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Applying the asymmetric information management technique to insurance claims

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Abstract

This study investigates the Asymmetric Information Management (AIM) technique's ability to detect fraudulent insurance claims submitted online. The AIM instructions inform claimants that, inter alia, more detailed statements are easier to accurately classify as genuine or fabricated. To test this, truth tellers ($n = 55$) provided an honest statement about a lost or stolen item, while liars ($n = 53$) provided a false claim. All claimants were randomly assigned to either receive the control or AIM instructions. We found that truth tellers provided more information in the AIM condition (compared to the control condition), and discriminant analysis classificatory performance was improved slightly. Unfortunately, the AIM instructions had little effect on the amount of information liars provided. Thus, the AIM technique is useful for supporting truth tellers to be more detailed, but more work needs to be conducted to assess why liars in this study did not adapt a withholding strategy.

KEYWORDS
AIM technique, fraud, information elicitation, insurance claims, lie-detection

1 | INTRODUCTION

Detecting deception is difficult with accuracy for both truth and lie detection being consistently around chance level (Bond Jr & DePaulo, 2006; Bond Jr & DePaulo, 2008). This is because people typically display few verbal and non-verbal cues to deception (DePaulo et al., 2003). Despite this, researchers suggest a natural difference between truth tellers and liars in the verbal output they produce (e.g., Vrij, 2008). To enhance this natural veracity difference, focus has been placed upon imposing cognitive loads, using unanticipated questions, or designing new tools that encourage interviewees to say more (Vrij et al., 2017). Asking unanticipated questions are problematic as this approach assumes knowledge is available about the crime or incident. The imposing cognitive load approach is easier to implement and is based upon the assumption that increasing an individual's cognitive load (e.g., by asking them to do an additional task on top of being interviewed) will benefit lie detection, by reducing their capacity to effectively lie (Vrij et al., 2006). This concept has attracted much scientific debate (Levine et al., 2018; Vrij et al., 2017; Vrij & Granhag, 2012), and researchers have raised concerns that, by imposing cognitive load, honest people may also struggle to come up with true pieces of information (because they are also doing multiple things at once). Meta-analytic findings suggest that imposing cognitive load can decrease lie detection by taxing the mental resources available to truth tellers, making it more difficult for them to quickly and easily provide truthful information (Verschuere et al., 2018).

The encouraging interviewees to say more approach is a less cognitively demanding alternative, and is based upon the premise that truth tellers, when prompted, can provide more detailed statements (see Porter et al., 2018; Porter & Salvanelli, 2020). This is often the case when tools such as the Model Statement are used (Bogaard et al., 2014; Harvey, Vrij, Leal, et al., 2017). Unfortunately, liars also benefit from such tools as they realise that being more detailed can help them to avoid detection from investigators (Ewens et al., 2016;

Leal et al., 2015; for a critical analysis see Porter et al., 2021). An alternative approach is to instead focus on creating an information management dilemma which forces truth tellers and liars to respond differently and therefore reduces any potential advantage for a liar (Nahari, Vrij, et al., 2014a; Nahari, Vrij, et al., 2014b).

1.1 | Information management dilemma in lie-detection

In the deception literature, an information management dilemma refers to a situation (usually established via an interviewing instruction) whereby information presented to the interviewees leads to a conflict (the dilemma), usually for the liar, about what information to report during the subsequent interview. There are two examples of this, (i) the Verifiability Approach (VA; Nahari, Vrij, et al., 2014a; Nahari, Vrij, et al., 2014b) and (ii) the Asymmetric Information Management (AIM) technique (Porter et al., 2020).

The VA works by informing interviewees about the importance of reporting verifiable detail (usually via an information protocol; see Harvey, Vrij, Leal, et al., 2017). Upon hearing this information truth tellers can freely disclose checkable information, whereas liars do not. Theoretically, this may be due to liars facing an information management dilemma (Nahari, Vrij, et al., 2014a). Liars want to provide a detailed statement to appear convincing, without providing information investigators may check. To do this, liars instead disclose less verifiable information, and may instead compensate by providing unverifiable information (Vrij et al., 2016). As such, the VA works by increasing the amount of verifiable detail truth tellers disclose (but not liars), enhancing lie-detection (for meta-analyses see, Palena et al., 2021; Verschuere et al., 2021).

In contrast, the AIM instructions attempt to disrupt the willingness of liars (but not truth tellers') to report detailed statements (see Porter et al., 2020). Typically, all interviewees are informed about the conceptual association between reporting detailed statements and the increased chance of being accurately judged as truthful or deceptive. For truth tellers, being accurately judged as credible is their objective and thus they provide more information. Liars are encouraged to believe that providing more information will make their deceit easier to detect (which is true). As a consequence, liars should provide less information after hearing the instructions than they would normally without the instructions. The AIM technique is therefore more general than the VA and establishes an information management dilemma that encourages liars to withhold information, while encouraging truth tellers to be more forthcoming. Whereas the VA focuses on verifiable information the AIM technique focuses on general detail and therefore not restricted to verifiable information, which could lead to greater lie-detection accuracy in insurance claim settings.

The first AIM study (Porter et al., 2020) found that liars withheld more information, while truth tellers reported more information (compared to the control conditions). However, in Porter et al. (2020) participants were interviewed following a suspected data breach. The objective of this study is to assess whether the AIM technique enhances more information elicitation for honest insurance claimants, while suppressing the verbal output of lie-telling insurance claimants.

1.2 | Different domains in lie-detection

Generalising from one domain of lie detection (i.e., police–suspect settings) to another (i.e., insurance claim settings) is potentially hazardous (Harvey, Vrij, Hope, et al., 2017; Harvey, Vrij, Leal, et al., 2017; Harvey, Vrij, Nahari, et al., 2017). Insurance settings differ in one fundamental aspect from police settings. During police suspect interviews the investigators often know when the crime occurred (e.g., the timing of a robbery or assault) and thus the emphasis is upon the suspects to demonstrate that they were at a location other than the crime scene when the transgression took place. This context provides little opportunity for an embedding strategy to be used, compared to when an insurance claimant is reporting an incident (e.g., when loss, theft or damage occurred). In this context, insurance investigators do not know when the reported incident occurred, or if it really did.

Embedded lies are when a deception is hidden within the truthful experiences of a person (Leins et al., 2013; Vrij, 2008). Research has shown that embedded lies reduce the effectiveness of well-established verbal veracity tools that assess overall detail, such as Reality Monitoring (Nahari et al., 2011). This is not surprising as a central assumption of Reality Monitoring—that a fabricated report originates from internal processes (Johnson & Raye, 1981; Vrij, 2008)—is violated in cases where an embedded lie is reported. Therefore, in a police suspect interview the suspect has a limited ability to use embedding due to the information investigators have (i.e., time of the incident). In contrast, for insurance claims, the claimant can fraudulently report that the item was lost or stolen at an event that he or she actually attended, thus making lie-detection more difficult (Leal et al., 2015). Based upon the findings of the first AIM technique experiment (see Porter et al., 2020) we propose a solution to this problem.

The findings of the first experiment showed that truth tellers can be encouraged to provide more information while at the same time (hearing the same instructions) liars are prompted to withhold information (Porter et al., 2020). Applying the AIM instruction to insurance claims may still encourage truth tellers to report more information, but importantly, such instructions may also reduce the amount of information that liars provide, thus enhancing lie-detection accuracy. Therefore, we predict that truth tellers in the AIM condition will provide more overall detail than truth tellers in the control condition (Hypothesis 1), and that Liars in the AIM condition will provide less overall detail than liars in the control condition (Hypothesis 2). Based upon the information elicitation effect, we predicted that accurate discrimination between truth tellers and liars will be enhanced in the AIM condition, compared to the control condition (Hypothesis 3).

2 | METHOD

2.1 | Pre-registration

This study was pre-registered, and the survey materials are provided on the OSF (see https://osf.io/56m9e). The preregistration was completed (September 2020) after the start of data collection (April 2020). The researchers had not downloaded the data and no analysis were preformed prior to the preregistration.

2.2 | Design

A 2 (veracity: truth teller vs. liar) × 2 (reporting condition: Asymmetric Information Management 'AIM' technique vs. control condition) quasi-experimental design was used. Participants read the following study advert and decided if they wished to take part in the research:

Researchers at the University are interested in lie-detection and insurance claims. We are seeking participants over the age of 18 to either lie or tell the truth about a lost or stolen item. If you would like to take part and you have had an item lost or stolen in the last 3 years (worth between £100 and £1000) then click here (*survey link provided*) where you will provide a truthful statement. If you have not lost or had an item stolen in the past 3 years but would like to take part in the study as a liar, click here (*survey link provided*).

Individuals who were interested in the study clicked on the link provided which took them to an online information sheet and consent form, which contained more detailed information about the study.

2.3 | Excluded data

A total of 10 participants did not complete the statement part of the study and therefore were excluded from the dataset. One participant was excluded from the data for rating their motivation score as 'very unmotivated', and for providing a six-word statement. The researchers considered this data point an outlier. Removing this outlier was a deviation from the pre-registered exclusion data plan.

2.4 | Participants

A total of 108 participants (71 females, 36 males and 1 other) aged between 20 and 58 years ($M = 29.46$, $SD = 9.05$) were included as part of this study. The sample contained students within the university and members of the public. No incentives or rewards were provided for taking part in this study.

2.5 | Sample size rationale

A power analysis using G*Power (Faul et al., 2007), assuming a medium effect size of $f = 0.30$ (alpha = 0.05) for four groups, indicated a sample size of 90 would be sufficient for an acceptable power of 0.80 (Cohen, 1992).

2.6 | Procedure

Participants were recruited via adverts placed on the researchers' social media accounts (i.e., Facebook, Twitter and LinkedIn), and the course Moodle page. Participants who were interested in the study were invited to click on the link to the *Online Surveys* page. All participants then read an online information sheet informing them that they must be at least 18 years old and must have good written English to take part in the study, due to the requirement to provide a typed statement. Participants were informed that taking part in this research was voluntary and that no incentives or rewards would be provided. They were also informed that the study would be conducted completely online.

Each participant firstly read an information sheet about the study and were then asked to provide informed consent if they were happy to take part. Participants could only continue onto the experiment after clicking the approved consent option. Demographic information (age, gender and occupation) was collected along with the participants' motivation scores: 'How motivated are you to provide a convincing statement?' (7-point Likert scale '1- extremely unmotivated' to '7- extremely motivated').

Each participant was assigned to either the truthful or deceptive condition. If a participant had lost an item or had an item stolen in the previous 3 years that cost between £100 and £1000 they were invited to take part in the study as a truth teller. If they did not, then they were invited to be a liar. The lying condition was completed before the truthful condition. Upon reaching 53 lie-telling participants we closed the survey link for liars, and instead focused on recruiting truth tellers. This procedure is similar to other insurance domain research (Harvey, Vrij, Leal, et al., 2017; Harvey, Vrij, Nahari, et al., 2017; Vrij et al., 2016).

Truth tellers ($n = 55$) were asked to imagine that they were submitting a claim about their lost/stolen item to an insurance company. They were asked to type a personal statement to describe their real incident of loss/theft in as much detail as possible into the online box provided. They were informed that they needed to convince the insurance investigator that they were telling the truth and that their item indeed had been lost or stolen. To make this clear the following instructions were provided before the claim form: 'For this study you are a truth teller, and your task is to provide a truthful statement about either a stolen or lost item. Imagine that you are being asked to submit your statement to an insurance company who will reimburse you for your loss if your story is convincing. Your task is to produce a statement that the insurance expert cannot disprove'.

Liars ($n = 53$) were asked to imagine that they were submitting a claim about a lost/stolen item to an insurance company. They were asked to type a personal statement to describe a fabricated incident of loss/theft in as much detail as possible into the online box provided. It was left entirely up to them what type of statement to

fabricate. Like the truth tellers, they were told that they needed to convince the insurance investigator that they were telling the truth and that their item indeed had been lost or stolen. To make this clear the following instructions were provided before the claim form: 'For this study you are playing the role of a liar and your task is to provide a made-up statement about either a stolen or lost item. Imagine that you are being asked to submit your statement to an insurance company who will reimburse you for your loss if your story is convincing. Your task is to produce a statement that the insurance expert cannot disprove'.

All participants received the following instruction 'Complete the statement form below if you have lost, or had an item stolen in the previous 3 years. The item to be claimed against must cost between £100 and £1,000'. Participants were randomly allocated to either the AIM or control condition upon opening the survey link.

In the control condition the instruction was based upon the standard tell me everything instruction (used in Porter et al., 2020). This instruction was 'Please provide a statement—in your own words and in as much detail as possible—about what happened during this event'.

2.7 | Aim condition

The AIM condition began with the tell me everything instruction, and then cued the participants to the actual AIM instructions (adapted from Porter et al., 2020).

> AIM instructions Please provide a statement—in your own words and is as much detail as possible—about what happened during this event. First however, please pay close attention to following information: Insurance claimants often overestimate how easily insurers can detect fraud. Actually, fraud-detection is not easy, and insurers cannot take your honesty for granted. However, you can make it easier for an insurer to determine whether your claim is honest (genuine) or deceptive (fraudulent). This is because lie-detection techniques become *more* accurate and *more* reliable with the more information you provide. Therefore, if you provide a longer, more detailed statement, insurers will be better able to classify your statement as either being truthful (genuine) or deceptive (fraudulent).
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After providing their statement, participants were asked to (i) provide a rating of how truthful their statement was (percentage scale ranging from 0%—a complete lie to 100%—the complete truth), and (ii) to state if they believed the instruction encouraged them report more information on a 7-point Likert scale from 1- '*not at all*' to 7 '*to a great extent*'.

Participants were then provided with a debriefing form, thanked, and invited to contact the experimenter if they had any questions.

2.8 | Coding

All statements were rated by one coder (blind to the experimental conditions and hypotheses) who scored the occurrence of overall detail, as reported in Porter et al. (2020). That is the combined total of: (i) spatial detail, (ii) temporal detail, (iii) perceptual detail, (iv) and action detail. Spatial, temporal, and perceptual detail are part of the Reality Monitoring framework (see Johnson & Raye, 1981), which is commonly used in the lie-detection literature (Vrij, 2008). Action details (details about others' or one's own activities) are not included in the Reality Monitoring's coding scheme (Memon et al., 2010; Vrij, 2008; Vrij, 2015), but depict sensory information that should be included in analysis (for a similar observation see Porter et al., 2018; Porter et al., 2020). Spatial details refer to information about locations, or arrangements and/or objects (e.g., 'I went *left*, *towards* the Park, then turned *right*'), temporal details relate to information about when the event happened or explicit descriptions of the sequence of various events (e.g., 'I arrived at the party, around *2pm* and *then* looked for my friends'), perceptual details relate to information about what was seen, heard, felt, tasted, and smelt during the described activities (e.g., 'I saw a *woman* at the reception area who *spoke* to me'), and action details relate to information that explicitly describes an action or the process of actions performed by the participant (e.g., 'I *stole* a mobile phone from the building').

2.9 | Reliability coding

A second coder (also blind to the experimental conditions) coded a random selection of 27 statements (approximately 25% of the sample). Inter-rater reliabilities between the two coders for the occurrence frequency of details were measured via intra-class correlation coefficients (ICC). The two-way random effects model measuring consistency was used. The ICC was high and therefore satisfactory for overall detail [ICC] = .979. Single measures were used for the intraclass correlation coefficient.

3 | RESULTS

The ANOVA procedures below are used to test the null hypothesis that no difference between truth tellers or liars are found when the AIM instructions are used, compared to the control instructions. To assess the strength of evidence, and in addition to null hypothesis significance testing, we also calculated a Bayes Factor (BF) score (e.g., Wagenmakers et al., 2016) using a default Bayesian t test (with the default Cauchy's prior of 0.707; *see* Lakens, 2013) via open-source JASP software. BF_{10}

is the Bayes factor giving the evidence for an alternative hypothesis over the null (and increases when evidence more strongly supports the alternative hypothesis). BF_{01} is the Bayes factor giving the evidence for the null hypothesis over the alternative (and increases when evidence more strongly supports the null hypothesis). Note: $BF_{10} = 1/BF_{01}$.

We used the interpretation scheme for the Bayes Factor (BF), as proposed by Jeffrey's (1961) and modified by Lee and Wagenmakers (2013).

Motivation: Truth tellers ($M = 5.11$, $SD = 1.36$, 95% CI [4.74, 5.48]) and liars ($M = 5.21$, $SD = 1.61$, 95% CI [4.76, 5.65]) reported similar motivation to perform well scores, $F(1, 104) = .164$, $p = .686$, $d = 0.07$, 95% CI [−0.31, 0.44], $BF_{10} = .22$. There were no differences between the reporting conditions (AIM vs. control), and no veracity × reporting condition interaction effect emerged, all fs <1.33, all ps >2.51, all BF_{10}'s < .36

Veracity manipulation check: Truth tellers reported being overwhelmingly more truthful ($M = 89.64$, $SD = 15.03$, 95% CI [85.57, 93.70]) than liars ($M = 23.77$, $SD = 32.34$, 95% CI [14.89, 32.66]), $F(1, 104) = 197.37$, $p < .001$, $d = 2.63$, 95% CI [2.10, 3.13], $BF_{10} = 6.70$. The finding that liars reported that they were somewhat truthful was not surprising and fits well with the notion that liars, where possible, try to embed their lies in truthful stories (Leins et al., 2013). A main effect suggest the AIM instructions ($M = 65.09$, $SD = 39.55$, 95% CI [56.87, 70.03]) elicited more truthfulness than the control instructions ($M = 49.82$, $SD = 42.10$, 95% CI [44.03, 56.93]), $F(1, 104) = 7.81$, $p = .006$, $d = 0.37$, 95% CI [−0.01, 0.75], $BF_{10} = 1.09$, however no Veracity × Reporting condition interaction effect emerged, all Fs <7.81, all ps > .006, $BF_{10} = 3.42$.

Perceptions of instructions: We were interested in whether the information elicitation effect of the AIM technique would be implicit or explicit. A 2 (veracity: truth tellers vs. liars) × 2 (reporting condition: AIM technique vs. control) ANOVA was conducted on perceptions of whether the instructions encouraged participants to report more detail. There were no main effects for veracity, reporting condition, or for veracity × reporting condition, all Fs <3.56, all ps > .06, BF_{10} < 1.05.

3.1 | Hypothesis testing

3.1.1 | Frequency of overall details

A 2 (veracity: truth tellers vs. liars) × 2 (reporting condition: AIM technique vs. control) ANOVA, with overall detail as a dependent variable, revealed a main effect for veracity, $F(1, 104) = 5.33$, $p = .023$, $d = 0.44$, 95% CI [0.05, 0.82]), $BF_{10} = 2.02$, and reporting condition, $F(1,104) = 7.02$, $p = .009$, $d = 0.52$, 95% CI [0.13, 0.90]), $BF_{10} = 4.88$. Truth tellers reported more than liars, and the AIM technique elicited more overall detail than the control condition.

No significant veracity x reporting condition interaction effect was found, $F(1, 104) = 3.74$, $p = .056$, $f = 0.19$, however Bayesian inference shows moderate evidence for the alternative hypothesis, $BF_{10} = 9.33$. As we were interested specifically in the effect of truth tellers versus truth tellers, and liars versus liars, follow up analyses were conducted.

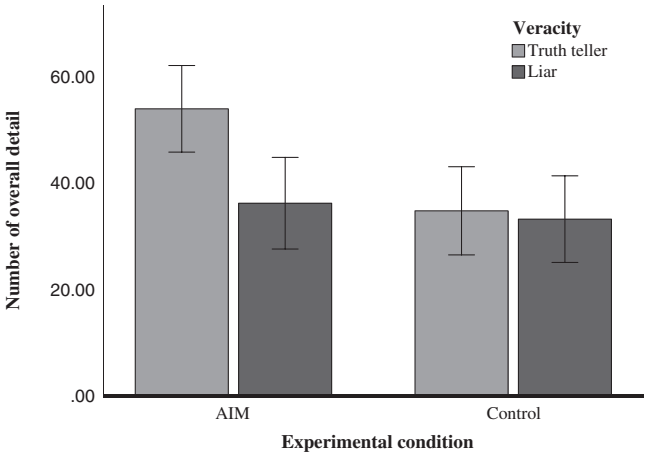

FIGURE 1 Bar graph showing the overall details for truth tellers and liars in the AIM and control conditions. Error bars represent 95% CIs

A follow up t-test revealed that truth tellers reported more overall detail in the AIM condition compared to truth tellers in the control condition, $t(53) = 2.93$, $p = .003$ (one-tailed), $d = 0.79$, 95% CI [0.23, 1.33]. This analysis supports hypothesis 1. Bayesian analysis showed moderate evidence in support of the alternative hypothesis, compared to the null hypothesis ($BF_{10} = 5.13$).

Surprisingly, liars in the AIM condition reported similar amounts of details as liars in the control condition, $t(51) = 0.58$, $p = .281$ (one-tailed), $d = 0.16$, 95% CI [−0.38, 0.70]. Bayesian analysis showed anecdotal evidence in support of the null hypothesis ($BF_{10} = 0.13$). No support for hypothesis 2 was found.

As Figure 1 shows, the AIM condition appears more effective than the control condition for detecting differences between truth tellers and liars.

3.2 | Classification rates

Discriminant analyses tested the ability of "overall detail" to differentiate between truth tellers and liars in the AIM technique and control conditions, as shown in Table 1 below. In all cases, *veracity* was the classifying variable. We present the cross-validated leave-one-out results, as recommended by Kleinberg et al. (2019) as a safeguard against accuracy overestimation in verbal lie-detection research.

Veracity classification was slightly higher in the AIM condition (62.7%), compared to the control condition (56.9%). Our findings partially support Hypothesis 3. The discriminant analysis is here primarily for practitioners and nonspecialised readers.

3.3 | Receiver operating characteristic (ROC) analyses

To complement the series of discriminant analyses (and to formally test Hypothesis 3), we also conducted two ROC analyses for overall

TABLE 1 Discriminant analysis for the frequency of total detail as a function of interview condition

	Accuracy rate truths (%)	lies (%)	Total (%)	Wilks lambda	Chi square	Canonical correlation	*p* value	*F* value
AIM technique	**57.1**	**76.0**	**66.0**	.874	6.78	.36	**.009**	7.33
Control condition	37.0	63.0	55.4	.998	0.09	.04	.767	0.09

Note: Accuracy rates from significant discriminant function appear in bold.

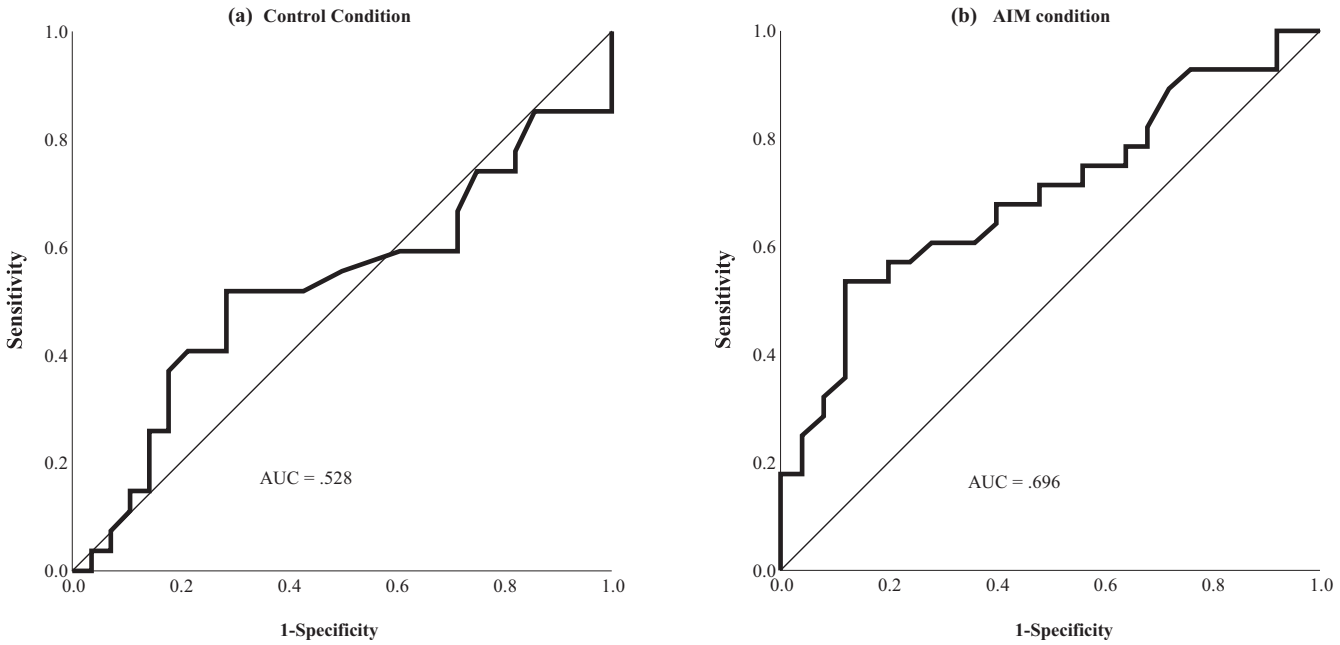

FIGURE 2 (a): ROC curve (with AUC) for overall detail in the control condition. (b): ROC curve (with AUC) for overall detail in the AIM condition

detail, as shown in Figure 2. This is because, unlike discriminant analysis, the Area Under the Curve (AUC) of a ROC curve (with 1—specificity, i.e., false positive rate, plotted on the *x*-axis and sensitivity, i.e., true positive rate plotted on the *y*-axis) provides a measure of the diagnosticity of the criterion as a whole, and allows for a direct comparison of the AIM and control condition. To compute this, we used the method outlined by Hanley and McNeil (1982). As such, we used the calculation of the Standard Error of the Area Under the Curve (AUC) and of the difference between two AUCs. The direct comparison shows that the AIM instructions (AUC = .70, *SE* = .07) were slightly more effective at correctly classifying truthful statements compared with the standard free recall question used in the control condition (AUC = .53, *SE* = .08), $p = .055$. Support for Hypothesis 3 was not found.

3.4 | Discussion

The current study demonstrated that the AIM technique can be applied to online insurance claims settings, with particular focus on supporting truth telling claimants to be more detailed. As predicted, we found that truth tellers provided more information in the AIM condition, compared to truth tellers in the control condition.

One possible explanation for this finding is that the AIM instructions target the metacognitive error that truth tellers' credibility is transparent. According to the 'illusion of transparency', individuals often overestimate the extent to which others can observe their own private mental states (Gilovich et al., 1998). For truth tellers in a situation where they may be accused of lying, often they assume that the investigator will quickly notice their honesty. In the AIM condition, a set of instructions have been devised to notify truth tellers that lie-detection is difficult, and fraud investigators cannot take their credibility for granted. The next set of instructions provide a solution to this problem. This is because truth tellers are further informed that longer, more detailed statements allow more accurate classification. They quickly realise that their credibility is not transparent, and that by complying and providing more information they will more likely be viewed as innocent. This realisation is likely to be what caused a shift in verbal strategies, towards becoming more forthcoming and is consistent with previous findings (Porter et al., 2020).

Liars, in contrast, behaved differently. Liars in the AIM condition were presented with the same set of instructions as truth tellers but developed different verbal strategies. Whereas truth tellers became

more forthcoming, liars provided less information. Specifically, we predicted that liars would withhold more information when presented with the AIM instructions, compared to liars in the control condition. This was not the case. Instead, liars provided a similar level of details to those in the control condition. It is plausible that liars prepared a story before reading the AIM instructions and were not prepared to change their strategy because of this. Another explanation is that liars did not pay sufficient attention to the instructions. In the previous AIM study, Porter et al. (2020) used the instructions in part of an interview setting, whereby the interviewer verbally provided the instructions. Arguably, this makes ignoring the instructions difficult. In the current study participants were asked to read the AIM instructions, but no measures of attention to the task were taken. Future research could investigate this by asking participants to self-report how much attention they paid to the instructions, or by assessing how much of the instructions the participants can remember towards the end of the study. Another method for investigating differences between liars in this study, and liars in the previous study could be by asking them what they think the objectives of the instructions are. This may provide some insight into why the instructions were ineffective at suppressing the amount of information liars disclosed.

The AIM technique is designed to be used in conjunction with the overall detail coding scheme, built from the RM framework (Johnson & Raye, 1981; Vrij, 2008). It is possible that liars use different strategies in response to the AIM instructions, rather than simply withholding information (as suggested in Porter et al., 2020). In the VA, liars provide more uncheckable information as a method to try and avoid detection (Harvey, Vrij, Nahari, et al., 2017; Nahari, Leal, et al., 2014; Nahari, Vrij, et al., 2014b; Palena et al., 2021; Verschuere et al., 2021), especially when an information elicitation tool such as the Model Statement is used (Harvey, Vrij, Leal, et al., 2017). Although, the AIM is designed to assess overall detail (whether checkable or uncheckable) it is plausible that our liars are withholding different *types* of information. It is also possible that liars are providing information that is not relevant to the event as a method for appearing detailed.

In addition to investigating the information eliciting effects of the AIM instructions, we wanted to test whether this technique could enhance lie-detection (using discriminant analysis). Based upon the overall detail provided by the claimants we found some support for the AIM instructions as a lie-detection technique. In practical terms, within the control condition where a standard 'report everything' instruction was used, the accuracy rate was 55.4%, consistent with the literature showing accuracy levels around chance expectancy (DePaulo et al., 2003). In the AIM condition, accuracy levels reached 66.6%, demonstrating a slightly higher accuracy level for correctly classifying truth tellers and liars. We also tested this effect using a more robust method: ROC analyses. Unfortunately, we did not find robust support for the use of the AIM instructions as a lie-detection technique in an online insurance claim setting. This was perhaps due to methodological variations from the original research. The AIM technique was first used in an interview setting whereby participants provided a verbal recall about their recent activities (or lied about them) (Porter et al., 2020). In the current study, participants were asked to either honestly (or deceptively) provide a written statement about an item that they had lost or had stolen in the previous 3 years. This method offered more opportunities for embedding, led to potential memory confounds, and changed the asynchronous delivery of the AIM instructions from their intended use.

It is common in deception research that liars are instructed to report something they have not experienced, and subsequently, they are often given details about what to report (Porter et al., 2018; Vrij, 2008). In the present experiment, we did not give liars such an instruction and instead gave them the freedom to fabricate their own story. As liars prefer to embed their lies in truthful stories (Hogue et al., 2013; Leins et al., 2013; Vrij, 2008), we therefore can assume that many liars did this and described a truthful experience (e.g., a night out with friends) but embedded a lie in that story (e.g., theft of a mobile phone). The finding that liars indicated that on average 24% of their story was truthful suggests that this may be the case. These findings are similar to 15–30% honesty typically reported by liars in insurance claim settings (Harvey, Vrij, Leal, et al., 2017; Harvey, Vrij, Nahari, et al., 2017; Vrij et al., 2016).

Additionally, in this context compared to the original AIM research, lie-telling participants could have more easily embedded their lie within a real memory. In interview settings, such as the one used in Porter et al. (2020), the participants statements have a restricted time and specific location they must discuss (Nahari, 2018; Nahari, Leal, et al., 2014). Such restrictions limit liars' use of embedded lies, making it more difficult for liars to provide a highly detailed account (Nahari, 2018). Our data supports the notion that greater embedding may occur for liars in insurance claim settings, compared to interviews following a recent event. The average reported 'honesty' rating was greater for liars in this study (24%), compared to those in the original Porter et al. (2020) study (18%). Future research should empirically test this assumption.

Furthermore, by asking truth telling participants to recall an item that was lost or stolen in the previous 3 years, we may have introduced a memory confound. The stability bias amongst liars and memory decay amongst truth tellers goes some way towards explain why the AIM instructions were less effective in our study, compared to the original AIM study (Porter et al., 2020). Truth tellers interviewed after a delay typically report fewer details than truth tellers interviewed immediately after a to-be-remembered event, whereas liars provide a similar amount of information irrespective of delay (Harvey et al., 2019; Harvey, Vrij, Hope, et al., 2017; Harvey, Vrij, Leal, et al., 2017; Harvey, Vrij, Nahari, et al., 2017; Izotovas et al., 2018). It is plausible that the stability bias is impacting how effective the AIM instructions are at encouraging truth tellers to report more information. Future research could consider the impact of delay on the technique's effectiveness. This is particularly important as not all lie-detection in insurance domain studies report the length of time from the genuine incident (e.g., Leal et al., 2015; Nahari, Leal, et al., 2014), and those that do often use a 3-year incident period for truth telling participants (e.g., Harvey, Vrij, Leal, et al., 2017; Harvey, Vrij, Nahari, et al., 2017; Vrij et al., 2016) which could be impacting the results.

The use of asynchronous delivery of the AIM may have also impacted (and likely reduced) the techniques effectiveness. The AIM instructions were designed to be used in an interview setting with an oral recall. Instead, the current study used an online survey format to collected typed statements from participants. It is plausible that this format reduced participants willingness to be more detailed, or to really consider the instructions. Our findings support this claim. Participants in Porter et al. (2020) who heard the AIM instruction held a stronger belief that the instructions prompted additional information. In the current study, no differences were found.

According to media richness theory (MRT) face-to-face interactions are a richer mode of communication compared to computer-mediated communication (Daft et al., 1987; Daft & Lengel, 1986; Ishii et al., 2019). This is because face-to-face communication affords instant mutual feedback, the transmission of verbal and nonverbal cues, the availability of natural language and emotion, and a discussion that is exactly tailored to the other communicator. MRT predicts that much of the nonverbal communication that suggests deception is filtered out in the computer-mediated environment. Potentially, lie tellers may also employ different deception strategies in computer-mediated communication. According to Media Synchronicity Theory, communication is composed of two primary processes: conveyance and convergence. Conveyance focuses on the sender's transmission of information which shapes the understanding of the receiver, whereas convergence focuses on clarifying the meaning or understanding of information already exchanged.

When using verbal communication to deceive there appears to be a preference towards a convergence strategy. In contrast, for lie tellers using text-based communication the conveyance strategy is favourable (George et al., 2013). One explanation for this is that text-based communication provides more opportunity for planning. In our study, we focused on examining lie-detection by coding statements for how detailed they appeared. It is plausible that our participants used a convergence strategy and that this would been better detected via a different credibility assessment such as via human ratings. This may explain some of the differences between our (computer-mediated) findings and the original (face-to-face) AIM study. We found that the AIM instructions were generally less effective in this study. Future research could investigative whether the medium in which the statements were collected impacts information elicitation, or whether the instruction delivery is having an effect.

Alternatively, liars may have sufficiently understood the instructions but disregarded them. There are two explanations for this. Firstly, the medium (oral or written) in which individual statements are provided can influence deception cues. This is because written accounts provide more time to think about the content, than when speaking (Sporer, 2016). Secondly, the medium in which the instructions were provided differ. In the original study the instructions were provided verbally (providing less opportunity for comprehension); whereas in the current study the instructions were available online providing an unlimited time in which the participants could use to read and think about the instructions. This might have resulted in liars' meta-cognitive awareness that the investigators were trying to trick them into providing less information. This could explain why AIM liars in the current study reported similar amounts of overall detail to the control liars.

Finally, the quasi-experimental treatment of veracity warrants discussion. By allowing participants to self-select their veracity condition we may have found participants who are better or more comfortable lying, compared to when veracity conditions are allocated by the experimenter. In typical deception research the participants are randomly placed into a truth telling or lie telling condition. Naturally, participants vary in how comfortable and skilled they feel at lying, giving us a more diverse sample. We do not consider this to be problematic as insurance research often used this methodology (Harvey, Vrij, Leal, et al., 2017; Harvey, Vrij, Nahari, et al., 2017; Vrij et al., 2016), and without allowing for self-selection we would have to exclude a large sample of participants. If we randomly allocated veracity conditions, then we would have to exclude truth tellers who have not genuinely lost or damaged item.

In conclusion, we found some support for the application of the AIM technique to insurance settings. The AIM instructions encouraged truth tellers to provide more information (compared to the control condition) but had little effect on liars. We recommend more research is conducted into isolating the components of the AIM instructions before adapting this for use in other settings.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

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

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