

The use of photography to detect deception

‘I’m a Photographer, not a Terrorist’:

The use of photography to detect deception

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Abstract

Purpose. When planning large scale incidents or bombing campaigns, terrorists often conduct reconnaissance research to identify key targets. This may include taking photographs of potential target locations. Identifying an effective real time method to distinguish between genuine photographers and those with more sinister intent may be beneficial for law enforcement and security agencies.

Method. Participants took photographs in a public place with a genuine intent (truth tellers) or sinister intent (liars). After taking these photographs the participants were approached by an undercover interviewer (a mime artist) who asked them whether he could see the photographs. Later, the participants discussed their photographs in a formal interview.

Results. Firstly, liars were less cooperative in their interaction with the undercover interviewer than truth tellers. Secondly, in the formal interview, liars mentioned some security features that appeared in the photographs more than truth tellers.

Conclusion. The findings suggest that using photographs to detect deception is a subject that could prove important to explore to benefit forensic and counter-terrorist practice.

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When planning large scale incidents or bombing campaigns, terrorists often conduct reconnaissance research to identify key targets (Soufan, 2011). This may include taking photographs of potential target locations. Although it is unknown how often terrorists use photography in their missions it is important to note that the police think that they may do, resulting in controversial actions such as asking tourists to delete their photos as a precautionary counter-terrorist measure (Weaver & Dodd, 2009) or asking the public to report photographers to the police (Terrorism Prevention Video asks Public to Report Photographers to Police, 2012).

Identifying an effective on-site method to distinguish between genuine photographers and those with more sinister intent could have multiple benefits. It could give innocent photographers a more secure platform to engage in legitimate activity without fear of being wrongly accused of criminal intent. Perhaps more importantly, it could provide law enforcement officers with the knowledge of how to approach photographers in a manner in which they could reliably determine whether the person could be involved in criminal activity. There are two main ways in which potential criminal intent could be initially gauged in this context: (i) how the photographer reacts to questioning, and (ii) the nature/content of the photographs themselves. We examined both features in the present experiment.

Being openly questioned by the police about the purpose of the photos could have disadvantages for both innocent people and potential terrorists. It could induce panic or stress, but also, anger and resistance in innocent people, as discussions to date illustrate (Weaver & Dodd, 2009). It could make potential terrorists aware that they have been noticed, which could jeopardise an investigation into their network and activities. A potential way to

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avoid these disadvantages is to use undercover interviewers to approach the photographers, i.e., people who appear to be everyday civilians rather than law enforcement officers.

Undercover interviewing may fit particularly well in determining the veracity of an individual's intentions. At the intentions stage, no crime has yet been committed, and a formal interview may therefore be inappropriate. In addition, formal interviews to detect deception are largely anxiety based (Vrij, 2008; Vrij, Granhag, Mann, & Leal, 2011; Vrij, Granhag, & Porter, 2010), adopting the premise that liars will display stronger cues of anxiety than truth tellers. However, truth tellers may also show signs of anxiety when they are interviewed, as a consequence of being suspected of wrongdoing or out of fear of not being believed (Bond & Fahey, 1987; DePaulo et al., 2003). This can render methods that rely solely or primarily on anxiety based detection somewhat ineffective. Therefore employing undercover interviewing, where the suspect does not know they are being interviewed, relies on cues to deceit other than anxiety to identify suspects. Indeed, there is evidence to show that undercover interviewing can elicit differences in responses between truth tellers and liars (Vrij, Mann, Jundi, Hope, & Leal, 2012).

The current study investigates undercover interviewing of photographers who are potentially involved in simulated terrorist activity. In the experiment truth tellers took photographs to promote a city tourist location. Liars took photographs in order to plan planting a decoy device in the same tourist location and, as an alibi, photographs to promote the tourist location. The liars' mission included taking photographs of security features such as possible places to plant a decoy device (bins, toilets, drains and manholes) and to check for security in the area and vantage points that they could be overlooked from (CCTV cameras, windows, rooftops). When the participants left the area after completing their mission they were approached in a non-threatening manner by a confederate posing as a street entertainer

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(a mime artist), who questioned them about their photographs. Later, participants had a formal interview about a selection of the photographs they took.

The introduction of the mime artist was a key manipulation in the study, designed to put liars in a situation that would make it difficult for them to lie effectively and maintain a facade of normal social interaction with a friendly stranger. The mime artist asked photographers if they have photographed him, and whether he could see the photos. Mentioning that they have taken photos of the mime artist will in all likelihood result in a conversation with the mime artist and liars may be reluctant to engage in such a conversation. They may wish to avoid possible questions the mime artist will ask or they may simply not be in a chatty and cooperative mood. Liars often experience more negative affect than truth tellers and this could make them more reluctant to engage in conversations (DePaulo et al., 2003; Mann, Vrij, Shaw, Leal, Ewens, Hillman, & Granhag, 2012; Vrij, Mann, Jundi, Hope, & Leal, 2012). The same reasons may also make liars reluctant to show photographs if asked. We therefore predicted that liars would be less likely to report that they have photographed the mime artist (Hypothesis 1a) and more likely to refuse to show the mime artist their photographs than truth tellers (Hypothesis 1b).

During the interview, truth tellers and liars were shown a selection of the photographs they took. For liars, these were photographs of their 'terrorist mission' and photos of the 'promoting the tourist location' mission. For truth tellers these were only photographs aimed at promoting the square as a tourist destination. Truth tellers and liars were asked to describe what they could see on each of their photographs. Of particular interest is a possible difference between liars and truth tellers in discussing their 'promoting the square' photographs. Given their terrorist mission, liars are likely to have security features in the forefront of their mind when observing and discussing their promotional photographs. According to visual attention models (Wolfe, Klempe & Dahlen, 2000) people's perception

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of a scene is developed by a combination of what they choose to attend to, eye movements and memory. Liars are likely to look at the security features because they remember them clearly and are therefore more sensitive to these features, causing them to detect them more frequently than truth tellers. In addition, people automatically guide their eyes to regions of interest especially those at the forefront of their thoughts (Oliva & Torralba, 2007). In other words, in all likelihood liars will think about the security features when discussing their promotional features and will notice them in their photographs. The Ironic Process Theory (Wegner, 1997) proposes that the most and the least desired effects of attempts to control one's mental state stem from two processes, one of which is the 'ironic monitoring process'. Wegner argues that 'the monitor's effects on mind can supersede those of the operator, producing the very state of mind that is least desired' (p.148). (See also Selective Attention, Cohen, 2006). So liars' intention to avoid mentioning security features in the mission photographs may, unhelpfully for them, trigger an ironic monitoring process which makes it more likely for them to report more security features than truth tellers in the interview (Hypothesis 2). In the experiment we distinguished between security features that liars might consider a risk to mention (bins, toilets, drains, man holes and CCTV cameras) and more innocuous security features (windows and roof tops). We explore whether Hypothesis 2 will particularly hold true for the more innocuous security features as liars may believe that mentioning them will not be harmful to them.

Method

Participants

A total of 80 university students were recruited to participate in the study (52 were female). Participants were recruited with a poster asking for volunteers to take on the role of a secret agent and complete a mission involving photography of a nearby square. The mean

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age was 22.55 ($SD = 6.59$) years. Participants were randomly allocated to the truth ($N = 41$) or lie condition ($N = 31$).

Procedure

Participants arrived at the Psychology Department for a briefing with the experimenter. Truth tellers and liars took part individually and had about 20 minutes to complete the task at Guildhall Square, which is a pedestrianised area local to the university featuring the Guildhall (a building historically used as the meeting place of a guild or corporation), civic offices and a large video screen.

Truth tellers were told that their mission was to promote watching the 2012 Olympics on the large public video screen in Guildhall Square. They were given a camera on which to take photographs for a flyer to promote Guildhall Square as a good place to watch the Olympics. They were told to show the Guildhall and civic offices at their best in order to attract tourists, and were asked to report back to the researcher in 20 minutes to discuss their findings.

Liars were told that they were on a reconnaissance mission for planting a decoy device to disrupt the showing of the Olympics on the Guildhall Square screen. They were informed that they would need to decide where would be the best place to plant a device, and also to check for security within that area. Liars were also provided with a camera and asked to photograph all vantage points that they could be overlooked from, i.e. from which cameras or office windows or roof tops. They also were told to photograph potential device site points including underground locations such as manhole covers or drains. Liars were instructed to remain unnoticed and to avoid alerting anyone to what they were photographing. If asked, they were to use the truth tellers' mission as their cover story, i.e. to state that they were taking promotional photographs of Guildhall Square for a flyer to attract tourists to watch the

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Olympics on the screen. Liars were advised to take photographs appropriate for this reason also. They were then asked to return to the researcher in 20 minutes to discuss their findings.

On entering the square, one subsample of 50 out of the 80 participants (25 truth tellers and 25 liars) encountered a mime artist whose act involved comically impersonating people as they passed through the square. As consent to interact with the mime artist could not practically be sought from the general public, four stooges were employed to be in the square for the mime artist to interact with when the participant arrived.

Apart from impersonating the stooges, the mime artist was also instructed to interact with the participant. As the participant returned to the researcher after completing the photograph taking exercise, the mime artist was situated en route. He approached the participant and asked if they had photographed him. If they answered 'yes', he asked if he could see the photograph, and if they said 'no' or that they weren't sure, he asked if he could check as he thought he was in the background when the participant was taking photographs. The participants' answers to these questions only correlated moderately with each other, $r(50) = .36, p = .011$. The mime artist maintained a friendly and non-accusatory demeanour throughout. The experimenter texted the mime artist and the stooges a description of the participant before s/he arrived at the square so s/he was easily identifiable. The mime artist was not informed about the veracity status of the participant or about the aim of the experiment. We selected the role of a mime artist as mime artists are not directly associated with law enforcement, and we reasoned that being approached by a street entertainer would be plausible to participants and unlikely to raise doubts as to the questioner's integrity.

On their return to the researcher, all participants were told that there had been reports of people planning to plant a decoy device in Guildhall Square and that they were suspected of having being involved with this. They were told that they would be interviewed about their

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claim that they were working on a project to promote watching the 2012 Olympics in Guildhall Square.

The participants' photographs were then downloaded onto a laptop. There was no difference in the number of photographs taken between truth tellers ($M = 17.09$, $SD = 9.47$) and liars ($M = 18.41$, $SD = 11.46$), $F(1,78) = 0.30$, $p = 0.58$, $d = 0.13$. Truth tellers were asked to select the six photographs they deemed best to use for the promotional flyer. Liars were asked to select three photographs that they felt best suited their mission, i.e. illustrating the vantage points and security precautions in place in Guildhall Square. They were also asked to select three photographs that they preferred for their cover story, i.e. promoting Guildhall Square for the Olympics.

To motivate all participants to be convincing during the interview, participants were told that if the interviewer believed they were working on a project to promote Guildhall Square that they would receive £10, and if they were not believed that they would not receive the money but instead would be asked to write a statement explaining their whereabouts. In reality, **for ethical reasons**, all participants received the money and none were asked to write a statement.

The interviewer was blind to the participant's veracity condition, and was given the photographs that had been selected by the participants. The interviewer showed the participant each of the six photographs one by one and asked for each photograph: 'Please describe in as much detail as possible what you can see in the photograph?' In other words, the interview consisted of a single question that was asked six times.

After the interview, the participant was asked to complete a post interview questionnaire. This included the questions 'What do you think the likelihood is of you getting the £10?' and 'What do you think the likelihood is of you writing a statement?' which was

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rated on a scale of 1 (not at all) to 7 (totally). They were also asked whether the interview required a lot of thinking (cognitive effort) and whether it was mentally difficult, on a scale of 1 (certainly not) to 7 (certainly). These two questions correlated positively and significantly with each other, $r(80) = .61$, $p < .0001$, and were averaged. The combined variable was labelled 'cognitive load'. Participants were finally asked to rate how motivated they were to appear convincing during the interview, from 1 (definitely not) to 7 (definitely).

Coding

Photographs Taken By the Participants. A rater reported whether the mime artist was present in any of the photographs. When he was present a score of '1' was given (regardless of how many photographs he appeared in), and if he did not occur in any of the photographs a score of '0' was given.

Interview Coding. Due to a combination of technical and logistical issues only another subsample of 52 of the 80 interviews (29 truth tellers and 23 liars) could be analysed. An independent rater coded the 52 transcribed interviews and photographs discussed during the interview. For each photograph the coder noted the presence of each of the following five suspicious security features: CCTV cameras, toilets, drains, manholes, and bins, and each of the following two innocuous security features: windows and rooftops. Each time a security feature was included in a photograph a score of '1' was given. A total score was created which could range from 0 (none of the features included) to 5 (all five features included) for suspicious security features, and could range from 0 to 2 for innocuous security features.

For each photograph the coder further noted whether the participant reported the presence of the five suspicious and two innocuous security features. Each time a security feature was mentioned a score of '1' was given. A summation scores was created which

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could range from 0 (none of the features mentioned) to 5 (all five features mentioned) for suspicious security features and from 0 to 2 for innocuous security features.

A second coder coded a sample of 15 participants' photographs. The two sets of ratings were compared to assess inter-rater reliability. For features in the photograph (suspicious and innocuous combined) Intra Class Coefficient = 0.95, and for mentioning the features in the interview ICC = 0.89.

Apart from whether the features were present in the photographs and were reported, we also calculated the ratio between the two: features reported divided by features present. The ratio score could range from 0 to 1 whereby a 1 would mean that all features that were present in the photograph would be reported by the participant.

A third rater, blind to the veracity condition, coded all photographs discussed in the interviews and judged how good/appealing the photograph makes the square look (1 very poor to 7 very good), and how prominent the suspicious and innocuous features were in each photograph (1 not at all to 7 very prominent). A fourth coder coded a sample of 15 participants' photographs discussed during the interviews. The two sets of ratings were compared to assess inter-rater reliability. For appeal the ICC = 0.67, for prominence of suspicious features ICC = 0.62 and for prominence of innocuous features ICC = 0.89.

Results

Manipulation Checks

Truth tellers ($M = 5.27$, $SD = 1.48$) believed there was a greater likelihood that they would receive the money than liars ($M = 3.97$, $SD = 1.84$), $F(1, 78) = 12.03$, $p = 0.001$, $d = 0.78$; and truth tellers ($M = 2.88$, $SD = 1.73$) believed there was less likelihood of having to write a statement than liars ($M = 3.92$, $SD = 1.82$), $F(1, 78) = 6.86$, $p = 0.011$, $d = 0.58$. Truth tellers ($M = 3.26$, $SD = 1.53$) also reported experiencing less cognitive load during the interview than liars ($M = 4.45$, $SD = 1.28$), $F(1, 78) = 14.22$, $p < 0.0001$, $d = 0.85$. There was

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no difference between truth tellers ($M = 5.93$, $SD = 0.96$) and liars ($M = 5.92$, $SD = 0.98$) in how motivated they claimed they were to appear convincing during the interview; $F(1,78) < 0.0001$, $p = 0.986$, $d = 0.01$. These mean scores (almost 6 on a 7-point scale) suggest that both truth tellers and liars were highly motivated.

Hypotheses testing

Data were analysed with Chi-square analyses or analyses of variance with Veracity (truth versus lie) as the only factor. In addition, we carried out some analyses of covariance with Veracity as factor and the prominence of features as a covariate.

Cooperation with the Mime Artist. A similar percentage of truth tellers (76%) and liars (72%) had taken a picture of the mime artist, $\chi^2(1, N = 50) = .10$, $p = .750$, $\Phi = .05$, but truth tellers (36%) were more likely than liars (8%) to tell the mime artist that they had taken a picture of him, $\chi^2(1, N = 50) = 5.71$, $p = .017$, $\Phi = .34$.¹ In addition, truth tellers (60%) were significantly more likely than liars (20%) to allow him to see the photograph ($\chi^2(1, N = 50) = 8.33$, $p = .004$, $\Phi = .41$). This supports Hypothesis 1. In fact, 82% of those who told the mime artist that they had taken a photograph of him were truth tellers; and 75% of those who allowed the mime artist to look at the photographs were truth tellers.

Table 1 about here

Reporting Photograph Features during the Interview. Table 1 indicates that liars' and truth tellers' promotional photographs were rated as equally appealing. Liars reported more suspicious security features than truth tellers. However, the suspicious features were more prominent in the liar's promotional photographs. Indeed, when we controlled for how prominent the suspicious features were (in an analysis of covariance), the differences between liars and truth tellers in reporting them were no longer significant. In contrast, although the number of innocuous features did not differ between the liars' and truth tellers' photographs, liars reported them more, even when we controlled for how prominent the

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innocuous features were in the photographs. This supports Hypothesis 2. Table 1 (ratio scores) also shows that most of the suspicious and innocuous features that were on the photographs were not reported. When we considered how many participants reported security features, it was found that 48% of liars and 21% of truth tellers reported at least one suspicious or innocuous security feature. This association between mentioning security features and veracity was significant, $\chi^2(1, N = 50) = 4.29, p = .038, \Phi = .29$, and again supports Hypothesis 2.

Table 2 about here

Liars' Mission and Promotional Photographs Comparison. Table 2 indicates that liars' promotional photographs were rated as more appealing than their mission photographs. In addition, the suspicious, but not the innocuous, security features were more prominent in the mission photographs than in the promotional photographs. The number of suspicious security features did not differ between liars' mission and promotional photographs, but liars reported such features more when discussing the mission photographs. Indeed, when we controlled for how prominent the suspicious security features were (in an analysis of covariance), differences in reporting these features in the mission and promotional photographs disappeared. No differences emerged regarding the innocuous security features, which incidentally were largely unreported (low ratios).

Discussion

In the present experiment participants took photographs in a public place with either a genuine intent (truth tellers) or sinister intent (liars). We examined how these participants responded when stopped by a mime artist and when they were (later) interviewed about the photographs they had taken. Given a dearth of empirical research pertaining to terrorism behaviour and tactics (see Silke, 2008), this experiment paves the way for future work examining the behaviour of those seeking to conceal malicious intent in a terrorism context.

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Cooperation with the Mime Artist. Although similar percentages of truth tellers and liars photographed the mime artist, liars were more reluctant to admit to photographing the mime and to allow him to see the photographs. This suggests that liars were less likely to comply with external requests than truth tellers. Similar findings have been reported by Vrij, Mann, Jundi, Hope and Leal (2012) in a study where an undercover interviewer who posed as a University student conducting a survey or a photography student asked truth tellers and liars whether he could take a photograph of them. More truth tellers than liars complied with his request. We believe that ‘cooperation’ with an undercover interviewer has potential as a diagnostic cue to deceit. Interestingly, the cue ‘cooperation’ may be relevant particularly to undercover interviews. In more formal interviews, liars will probably realise that lack of cooperation may appear suspicious and they therefore may be more willing to cooperate in formal than in undercover interviews.

One could argue that the finding that similar percentages of truth tellers and liars took photographs of the mime artist was unexpected. Liars often deem it necessary to minimise the number of potential witnesses to their activity (Granhag & Hartwig, 2008; Nahari, Vrij, & Fisher, 2012). Indeed research has shown that liars include fewer witnesses in their drawings of recalled events than truth tellers (Vrij, Leal et al., 2010; Vrij, Mann, Leal, & Fisher, 2012). Vrij and colleagues have argued that witnesses could provide accounts of the liars’ suspicious behaviour, and liars prefer to distance themselves from any potentially incriminating information, termed the ‘avoid and escape’ strategy (Granhag & Hartwig, 2008). The fact that so many liars (72%) have photographed the mime artist could be down to a practical issue. The space liars were instructed to photograph was limited, and the mime artist was freely mobile within the space. In order to attain the necessary photographs, liars may have been compelled to on occasion include the mime artist in the photographs too. Alternatively, they may have been so focussed on the mission and the parts of the square they wanted to

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photograph that they did not even notice the mime artist.ⁱⁱ Finally, the mime artist was a prominent and enjoyable presence at the square and perhaps liars realised that he could feature well in their promotional photographs.

Reporting Security Features during the Interview. The dedicated promotional photographs from truth tellers and liars did not differ in terms of appeal, which demonstrated that liars succeeded in taking convincing photographs for their cover story. Yet, the way they discussed these promotional photographs in the formal interview served to highlight their deception. Although the number of suspicious security features did not differ between liars' and truth tellers' promotional photographs, liars reported them more frequently. This may be a tactical move by liars. When suspicious security features are prominent in the promotional photographs, failing to address them may have looked suspicious. This is supported by the finding that when the prominence of suspicious security features were controlled for there was no longer a significant difference between liars and truth tellers in reporting them.

Although the number of innocuous security features did not differ between the liars' and truth tellers' promotional photographs, liars reported them more frequently, even when we controlled for how prominent the innocuous security features were in the promotional photographs. The fact that liars discussed innocuous security features more than truth tellers when discussing the promotional photographs is interesting given that liars took effort to hide the aim of their mission (indicated by the low ratios of reporting innocuous as well as suspicious security features in the mission photographs). Future research should examine the relationship between actively concealing information and ironic processes which may lead to the subsequent hyper-accessibility of the concealed or suppressed information (see Wegner, 1994). This information may become difficult for the liar to continue to inhibit or conceal in a challenging interview.

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Methodological issues. A few methodological issues merit attention. First, in the present experiment many truth telling participants were willing to show their photos to the mime artist, but the question remains how likely it is that real tourists would do this. We cannot answer this question on the basis of the current data but other research suggests that tourists are willing to do this. In Vrij et al. (2012) tourists were approached at a hovercraft terminal by an undercover interviewer in the guise of an amateur photographer or as a University doctoral student conducting a tourism and travel survey. He asked the tourists several questions, including whether they could mark on an unmarked/non-annotated map of the island they were about to visit, the locations on that island they were planning to visit; and whether they would mind having a photo taken that he could put up on his website. In this encounter, the tourists were very cooperative. Nearly all tourists who were approached were willing to be interviewed. All tourists who were interviewed marked locations on the map and 81% allowed him to take a picture.

Regarding lying, in real life suspects who are on a reconnaissance mission may be less willing to show their photographs to a mime artist than our liars were. If this would be the case, it would strengthen our conclusion that those with a genuine intent are more willing to cooperate with an undercover interviewer than those with a sinister intent.

Second, we used a student sample - mainly consisting of females - which raises questions concerning the generalizability of the findings to real terrorists. We can only speculate about this issue but we have a few reasons to believe that we can generalise these findings in certain terrorism contexts, at least. To start with, in real life individuals have posed as students when engaged in terrorist activities. In fact, in the UK many universities were accused of being 'the breeding grounds of terror' in a Government report. Further, Anthony Glees, a Professor of Politics at the University of Buckingham (UK), argued in *The Telegraph* as a response to that

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report that the evidence that British student campuses have become hotbeds of Islamist radicalisation is overwhelming (Glees, 2011).

. More importantly, deception studies with student participants often show findings similar to what has been found in real life settings. For example, in his book *the Black Banners* Ali Soufan, an experienced American FBI interrogator who has interrogated numerous al-Qaeda suspects, argued that for lie detection purposes it is beneficial to ask spatial questions as liars appear to have trouble answering such questions (Soufan, 2011). The utility of spatial questions is well-documented in research literature. For example, in a laboratory experiment, using a (mainly female) student sample, examining the efficiency for lie detection purposes of asking spatial (as well as other types of) questions Vrij and colleagues (2009) found that spatial questions in particular were useful for lie detection. This finding was also replicated in an experiment using a child sample (Roos af Hjelmsäter, Öhman, Granhag, & Vrij, in press).

Third, during the interview truth tellers discussed six photographs they deemed best to use for their promotional flyer, whereas liars discussed only three photographs that they selected for their promotional flyer (liars also discussed three photographs that referred to their true mission.) This means that comparisons between truth tellers' and liars' promotional photographs were based on six photographs from truth tellers and three photographs from liars. We made these comparisons for two main reasons. Firstly, we wanted truth tellers and liars to discuss the same number of photographs. However, since liars had to discuss photographs relating to two tasks (to promote a square and for planting a decoy device), whereas truth tellers discussed photographs of only one task (to promote a square), it necessarily meant that liars discussed fewer promotional photographs than truth tellers. In addition, since liars had to carry out two tasks during their mission compared to truth tellers only one, this means that the liars' mission was the most difficult mission. As a methodological compromise, we decided that liars had to select and discuss three of their

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promotional photographs. If their task had involved selecting the same number of promotional photographs as truth tellers, and if the liars' promotional photographs had been of lesser quality than truth tellers' promotional photographs, it could have been argued that this was due to the fact that they had to select so many photographs relative to the attention they could pay to the promotional task.

Fourth, we asked all participants to select six photographs and asked in the interview only one question about each photograph. Of course, we could have asked participants to select more photographs and we could have asked more questions about each photograph. However, that would have made the interviews longer and even more repetitive than they already were, which easily could have led to fatigue and/or boredom effects.

Future research. The use of (i) undercover interviewers and (ii) photographs to detect deceit are two new areas in deception research, and future research could shed more light on their efficacy in lie detection. Regarding undercover interviewing, future research could draw upon the persuasion literature and could examine whether specific actions by the undercover interviewer could enhance cooperation amongst those who are approached by the undercover interviewer. In particular, actions should be examined that are likely to enhance the willingness to cooperate more in truth tellers than in liars, and, as such, will make cooperation a stronger and more diagnostic cue to deceit. Regarding photography, in the present experiment the participants carried out a specific mission, and future research should examine whether similar differences between truth tellers and liars in discussing photographs emerge when they discuss different types of photographs.

Implications Undercover interviewing could be useful in sensitive situations. If the photographer is innocent, some friendly questions about their photographs by an undercover interviewer are unlikely to cause wariness or unease. As we discussed earlier, it has been shown in a previous study where tourists were approached by an undercover interviewer in a

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casual and personable manner, and nearly all proceeded to speak with him (Vrij et al., 2012). If the photographer has illicit intentions, it also may be preferable for an undercover interviewer to approach them rather than an identifiable law enforcement official who may cause them to react suddenly either on their own or by alerting accomplices, which could have potentially catastrophic consequences.

We appreciate that ethical considerations need to be made when undertaking undercover investigations. The 1950 European Convention for the Protection of Human Rights and Fundamental Freedoms (ECHR), states that ‘Everyone has the right to respect for his private and family life, his home and his correspondence’ (Article 8(1)). This is further qualified by Article 8(2) in its assertion that ‘There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary... in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime... or for the protection of the rights and freedoms of others’ (Convention for the Protection of Human Rights and Fundamental Freedoms as amended by Protocols No. 11 and No. 14). Therefore investigators deploying undercover operations must ensure that in the likely event of breaching Article 8(1), the operation is lawful and pursuant to legitimate aim, as outlined in Article 8(2) (Harfield & Harfield, 2005).

Conclusion

Liars were less cooperative than truth tellers in discussing their photographs with an undercover interviewer. When discussing the photographs in a formal interview liars reported the innocuous security features more frequently than truth tellers. The findings suggest that using photographs to detect deception is a subject that could prove important to explore to benefit forensic and counter-terrorist practice.

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References

- Bond, C. F., & Fahey, W. E. (1987). False suspicion and the misperception of deceit. *British Journal of Social Psychology*, 26, 41-46.
- Cohen, A. (2006). Selective Attention. *Encyclopedia of Cognitive Science*: Wiley
- Convention for the Protection of Human Rights and Fundamental Freedoms as amended by Protocols No. 11 and No. 14. Retrieved from <http://conventions.coe.int/Treaty/en/Treaties/Html/005.htm>
- DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenburck, L., Charlton, K., & Cooper, H. (2003). Cues to Deception. *Psychological Bulletin*, 129(1), 74-118.
- Glees, A. (2011). *Universities: The breeding grounds of terror*. The Telegraph, 6 June 2011, <http://www.telegraph.co.uk/education/universityeducation/8560409/Universities-The-breeding-grounds-of-terror.html>
- Granhag, P. A., & Hartwig, M. (2008). A new theoretical perspective on deception detection: On the psychology of instrumental mind-reading. *Psychology, Crime & Law*, 14, 189-200.
- Harfield & Harfield (2005). *Covert Investigation*: Oxford University Press
- I'm a Photographer, not a Terrorist! Retrieved from <http://photographernotaterrorist.org/>
- Mann, S., Vrij, A., Shaw, D. J., Leal, S., Ewens, S., Hillman, J., Granhag, P. A. and Fisher, R. P. (2012), Two heads are better than one? How to effectively use two interviewers to elicit cues to deception. *Legal and Criminological Psychology*.
- Nahari, G, Vrij, A & Fisher, R. (2012) Does the truth come out in the writing? SCAN as a lie detection tool. *Law and Human Behavior* 36, 68-76.
- Oliva, A. & Torralba, A. (2007). The role of context in object recognition. *Trends in Cognitive Sciences*, 11(12): 520-527.

The use of photography to detect deception

Roos af Hjelmsäter, E., Öhman, L., Granhag, P. A., & Vrij, A. (in press). Mapping" deception in adolescents: Eliciting cues to deceit through an unanticipated spatial drawing task. *Legal and Criminological Psychology*, 19, 179-188. DOI: 10.1111/j.2044-8333.2012.02068.x

Silke, A. (2008). Research on terrorism: A review of the impact of 9/11 and the global war on terrorism. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (2008). *Terrorism informatics: Knowledge management and data mining for homeland security* (pp. 27-49). New York: Springer.

Soufan, A. H. (2011). *The black banners: The inside story of 9/11 and the war against al-Qaeda*. New York: W. W. Norton & Company.

Terrorism Prevention Video asks Public to Report Photographers to Police (2012) Retrieved from <http://www.petapixel.com/2012/08/09/terrorism-prevention-video-asks-public-to-report-photographers-to-police/>

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

Vrij, A., Granhag, P. A., Mann, S., & Leal, S. (2011). Outsmarting the Liars: Towards a Cognitive Lie Detection Approach. *Current Directions in Psychological Science*, 20(1), 28-32.

Vrij, A., Granhag, P. A., & Porter, S. (2010). Pitfalls and opportunities in nonverbal and verbal lie detection. *Psychological Science in the Public Interest*, 11, 89-121.

Vrij, A., Leal, S., Granhag, P. A., Mann, S., Fisher, R. P., Hillman, J., & Sperry, K. (2009). Outsmarting the liars: The benefit of asking unanticipated questions. *Law and Human Behavior*, 33, 159-166.

Vrij, A., Leal, S., Mann, S., Warmelink, L., Granhag, P. A., & Fisher, R. P. (2010). Drawings as an Innovative and Successful Lie Detection Tool. *Applied Cognitive Psychology*, 24, 587-594.

The use of photography to detect deception

Vrij, A., Mann, S., Jundi, S., Hope, L., & Leal, S. (2012). Can I take your picture? Undercover interviewing to detect deception. *Psychology, Public Policy, & Law*, *18*, 231-244.

Vrij, A., Mann, S., Leal, S., & Fisher, R. P. (2010). 'Look into my Eyes': Can an Instruction to Maintain Eye Contact Facilitate Lie Detection? *Psychology, Crime and Law*, *16*(4), 327-348.

Weaver, M. & Dodd, V. (2009, April 16th) Police delete London tourists' photos 'to prevent terrorism' *www.guardian.co.uk*

Wegner, D. M. (1994). Ironic Processes of Mental Control, *Psychological Review* *101*(1), 34–52.

Wegner, D. M. (1997). Why the mind wanders. In J. D. Cohen & J. W. Schooler (Eds.), *Scientific approaches to consciousness*, 295-315.

Wolfe, J.M., Klempen, N., & Dahlen, K. (2000) Post-attentive Vision. *The Journal of Experimental Psychology: Human Perception and Performance*, *26*(2), 693-716.

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Table 1. Interview Results as a Function of Veracity

	Truth tellers' promotion (N = 29)		Liars' promotion (N = 23)				
	M	SD	M	SD	F	p	d
	Photograph's appeal (7 point scale)	3.20	.79	3.12	.94	.09	.76
Photographs- suspicious features prominent (7 point scale)	2.21	.71	2.83	1.33	4.65	.036	0.61
Photographs- innocuous features prominent (7 point scale)	4.02	1.0	3.66	1.11	1.41	.24	0.33
Number of suspicious features in photograph	1.64	.57	1.49	.67	.68	.41	0.24
Number of suspicious features reported	.01	.04	.14	.24	8.48	.005	0.93
					3.82	.056	
					1		
Ratio of suspicious features reported to suspicious features photographed	.006	.02	.11	.22	5.93	.02	0.87
					1.26	.27	
					1		
Number of innocuous features in photograph	1.46	.37	1.30	.44	1.92	.17	0.39
Number of innocuous features reported	.03	.08	.13	.24	4.45	.04	0.63
					5.58	.02	
					2		
Ratio of innocuous features reported to	.02	.05	.11	.21	5.05	.03	0.69

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innocuous features photographed	5.71	.02
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2

¹ Controlled for the suspicious features being prominent in the promotion photographs via an analysis of covariance

² Controlled for the innocuous features being prominent in the promotion photographs via an analysis of covariance

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Table 2. Liars' Interview Results as a Function of Type of Mission

	Liars mission		Liars promotion		F	p	d
	(N = 23)		(N = 23)				
	M	SD	M	SD			
Photographs appeal (7 point scale)	2.11	.79	3.12	.94	13.41	.001	1.16
Photographs suspicious features prominent (7 point scale)	4.15	1.42	2.83	1.33	9.95	.005	0.96
Photographs innocuous features prominent (7 point scale)	3.93	1.28	3.66	1.11	.56	.46	0.23
Number of suspicious features in photograph	1.14	.68	1.49	.67	3.90	.06	0.52
Number of suspicious features reported	.32	.31	.14	.24	4.34	.049	0.67
					0.57 ³	.46	
Ratio of suspicious features reported to suspicious features photographed	.38	.40	.11	.22	7.55	.01	0.87
					0.93 ³	.35	
Number of innocuous features in photograph	1.07	.56	1.30	.44	2.17	.16	0.46
Number of innocuous features reported	.23	.32	.13	.24	1.89	.18	0.36
Ratio of innocuous features reported to innocuous features photographed	.23	.31	.11	.21	2.09	.16	0.46

³Controlled for the suspicious features being prominent in the mission and promotion pictures

ⁱ **Eight truth tellers and eight liars who did not say ‘yes’ to this question, did not say ‘no’ either but said ‘I am not sure’. One could argue that the latter answer does not completely show lack of cooperation. We re-ran the analysis, taking out the 16 participants who said ‘I am not sure’, and thus only included the 34 participants who answered ‘yes’ or ‘no’. Still significantly more truth tellers (53%) than liars (12%) said ‘yes’, $\chi^2(1, N = 34) = 6.59, p = .010, \Phi = .44$.**

ⁱⁱ **If liars did not notice the mime artist, their answer that they did not take a picture of him cannot be seen as lack of cooperation. However, their reluctance to show the mime artist their photos could still be seen as lack of cooperation, because this is not dependent on whether they thought they made a picture of the mime artist.**