



Eliciting cues to deception by tactical disclosure of evidence: The first test of the Evidence Framing Matrix

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Purpose. Research on real-life suspect interviews shows that disclosure of evidence is a very common tactic and that it occurs in all phases of the interview. It is therefore remarkable that there is hardly any research on the effectiveness of different disclosure tactics. The aim of this study was to examine the effects of three different disclosure tactics: presenting the evidence early and two versions of the Strategic Use of Evidence (SUE) technique.

Methods. For the SUE-Basic technique (SUE-B), the evidence was disclosed late in the interview. For the SUE-Incremental technique (SUE-I), we used a stepwise disclosure tactic derived from the so-called Evidence Framing Matrix. The tactic consists of revealing evidence of increasing strength and precision. A mock-theft scenario was employed with 195 participants who were randomly allocated to one of six conditions: guilty or innocent suspects were interviewed with one of the three techniques. Two measures of inconsistency were used as dependent variables: statement-evidence inconsistency and the newly developed within-statement inconsistency.

Results. By interviewing with SUE-I, strong cues to deception were elicited, especially for the statement-evidence inconsistency variable. For the SUE-B, significant but smaller differences between guilty and innocent suspects were obtained.

Conclusions. We found that both *when* and *how* the evidence was disclosed moderated the effectiveness of disclosure. With respect to *when*, it was more effective to disclose the evidence late (vs. early), and with respect to *how*, it was more effective to disclose the evidence in a stepwise (vs. direct) manner. The tactical aspects of evidence disclosure are discussed.

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Recent years have seen an upsurge of interest in research on deception and its detection (Vrij, 2008). Within this field there is a new wave of research focusing on strategic ways of interviewing suspects in order to elicit cues to truth and deception (Vrij, Granhag, Mann, & Leal, 2011). This new line of research is in contrast to the typical way of studying people's deception detection performance, in which observers – passively and without any form of background information – watch and assess short video clips depicting low-stakes lies for which there are few cues to deception and truth (the outcome of studies on high-stakes lies might reveal reliable deception cues, e.g., Porter & ten Brinke, 2010). Research on the Strategic Use of Evidence (SUE) technique is one example of the new wave of research.

In many real-life situations, the interviewer has some sort of critical information (evidence) pointing to the suspect's guilt. Hence, it is important to know how this evidence should be used during the interview in order to elicit cues to deception and truth. The SUE-technique rests on the theoretically driven assumption that liars and truth tellers have different counter-interrogation strategies (Granhag & Hartwig, 2008). In essence, empirical research shows that guilty suspects (falsely denying guilt) use much more aversive strategies with respect to the critical information, whereas innocent suspects (truthfully denying guilt) use more forthcoming verbal strategies (Hartwig, Granhag, & Strömwall, 2007; Kassin, 2005; Strömwall, Hartwig, & Granhag, 2006). The SUE-technique has proven successful in eliciting cues to deception for both lying adults (Hartwig *et al.*, 2011) and lying children (Clemens *et al.*, 2010), as well as for suspects lying about their past actions (Hartwig, Granhag, Strömwall, & Vrij, 2005) and for suspects lying about their intentions (Clemens, Granhag, & Strömwall, 2011). In one study, police trainees at an academy in Sweden were taught to use some basic elements of the SUE-technique. The results showed that participants who had received training in the technique clearly outperformed their untrained colleagues; 85% versus 56% deception detection performance (Hartwig, Granhag, Strömwall, & Kronkvist, 2006).

As argued by Granhag (2010), the SUE-technique is best described as consisting of a strategic level and a tactical level. The strategic level is the more abstract and contains the case-independent and general principles underlying the SUE-technique (for more on this set of principles, see Granhag & Hartwig, 2008). The tactical level is the more concrete, and contains a package of different case-dependent and specific tactics. It is possible to identify three groups of tactics: (1) evidence tactics, (2) question tactics, and (3) disclosure tactics (Granhag, 2010). These tactics are important both for the planning of the interview and during the actual interview. The tactics are used to assess the evidence, to systematically exhaust the alternative explanations that a guilty suspect might have to the evidence, and to disclose the evidence in the most effective manner (Granhag & Vrij, 2010). Importantly, all these tactics are derived from the conceptual framework underlying the SUE-technique (the strategic level). To this date, the tactical level of the SUE-technique is underdeveloped compared to the strategic level (Granhag, 2010). The aim of this paper is to remedy this by examining the effectiveness of different tactics used for disclosing the evidence. By effectiveness we mean the number and strength of cues that discriminate truth and deception.

Disclosure of evidence

A few sources may be informative about evidence disclosure during interviews with suspects. However, interrogation manuals seem to be either silent on how and when to disclose the available evidence (e.g., Gordon & Fleisher, 2002), or recommend that

the interrogation is started by confronting the suspect with the evidence (e.g., Yeschke, 1997). Consulting research on real-life interrogations, the first conclusion to be drawn is that there is not much research on this topic. A study by Leo (1996) showed that disclosure of evidence (together with an assertion of guilt) was the typical way to begin interrogations in a US sample. In fact, this combination occurred in more than 80% of the interrogations studied. A British study by Moston and Engelberg (1993) paints a different picture by showing that in only a minority of the cases studied (12%) was the evidence disclosed at the outset of the interrogation. A study by Hartwig, Granhag, Strömwall, and Vrij (2004), examining 30 experienced police officers – each interviewing a mock suspect on the basis of a brief case file – showed a large variation in terms of the officers' interviewing style, including when and how the evidence was disclosed. Recently, Soukara and colleagues conducted a series of studies examining the frequency and timing of different interrogation tactics. In one study analysing 80 police interviews, they found that disclosure of evidence occurred in 79 of these (Soukara, Bull, Vrij, Turner, & Cherryman, 2009). In another study, Bull and Soukara (2010, Study 4) showed that disclosure of the evidence occurred during all phases of the 40 interviews examined. They found that disclosure of evidence was more common late in the interview compared to early (for later phases it occurred for 100% of the interviews examined, and during the first 5 min it occurred in 37% of the interviews). In sum, disclosure of evidence is very common during suspect interviews and it seems to occur in all phases of the interview.

In yet another line of research, scholars have investigated the effects, in terms of cues to deception and deception detection accuracy, following different forms of disclosure. The results are somewhat mixed. Dando and Bull (2011) showed that disclosing the evidence either in a drip-feeding manner (gradual revelation) or at the end of the interview (late revelation) was more effective in detecting liars than disclosing the same evidence early. They also found that disclosing the evidence in a drip-feeding fashion was more effective than disclosing the same evidence late. Unfortunately, Dando and Bull did not analyse cues to deception, so on the basis of this study it is difficult to state what method of evidence disclosure was more effective in producing verbal differences between liars and truth tellers. In contrast, Sorochinski and colleagues (2011) found that withholding the evidence to the end produced more pronounced verbal differences between liars and truth tellers (in the form of statement-evidence inconsistency) compared to when the same evidence was released in a drip-feeding manner. The early disclosure of evidence tactics produced the weakest cues to deception. Further research is needed in order to resolve the issue of how different pieces of evidence should be disclosed in order to elicit diagnostic cues to deception and/or facilitate observers' deception detection performance.

Both studies reviewed above focused on situations in which the interviewer held several different pieces of evidence. In contrast, the present study focuses on how to most effectively disclose one piece of evidence. Specifically, we were interested in the effects of *when* the evidence is disclosed (e.g., early vs. late), as well as in the effects of *how* this single piece of evidence is disclosed. To our knowledge, the latter question has not been addressed in previous research.

Granhag (2010) proposed that when one piece of evidence is disclosed, two different dimensions are particularly helpful in illuminating the many framing alternatives that may exist. The first dimension is the *strength of the source of the evidence*, which can vary from weak to strong. The second dimension is the *degree of precision of the evidence*, which can vary from low to high. These dimensions are perhaps best illustrated via an example. Consider a situation in which the interviewer has CCTV footage showing

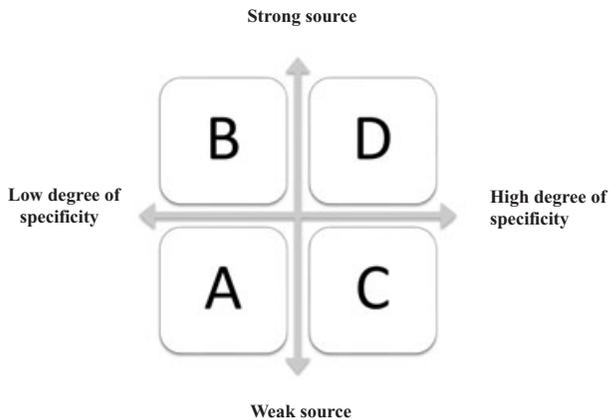


Figure 1. *The Evidence Framing Matrix.* Explicating the different framing options for one piece of evidence by relating the dimensions strength of source and specificity of the evidence (adopted from Granhag, 2010).

how the suspect buys a suitcase of the same model and colour as one later found containing bomb material. The interrogator can frame this evidence in several different ways. The source of the evidence can be framed as weak ('we have information telling us that . . .') or as strong ('we have CCTV footage showing us that . . .'). The specificity of the evidence can be framed as low ('. . . you visiting a luggage store') or as high ('. . . you buying a particular suitcase'). Importantly, the source and specificity dimensions can be related orthogonally, resulting in a construct explicating the different alternatives with respect to how a singular piece of evidence can be framed. Granhag (2010) labelled this construct the *Evidence Framing Matrix* (see Figure 1). In its most simple version, this matrix results in four different quadrants. Quadrant A represents the *most indirect* form of framing; weak source/low specificity ('we have information telling us that you recently visited a luggage store') and quadrant D represents the *most direct* form of framing; strong source/high specificity ('we have CCTV footage telling us that you recently bought a particular suitcase'). Quadrants B and C represent the intermediate levels. It should be noted that the Evidence Framing Matrix is by no means limited to the four framing options marked in Figure 1. In a real investigation one piece of evidence may be placed at different positions for each dimension, resulting in a multitude of different framing options.

Based on the psychology of guilt and innocence, and that guilty (vs. innocent) suspects will practice more aversive strategies with respect to the critical evidence (Granhag & Hartwig, 2008), we argue that disclosing the evidence in a stepwise (incremental) manner, starting from quadrant A (weak source/low specificity), then passing quadrant B and/or quadrant C, before ending up at quadrant D (strong source/high specificity), will be more effective than opting for direct disclosure (quadrant D without passing any other quadrant). In essence, we predict that a stepwise (incremental) disclosure of the evidence will result in lying suspects having to change their story in order to make their statement fit the evidence as it is revealed to them. This recurrent change of the statement will show in terms of within-statement inconsistency, which will be one additional cue to deception. Expressed differently, we expect that the stepwise disclosure of evidence may force liars to sacrifice within-statement consistency in order to maintain consistency with the evidence.

The present study

In this paper, we advance previous research by examining the effects of three different ways of disclosing one single piece of evidence. To our knowledge, this issue has not been addressed in previous research. We compared two versions of the SUE-technique with a control technique in which the evidence was disclosed at the outset of the interview (Early Evidence). For both versions of the SUE-technique the evidence was disclosed late in the interview, after which the interviewer had tried to exhaust alternative explanations to the evidence. In the SUE-Basic technique (SUE-B), we used direct disclosure of the evidence (quadrant D in Figure 1), whereas in the SUE-Incremental technique (SUE-I) the evidence was disclosed in a stepwise manner derived from the Evidence Framing Matrix (starting from quadrant A, moving to quadrant D via quadrant B). We examined the extent to which each disclosure tactic was successful in eliciting two different cues to deception. The first cue was statement-evidence inconsistency that refers to the degree of consistency between the suspect's statement and the evidence that the interviewer holds (the higher the inconsistency, the more this speaks to that the suspect is lying). The second cue was within-statement inconsistency that refers to the degree to which the suspect has changed key aspects of his/her statement that pertain to the evidence (the higher the inconsistency, the more this speaks to that the suspect is lying).

Our hypotheses for the statement-evidence inconsistency variable were a main effect for suspect veracity (higher scores for guilty suspects), a main effect for interview type (higher scores for SUE interviews than for Early Evidence interviews), and most importantly an interaction effect in which the SUE conditions were expected to differentiate innocent and guilty suspects more than the Early Evidence interview (Hypotheses 1–3).

Similarly, for the within-statement inconsistency variable, we expected to obtain a main effect for suspect status (higher scores for guilty suspects). Furthermore, we expected a main effect for interview type (higher scores for SUE interviews than for Early Evidence interviews). First and foremost, though, we hypothesized an interaction effect showing the largest difference between innocent and guilty suspects for the SUE-I interview, a smaller difference for the SUE-B interview, and no difference for the Early Evidence interview (Hypotheses 4–6).

Method

Participants

Participants in the study were 195 individuals: 129 women and 66 men. Their age varied from 18 to 65 years ($M = 26.50$, $SD = 8.59$). Students were in majority: 156 participants were students, 21 reported to currently be working, and 16 reported to neither be working nor studying. The participants were recruited through advertisements on several locations in Gothenburg City: the University of Gothenburg, libraries, and cafés. Participation was voluntary and each participant received compensation in the form of one cinema ticket (worth approximately €11).

Design and procedure

We employed a 2 (Suspect status: Guilty vs. Innocent) \times 3 (Interview: SUE-I vs. SUE-B vs. Early Evidence) between-subjects design. Participants were randomly allocated to one of the six conditions. Half were instructed to visit a bookstore and steal a specific book (Guilty suspects). The other half of the participants were asked to visit the same bookstore and find out the price of the book (Innocent suspects). Once they returned

from the bookstore, they were interviewed with one of the three interviews: Early Evidence, SUE-B, or SUE-I. The dependent variables were the degrees of statement-evidence inconsistency and within-statement inconsistency.

First instructions

A floor plan over the bookstore was shown to each participant. The shelf in which the specific book (the DSM-IV-manual in mini paperback format) could be found was marked on the floor plan. It was pointed out to everyone – irrespective of suspect status – that the owners of the store were informed of the study and that the DSM-IV-manual belonged to the experiment leader and had been planted in the store. In addition, participants were shown a map over the local area in order to easily find their way to the bookstore.

Guilty suspects were instructed to carry out the theft in an inconspicuous manner as if it was an authentic theft, and to not show the stolen book to anyone else but the experimenter when asked for it. Eleven participants refused to carry out the theft and were instead offered to find out the price of the book, which they all agreed to; hence, they were reallocated to the Innocentsuspect condition.

These instructions lasted about 5–10 min. Participants were instructed to not stay longer than 10 min in the bookstore, and to be back at the department (where the instructions and interviews took place) within 20 min from leaving.

Pre-interview instructions

Before being interviewed, all participants were informed both verbally and in writing that they were suspected of having committed a theft and that they were going to be interviewed. Innocent suspects were instructed to tell the truth about what they had done in the bookstore. Guilty suspects were instructed to deny the theft; hence, to lie about what they had done in the bookstore. Regardless of suspect status, all received information that there was no point in denying visiting the store since that fact already had been established. The rationale behind this information was that we wanted all statements to concern events taking place in the store.

In order to increase motivation to be convincing, all participants were informed that they could win five additional cinema tickets if they managed to convince the interviewer that they had not committed the theft. The pre-interview instructions phase lasted 3–4 min and everyone was thereafter given about 10 min to prepare their story before being interviewed.

The interviews

Two research assistants were trained in how to conduct the interviews, and carried out half of the interviews each. They followed scripted protocols (see Appendix) and were blind to the suspects' veracity and to the experimental hypotheses.

One piece of evidence was said to exist for all suspects: video camera surveillance footage from the bookstore showing the suspect crouching in front of the shelf from which the book had been stolen, and touching the books on that shelf.¹

¹In fact, the bookstore did not have surveillance cameras. However, because many stores in the area use such techniques, it was not an implausible assertion. Not one of the participants challenged the statement.

All interviews began with an introduction phase in which the interviewer introduced themselves and informed the interviewee that he or she was suspected of having committed a theft. All interviews included phases of free recall, specific questions and disclosure of the evidence, and a closing phase in which the interviewer asked if the suspect wanted to add anything before ending the interview. The interviews were audiotaped and lasted between 5 and 15 min.

Early evidence

In this condition, all the evidence was presented to the suspect before the free recall, and the suspect was asked to respond to the evidence. Then, the suspect provided a free recall of what had happened during the visit in the store. The free recall was followed by specific questions before closing.

SUE-Basic

In this condition, all the evidence was presented after the free recall and the specific question phase. The suspect was then asked to respond to the evidence just before closing the interview.

SUE-Incremental

This condition differed from SUE-B in one aspect: the disclosure of evidence was conducted incrementally. That is, unlike the SUE-B interview, the questions about the evidence were presented in increments of strength of source and degree of specificity. In addition, during the disclosure phase, the suspects were asked specific questions regarding the evidence; hence, not only asked to respond freely to the evidence, but to first answer certain specific questions related to the evidence. Then, the evidence in full was disclosed to the suspect as in SUE-B and the suspect was asked to respond. The differences between the three interview types are clarified in the Appendix.

Post-interview questionnaire

After being interviewed, the participants filled out a questionnaire including questions about the extent to which the participant had been truthful during the interview, and to what extent they had been motivated to convince the interviewer. The answers were provided through ratings on 7-point scales. Additionally, there were questions about age, gender, and occupation.

Coding procedure

The interviews were transcribed verbatim and then coded for statement-evidence inconsistency and within-statement inconsistency. All coders were blind to the veracity of the suspects and to the hypotheses. A total of 48 statements were randomly selected for inter-rater reliability purposes. Once an acceptable inter-rater agreement had been achieved, one person coded all statements for statements-evidence inconsistency, and another person coded all statements for within-statement inconsistency.

Statement-evidence inconsistency

Statement-evidence inconsistency was rated by two coders on a 7-point scale. This scale ranged from 1 (*the statement is inconsistent with the evidence to a very low degree*) to 7 (*the statement is inconsistent with the evidence to a very high degree*). An intra-class correlation (ICC) was calculated, showing an agreement of .68, 95% CI [-0.04, 0.78].

Within-statement inconsistency

The extent to which the suspects changed their statement with regard to the evidence was assessed by two other coders by using a 5-point rating scale: 0 (*the statement is not at all changed*) to 4 (*the statement is changed substantially*). The ICC was .87, 95% CI [0.76, 0.93].

Results**Manipulation check and preliminary analyses**

The innocent suspects ($M = 6.61$, $SD = 0.62$) reported having told the truth to a higher extent than the guilty suspects ($M = 4.26$, $SD = 1.57$), Welch's $t(127.01) = 13.78$, $p < .001$, $d = 1.98$. Hence, the participants complied with the instructions. Guilty ($M = 5.94$, $SD = 1.17$) as well as innocent ($M = 5.69$, $SD = 1.25$) suspects reported high motivation to convince the interviewer that they were telling the truth, and the difference was not significant, $t(193) = 1.44$, $p = .15$, $d = 0.21$.

Hypotheses-testing analyses

A 2 (Suspect status: Innocent vs. Guilty) \times 3 (Interview: SUE-I vs. SUE-B vs. Early Evidence) MANOVA with statement-evidence inconsistency and within-statement inconsistency as dependent variables was conducted. On the multivariate level, all effects were significant: The main effect of Suspect status, $F(2, 188) = 158.53$, $p < .001$, $\eta_p^2 = 0.63$, the main effect of Interview, $F(4, 378) = 6.36$, $p < .001$, $\eta_p^2 = 0.06$, and the Suspect status \times Interview interaction, $F(4, 378) = 2.88$, $p = .02$, $\eta_p^2 = 0.03$. Therefore, we continued with univariate analyses separately for the dependent variables.

Statement-evidence inconsistency

The 2 (Suspect status: Innocent vs. Guilty) \times 3 (Interview: SUE-I vs. SUE-B vs. Early Evidence) ANOVA with statement-evidence inconsistency as dependent variable showed significant results for all three effects, as predicted (Hypotheses 1-3). Guilty suspects ($M = 5.67$, $SD = 1.35$) were more inconsistent than innocent suspects ($M = 2.39$, $SD = 1.34$), $F(1, 189) = 316.68$, $p < .001$, $\eta^2 = 0.63$. The significant effect of Interview, $F(2, 189) = 7.59$, $p = .001$, $\eta_p^2 = 0.07$, was followed up with Bonferroni *post hoc* tests indicating a significant difference between SUE-I ($M = 3.62$, $SD = 2.26$) and SUE-B ($M = 4.49$, $SD = 2.07$), $p < .001$. None of the SUE conditions were different from the Early Evidence condition ($M = 4.02$, $SD = 1.97$), $ps > .10$. The significant Suspect status \times Interview interaction, $F(2, 189) = 3.13$, $p = .046$, $\eta_p^2 = 0.03$, was further examined with simple effects tests comparing the scores for innocent and guilty suspects within each interview type. In the Early Evidence condition, guilty suspects ($M = 5.38$, $SD = 1.41$) were more inconsistent than the innocent suspects ($M = 2.70$, $SD = 1.49$), $F(1, 189) = 70.29$, $p < .001$, $\eta^2 = 0.37$. In the SUE-B condition, guilty suspects ($M = 6.15$, $SD = 0.97$) were also more inconsistent than the innocent suspects ($M = 2.78$, $SD = 1.34$), $F(1, 189) = 112.23$, $p < .001$, $\eta^2 = 0.59$. Finally, guilty suspects ($M = 5.48$, $SD = 1.52$) were more inconsistent than the innocent suspects ($M = 1.69$, $SD = 0.74$) in the SUE-I condition, $F(1, 189) = 140.33$, $p < .001$, $\eta^2 = 0.74$. Comparing the effect sizes showed support for Hypothesis 3: by interviewing with SUE-I and SUE-B larger differences between guilty and innocent suspects were elicited.

Within-statement inconsistency

The tendency of suspects to alter elements of their story during the interview was examined. Among the guilty suspects, 24 of 98 (24.5%) changed some aspects. Among the innocent suspects, not one changed their version. The difference was significant, $\chi^2(1, N = 195) = 27.09, p < .001, \phi = 0.37$.

The 2 (Suspect status: Innocent vs. Guilty) \times 3 (Interview: SUE-I vs. SUE-B vs. Early Evidence) ANOVA with within-statement inconsistency as dependent variable also showed significant results for all three effects, as predicted (Hypotheses 4–6). The main effect of Suspect status, $F(1, 189) = 23.38, p < .001, \eta^2 = 0.11$, showed that guilty suspects ($M = 0.37, SD = 0.76$) were more inconsistent than innocent suspects ($M = 0, SD = 0$). The significant effect of Interview, $F(2, 189) = 3.87, p = .023, \eta_p^2 = 0.04$, was followed up with Bonferroni *post hoc* tests showing a significant difference between SUE-I ($M = 0.32, SD = 0.73$) and Early Evidence ($M = 0.06, SD = 0.39$), $p = .015$. None of these conditions were different from the SUE-B condition ($M = 0.17, SD = 0.52$), $ps > .29$. The significant Suspect status \times Interview interaction, $F(2, 189) = 3.87, p = .023, \eta_p^2 = 0.04$, was further examined with simple effects tests within each interview type. In the Early Evidence condition there were no difference between the guilty suspects ($M = 0.13, SD = 0.55$) and the innocent suspects ($M = 0, SD = 0$), $F(1, 189) = 0.97, p = .33, \eta^2 = 0.005$. In the SUE-B condition, guilty suspects ($M = 0.33, SD = 0.67$) were more inconsistent than the innocent suspects ($M = 0, SD = 0$), $F(1, 189) = 6.48, p = .01, \eta^2 = 0.03$. Finally, guilty suspects ($M = 0.64, SD = 0.93$) were more inconsistent than the innocent suspects ($M = 0, SD = 0$) in the SUE-I condition, $F(1, 189) = 140.33, p < .001, \eta^2 = 0.74$. Comparing the effect sizes showed strong support for Hypothesis 6: by interviewing with SUE-I, the largest difference between guilty and innocent suspects emerged. For the SUE-B interview, a significant but smaller difference was found, and by interviewing with the Early Evidence technique, no difference in within-statement inconsistency between guilty and innocent suspects was elicited.²

Discussion

The aim of the present study was to examine the effects of different disclosure tactics with respect to one piece of evidence. One of the tactics tested was derived from the Evidence Framing Matrix. To examine such tactics is important as disclosure of evidence does occur in most suspect interviews (Bull & Soukara, 2010), but the amount of research on the effectiveness of different disclosure tactics is meagre. We found that both *when* and *how* the evidence was disclosed moderated the number and strength of cues to truth and deception. Below we will discuss the results and implications of this study in detail.

The Evidence Framing Matrix

At the core of this paper is a proposed matrix, the *Evidence Framing Matrix* (Granhag, 2010), illuminating how one single piece of evidence can be framed at the point of disclosure. The matrix consists of two independent dimensions that are related

²A word of caution is necessary in interpreting the findings for the within-statement inconsistency, since most statements were scored as consistent.

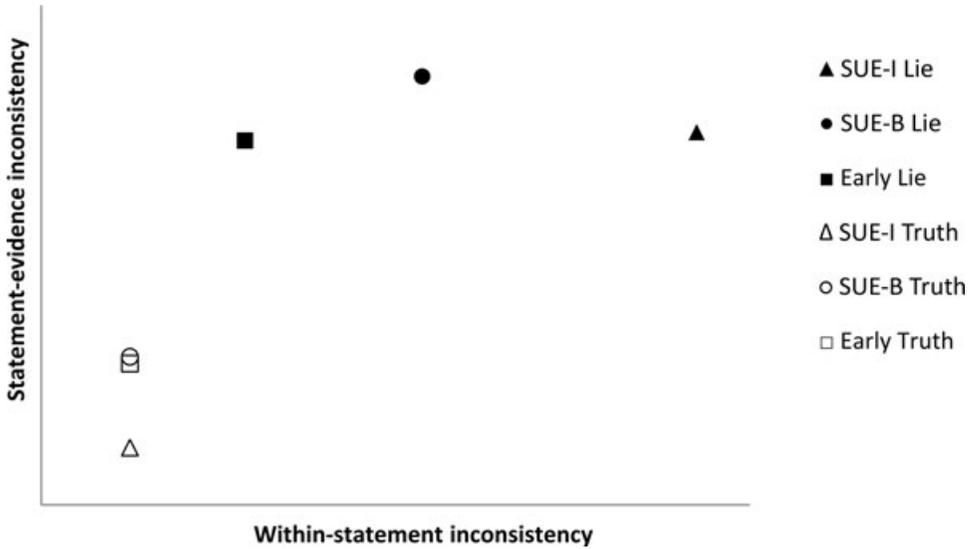


Figure 2. The relation between the two inconsistency measures: statement-evidence inconsistency and within-statement inconsistency.

orthogonally. The first dimension is the *strength of the source of the evidence*, which can vary from weak to strong. The second dimension is the *degree of precision of the evidence*, which can vary from low to high. The purpose of the matrix is to explicate the different framing options that are at the interviewer's disposal for a singular piece of evidence. The applied value of the matrix needs to be assessed by systematic empirical tests, and the present paper was the first such test.

A new dress for the present results

We used two measures to tap the effectiveness of the different disclosure tactics examined. The first measure was the degree of statement-evidence inconsistency, which has been used in a number of previous studies (e.g., Clemens *et al.*, 2010; Hartwig *et al.*, 2005). The second measure was the degree of within-statement inconsistency, which was new and developed for the present study. Relating these two measures a new light can be cast on our results. Figure 2 shows a graph illuminating the relation between liars and truth tellers within each interview condition. The further apart the truthful and lying suspects are within an interview condition, the more effective the disclosure tactic. Ideally, truth tellers should end up in the lower left region; showing a low (or zero) degree of statement-evidence inconsistency and low (or zero) degree of within-statement inconsistency. Liars, on the other hand, should ideally be placed in the upper right region; exhibiting a high degree of statement-evidence inconsistency and a (relatively) high degree of within-statement inconsistency. Indeed, Figure 2 shows that liars in the SUE-I condition are found in the upper right corner and truth tellers in the SUE-I condition are found in the lower left corner of the graph, suggesting that the SUE-I technique shows promise as a lie-detection method.

In addition, we believe that two observations are worth to highlight. First, for all three interview conditions, liars (vs. truth tellers) show a much higher degree of statement-evidence inconsistency. We believe this finding to be rather impressive considering

there was only one piece of evidence disclosed to the suspects (in previous SUE studies there have been more than one piece of evidence). In brief, we believe that this finding speaks to the robustness of this particular cue to deception. Second, for the two SUE conditions, liars exhibited a higher degree of within-statement inconsistency than truth tellers. Importantly, this pattern is much less pronounced – and non-significant – in the Early Evidence condition. Also of importance, the differences obtained for the within-statement inconsistency measure were smaller due to low variation. We trust that future research will continue developing this new measure in order to find a more sensitive manner in which to tap inconsistencies within statements.

The results of this study show that there is much more to the SUE-technique than disclosing the evidence late. That is, by combining two different disclosure tactics, (1) late disclosure and (2) incremental disclosure, we were able to elicit two different cues to deception. Furthermore, our study shows that the SUE-technique is not limited to situations in which there are several pieces of evidence, but that the technique can be used also when there only is one piece of evidence speaking to the suspect's guilt. In brief, the general principles behind the SUE-technique can be translated into different tactics fitting different circumstances.

Juxtaposing the two measures tapping disclosure tactic effectiveness, it stands clear that the absolute differences between liars and truth tellers were more pronounced for statement-evidence inconsistency than for within-statement inconsistency. The immediate interpretation might be that statement-evidence inconsistency is the more important measure. Although this interpretation might be correct, we want to warn against putting one measure against the other. We have at least two arguments for why we think caution is needed. First, to use an elaborate disclosure tactic tapping *only* statement-evidence inconsistency might be a serious mistake. For example, a guilty suspect confronted with the evidence in a stepwise manner (i.e., from a less to a more direct form of framing) might have to recurrently change his statement in order to make it fit with the evidence revealed. The suspect's final statement will then match the evidence rather well (i.e., with a relatively low degree of statement-evidence inconsistency). In such a case it is the development of the statement over time that is of interest (i.e., the degree of within-statement inconsistency). If a guilty suspect prioritizes low statement-evidence inconsistency – and if s/he is exposed to the incremental disclosure tactic – s/he might have to pay the price of a relatively high degree of within-statement inconsistency (which might undermine the credibility). Second, it was only the lying suspects who exhibited any (albeit low) degree of within-statement inconsistency. This is important as it makes the cue easy to use: if some degree of within-statement inconsistency is found, then the person is probably lying. Needless to say, only future research can tell whether such a straightforward use of the cue is motivated. Our message is that both cues should be acknowledged and used, and that they may work in tandem to catch lying suspects. Our study shows that both measures discriminated significantly between liars and truth tellers in both SUE conditions. Importantly, both measures are of importance in both investigative and judicial settings (e.g., de Keijser, Malsch, Kranendonck, & de Gruiter, 2011; Greuel, 1992; Soukara *et al.*, 2009).

Although the proposed Evidence Framing Matrix might be used without any theoretical understanding of why it elicits diagnostic cues to deception and truth, we believe it is important to acknowledge its theoretical underpinnings. The SUE-technique rests on the theoretically driven (Granhag & Hartwig, 2008) and empirically supported (Hartwig *et al.*, 2007) assumption that guilty suspects (liars) use much more aversive counter-interrogation strategies than innocent suspects (truth tellers). The fact that liars and

truth tellers have different counter-interrogation strategies can be exploited in several ways. One such way is to first systematically exhaust the alternative explanations a liar might have to the evidence, and then disclose the evidence. As demonstrated in past research (Hartwig *et al.*, 2005), liars' aversive strategies – characterized by avoidance and denial – will then result in a relatively high level of statement-evidence inconsistency. As the present study shows, another way to use the fact that liars and truth tellers have different counter-interrogation strategies is to disclose the evidence in an incremental manner: moving from an indirect form of framing (weak source/low precision) to the most direct form of framing (strong source/high precision). The aim of this disclosure tactic is twofold: (1) to allow liars to play out their more aversive counter-interrogation strategies (resulting in relatively high degree of within-statement inconsistency), and (2) to allow truth tellers to use their more straightforward counter-interrogation strategies (resulting in relatively low, or zero, degree of within-statement inconsistency).

Practical applications and limitations

We believe that the results of the current study have both immediate and wide-ranging practical implications. First, the Evidence Framing Matrix is to our knowledge new, and we believe that it can be of assistance during the planning of interviews with suspects. That is, the matrix explicates the different framing options that are available, and the investigator can use the matrix for deciding on how to best disclose the evidence. Second, our empirical tests show that an incremental disclosure of the evidence is to prefer over a direct disclosure. Hence, not only does the current paper offer a matrix as a tool for tactical deliberation on the framing of the evidence, it further offers advice on the most effective way to frame the evidence.

Furthermore, our study focused on how to frame one single piece of evidence, but the results are not limited to situations where the interviewer holds only one piece of evidence. Our results are also relevant for situations in which there are several pieces of evidence, each having been assessed differently in terms of their potential weight. The interviewer may then decide to use the more effective tactic for one piece of evidence (assessed as high in potential weight) and to take different routes in terms of disclosure for the remaining pieces of evidence (assessed as lower in potential weight).

One limitation of the present study pertains to the use of the proposed model for framing the evidence. The diverse framing options only occur if an investigator holds a piece of evidence characterized by a rather strong source and/or a relatively high degree of specificity. That is, an incremental disclosure tactic can only be used if the original piece of evidence leaves room for moving from a more to a less strong source and/or from a higher to a lower degree of specificity. A piece of evidence that is – in its original shape and form – characterized by a weak source and which is low in specificity will be very difficult to disclose in an incremental manner. On a more positive note, the proposed matrix will make clear to the interviewer which evidence allows for an incremental disclosure and which evidence that does not.

A second limitation is that the disclosure used in the SUE-I condition covered only three of the four possible quadrants of the Evidence Framing Matrix (quadrants A, B, and D, see Figure 1). It should however be underscored that our major aim was not to conduct a test of all possible combinations of the Evidence Framing Matrix, but to compare one tactical combination derived from the matrix against two other tactics. Future research should address the value of other tactical combinations resulting from the Evidence Framing Matrix.

Conclusions

The present paper advances the research on deception detection and police interviewing on several accounts. First, we introduced a novel matrix that helps to illuminate the many options that exist with respect to how a single piece of evidence can be framed at the point of disclosure. Second, we introduced a new dependent measure to map evidence disclosure effectiveness: within-statement inconsistency. Third, we replicated the findings from past SUE research by showing that late disclosure of the evidence (after exhausting alternative explanations to the evidence) is more effective than early disclosure. Fourth, our study advances and sharpens the SUE technique by showing that not only should the evidence be disclosed late, but that it also pays off to move from a less to a more direct framing when disclosing the evidence. In brief, our study showed that the most effective disclosure tactic was a result of having considered both *when* and *how* to disclose the evidence.

Finally, we would like to acknowledge that disclosure of evidence is a complex issue, which demands tactical reasoning beyond the timing and framing of the evidence. For example, in situations in which the interviewer holds several pieces of evidence it is very unlikely that each of these pieces will carry the same potential weight. For example, to have the suspect contradict one particular piece of evidence might be much more diagnostic for deception than having the same suspect contradict a different piece of evidence. Hence, the interviewer has to be rather naïve to employ the same disclosure tactic with respect to each and every piece of evidence. Instead, and in order to reduce the risk that the suspect reads the tactic used (see Sorochinski *et al.*, 2011), the interviewer may be advised to use one particular disclosure tactic for some (less important) pieces of evidence, and to use a different tactic in order to maximize the effects of other (more important) pieces of evidence. We consider tactical aspects of the disclosure of evidence an important avenue for future research.

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Appendix

Interview templates with the three different techniques (translated from Swedish)

Early Evidence

1. Introduction
2. Disclosure of evidence: “We know that you have been in that room and touched the books in that specific shelf. We know this since the bookstore has video camera surveillance. The recording shows you crouching in front of this specific shelf, touching these specific books. So, what is your explanation to this?”
3. Free recall
4. Specific questions
5. Closure

SUE-Basic

1. Introduction
2. Free recall
3. Specific questions
4. Disclosure of evidence: “We know that you have been in that room and touched the books in that specific shelf. We know this since the bookstore has video camera surveillance. The recording shows you crouching in front of this specific shelf, touching these specific books. So, what is your explanation to this?”
5. Closure

SUE-Incremental

1. Introduction
2. Free recall
3. Specific questions
4. Disclosure of evidence: “We have information saying that you went into this room. Can you explain what you did in that room? Three specific questions about what the suspect did in the room (e.g., in which shelves the suspect had been looking for books). “You have been seen in front of this shelf. Can you explain what you did in front of this certain shelf?” One or two specific questions about what the suspect did in front of the shelf (e.g., how high and low the suspect was looking for books in this particular shelf). “We know that you have been in that room and touched the books in that specific shelf. We know this since the bookstore has video camera surveillance. The recording shows you crouching in front of this specific shelf, touching these specific books. So, what is your explanation to this?”
5. Closure