSTXBd20Jz1kR8#v=onepage&q=Evidence-

based Investi

Vrij, A., Nahari, G., Isitt, R., & Leal, S. (2016). Using the Verifiability lie Detection Approach in an Insurance Claim Setting. *Journal of Investigative Psychology and Offender Profiling*, *13*(3), 183–197. https://doi.org/10.1002/jip.1458

Table 1

Veracity main effects

Variable	**Truth tellers (*n* = 78*)*** Mean (SD) *95% CI*	**Liars (*n* = 64)** Mean (SD) *95%CI*	***F***	***p***	***d***
Verifiable details	7.55 (9.94) *5.38 – 9.97*	5.39 (6.18) *3.93 – 6.97*	1.942	.166	.26
Unverifiable details	19.26 (15.97) *15.77- 23.12*	7.96 (9.16) *5.74 – 10.32*	29.537	**<.001**	.87
Verifiable witness details	1.40 (7.46) *1.17 – 3.18*	3.82 (5.61) *2.51 – 5.40*	2.879	**.046***	.29
Verifiable digital details	6.15 (15.88) *3.23 – 10.03*	1.51 (2.68) *.91 – 2.30*	5.033	**.026***	.41
Verifiable sources	1.00 (.81) *.84 – 1.20*	.87 (.70) *.70 – 1.05*	1.048	.308	.017
Verifiable witness sources	.39 (.49) *.28 - .50*	.52 (.20) *.39 - .64*	2.575	.111	.34
Verifiable digital sources	.61 (.49) *.51 - .72*	.35 (.50) *.23 - .47*	11.012	**.002****	.53

*$p < .05$; ** $p < .005$

Table 2

Information protocol main effects

Variable	**no-IP (*n* = 43*)***	**Standard-IP (*n* = 46)**	**Enhanced-IP (*n* = 53)**	***F***	***p***	η_p^2
	Mean (SD) *95% CI*	Mean (SD) *95%CI*	Mean (SD) *95%CI*			
Verifiable details	3.04^{a} (4.66) *1.76 – 4.55*	10.23^{b} (11.10) *7.16 – 13.55*	6.26^{ab} (7.02) *3.81 – 10.29*	8.085	**<.001**	.106
Unverifiable details	15.76^{bc} (12.86) *11.90 – 19.58*	20.26^{c} (18.88) *15.35 - 26.11*	7.58^{a} (6.65) *5.78 – 9.50*	10.840	**<.001**	.106
Verifiable witness details	1.78 (3.54) *.84 – 2.85*	3.37 (14.33) *-1.32 – 6.83*	2.64 (3.81) *1.36 – 3.27*	.722	.488	.011
Verifiable digital details	1.12 (2.47) *.45 – 1.93*	6.87 (19.58) *2.71 – 13.97*	4.00 (6.80) *2.43 – 5.98*	1.196	.151	.106
Verifiable sources	$.60^{a}$ (.74) *.37 – .82*	1.06^{b} (.74) *.63 – .83*	1.13^{bc} (.73) *.92 – 1.32*	6.742	**.002***	.091
Verifiable witness sources	.31 (.46) *.16 - .49*	.52 (.51) *.37 - .50*	.51 (.50) *.36 – .64*	2.334	.101	.033
Verifiable digital sources	$.28^{a}$ (.45) *.15 - .42*	$.54^{b}$ (.50) *.39 – .69*	$.62^{bc}$ (.49) *.47 - .75*	6.483	**.002***	.088

* $p < 0.01$

Note. Only means (in rows) with different superscript differ significantly from each other (p < .05)

Table 3

Information Protocol main effects as a function of Veracity

Variable		**no-IP (*n* = 43*)***	**Standard-IP (*n* = 46)**	**Enhanced-IP (*n* = 53)**	***F***	***p***	η_p^2
		Mean (SD) *95% CI*	Mean (SD) *95%CI*	Mean (SD) *95%CI*			
Truth tellers	Verifiable digital details	1.21 (2.30) *.36 – 2.17*	10.62 (25.00) *.3.74 – 22.00*	6.07 (8.64) *3.36 – 9.96*	2.311	.016	0.58
	Verifiable digital sources	$.33^{a}$ (.48) *.14 - .53*	$.96^{bc}$ (.85) *.64 – 1.27*	1.00^{c} (.62) *.78 – 1.23*	7.65	**.001***	.169
Liars	Verifiable digital details	1.00 (2.47) *.00 – 2.47*	1.53 (2.09) *.67 – 2.55*	1.85 (3.02) *.79 – 3.14*	.524	.595	.017
	Verifiable digital sources	.17 (.38) *.00 – .36*	.47 (.61) *.20 - .76*	.50 (.58) *.29 - .74*	2.271	.112	.070

* $p < 0.05$

Note. Only means (in rows) with different superscript differ significantly from each other (p < .05

Table 4

Classification results for verifiable details, verifiable witness details, verifiable digital details, verifiable witness sources and verifiable digital sources as a function of Information Protocol

	Variable	**Percentage of cases correctly classified**			**χ2**	**Wilks' λ**	***p***	**Canonical correlation**
		Truth teller (%)	Liar (%)	Total (%)				
No-IP	Verifiable details	-	-	-	.041	.999	.840	.032
	Verifiable witness details	-	-	-	.026	.999	.873	.026
	Verifiable digital details	-	-	-	.070	.998	.791	.042
	Verifiable sources	-	-	-	.228	.993	.591	
	Verifiable witness sources	-	-	-	2.608	.936	.106	.253
	Verifiable digital sources	-	-	-	.590	.985	.443	.122
								.085
Standard-IP	Verifiable details	-	-	-	.752	.983	.386	.131
	Verifiable witness details	-	-	-	2.054	.954	.152	.215
	Verifiable digital details	-	-	-	2.396	.946	.122	.232
	Verifiable sources	-	-	-	.009	1.00	.924	
	Verifiable witness sources	-	-	-	.1.506	.966	.220	.184
	Verifiable digital sources	-	-	-	1.890	.957	**.**169	.206
								.014
Enhanced-IP	Verifiable details	-	-	-	2.544	.951	.111	.222
	Verifiable witness details	-	-	-	1.171	.977	.279	.151
	Verifiable digital details	**48.1%**	**51.9%**	**64.2%**	5.227	.902	**.022***	.314
	Verifiable sources	**48.1%**	**80.8%**	**64.2%**	5.960	.889	**.015***	
	Verifiable witness sources	-	-	-	.017	1.00	.895	.019
	Verifiable digital sources	**85.2%**	**61.5%**	**73.6%**	13.344	.768	**<.001**	.482

* $p < .05$

Appendix

Example of VA coding

The following shows a working example of VA coding.

For example, in the statement '…I smoked a cigarette and sat on a bench…' four pieces of information are coded: 'smoked', 'cigarette', 'sat' and 'bench'. These details are deemed unverifiable; that is there is no evidence that can be used to support such statements. However, in the statement '…I spoke with my tutor Mike Jameson and called my sister Amanda…' there are four pieces of information: 'spoke', 'my tutor Mike Jameson', 'called', and 'my sister Amanda'. These pieces are deemed verifiable because the act of speaking to their tutor Mike Jameson is an activity carried out with a named person who can be identified. In terms of using these individuals as an alibi, the act of speaking to Mike Jameson provides a verifiable time that would have been spent talking with him (thus indicating the individual was not partaking in a crime at that particular time) which could then be checked, which results in there being two pieces of verifiable information instead of one; the act of speaking with Mike Jameson which can be verified by Mike Jameson and, in addition, the time of the exchange. In addition, the telephone conversation with Amanda is an activity that is carried out with a named person who can be identified but it will also have been recorded on the mobile that was used to make the call.

In the current study, we also counted verifiable *sources*; that is sources that could ascertain verifiability of the details, such as named persons, CCTV footage, phone calls, text messages, bank statements and receipts. Thus, the sentence "We saw my friend John when we had lunch in Zvi restaurant and I paid on my credit card" contains: four verifiable details (the underlined words), one verifiable witness source (my friend John) and one digital source (I paid on my credit card). John is a witness source and a verifiable detail source as we can

source ‘John’ from the witness. Investigators would then be able to follow this up by obtaining further details about ‘John’ from the witness to verify that they had, in fact, been dining together in a restaurant. In addition, investigators could check the credit card records to see if the payment had been made.

Supplementary Material

Exploratory Analysis

We carried out discriminant analyses and entered as predictors *verifiable details*, *verifiable witness details*, *verifiable digital details*, *verifiable sources*, *verifiable witness sources* and *verifiable digital sources*. These six predictors were entered in separate discriminant analyses so that each discriminant analysis always contained one predictor. This results in eighteen discriminant analyses; which results are reported in Table 4. For the accuracy rates, we report the cross-validated 'leave-one-out' results.

Table 4 shows that in the no-IP and the standard-IP condition, none of the discriminant analyses yielded a significant result compared to three analyses in the enhanced-IP condition. Of the three significant findings, two refer to verifiable digital details and sources and the third refers to verifiable sources. The best results were therefore obtained in the enhanced-IP condition, supporting Hypothesis 3.

[insert Table 4 about here]