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Police Officers' Perceptions of Statement Inconsistency

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### Abstract

We examined police officers' ( $N = 71$ ) perceptions of statement inconsistency types (within-statement, between-statement, statement-evidence, and within-group inconsistencies).

Approximately half of the officers reported looking for statement inconsistency to detect deception. Officers generally associated contradictions and omissions with deception, and repetitions and reminiscences with truthfulness, but they were most likely to use contradictions. Officers reported using statement-evidence inconsistency more than any other inconsistency type, and they believed it was the easiest type to assess. Younger officers tended to believe that liars attempt to eliminate within-statement inconsistency unless they are strategically presented with incriminating evidence. Moreover, the majority of officers indicated that they have used drawings to assess inconsistencies with suspects' verbal statements. Finally, suspects' criminal history, intelligence, and personality were believed to influence statement (in)consistency. These findings are discussed in light of the literature on statement inconsistency, and recommendations regarding the applied use of statement inconsistency types are offered.

*Keywords:* police officers, inconsistency, survey, legal decision-making

### Police Officers' Perceptions of Statement Inconsistency

According to investigative practitioners, statement inconsistency is one of the most important cues to deception (Akehurst, Köhknken, Vrij, & Bull, 1996; Granhag, Strömwall, & Hartwig, 2005; Greuel, 1992; Strömwall & Granhag, 2003). Despite practitioners' reliance on this cue, research has not focused on how practitioners attempt to detect deception through statement inconsistency or how they perceive different types of statement inconsistency. In the current study, police officers' perceptions and use of different types of statement inconsistency were examined.

There is a general tendency among practitioners and laypeople to perceive consistent statements as truthful, and inconsistent statements as deceptive (Granhag, Andersson, Strömwall, & Hartwig, 2004; Granhag & Strömwall, 2000; Lakhani & Taylor, 2003; Strömwall, Granhag, & Jonsson, 2003; Vrij, Granhag, & Porter, 2010). This consistency heuristic has been empirically refuted as liars are often as consistent as, and sometimes more consistent than, truth-tellers (Granhag & Strömwall, 2002; Granhag, Strömwall, & Jonsson, 2003). These findings may be explained by the 'repeat versus reconstruct' hypothesis (Granhag & Strömwall, 1999), which posits that liars prepare and rehearse their statements for the investigative interview(s), so they can *repeat* the same details within and across interviews. In contrast, truth-tellers provide their statements by recalling information from memory, which is susceptible to omissions (missing or forgetting to report details that were previously reported) as well as reminiscences (recollecting previously unreported details; Fisher, Brewer, & Mitchell, 2009). This ensuing inconsistency is more likely to occur if the event is poorly encoded, if there is a delay between the event and the interview, and/or if there is a delay between the interviews (Cohen, 2001; Harvey, Vrij, Leal, Hope, & Mann, 2017; Tulving & Thomson, 1973). Hence, truth-tellers reconstruct information

when they recall the target event, and that consequently increases their statement inconsistency across interviews (Fisher, Vrij, & Leins, 2013; Odnot, Memon, La Rooy, & Millen, 2013).

### **Types of Statement Inconsistency**

Scholars have examined four types of statement inconsistency (for an overview, see Vredeveldt, van Koppen, & Granhag, 2014): i) within-statement inconsistency (lack of correspondence between details provided by one suspect at different points within a single interview); ii) between-statement inconsistency (lack of correspondence between details provided by one suspect across repeated interviews); iii) statement-evidence inconsistency (lack of correspondence between details provided by a single suspect and available evidence); and iv) within-group inconsistency (lack of correspondence between details provided by different suspects in a single case involving multiple suspects).

Research has demonstrated that simply observing suspects' statement inconsistency does not enhance deception detection (Granhag & Strömwall, 2001b; Vrij et al., 2009). The reason for this is that liars prepare for the interview by anticipating questions that may be asked and rehearsing responses to them (Chan & Bull, 2014; Hartwig, Granhag, & Strömwall, 2007; Vrij, Mann, Leal, & Granhag, 2010). Preparation may enhance liars' consistency and liars may become as consistent as truth-tellers (Granhag & Strömwall, 2002).

However, the interviewer may play an active role in the interview by making the interview more cognitively demanding for liars than for truth-tellers (Vrij, Granhag, Mann, & Leal, 2011). That is, the interviewer may ask questions that disrupt liars' preparations for the interview which will make it difficult for liars to provide spontaneous responses. Liars will have to think of how best to respond to these questions which increases the cognitive load imposed on them and eventually depletes their cognitive resources. If the interviewer asks unanticipated

questions that a liar have not prepared for (Vrij et al., 2009), the cognitive demands of the interview increase. These questions may not be difficult for truth-tellers, because truth-tellers do not need to prepare for the interview as they respond to questions by recalling information from memory (Hartwig, Granhag, Strömwall, & Doering, 2010; Vrij, Mann, et al., 2010). Increasing questions' difficulty for liars but not for truth-tellers elicits verbal cues to deception, such as fewer details and higher statement inconsistency, and thus enhances lie detection (Granhag, Vrij, & Verschuere, 2015; Lancaster, Vrij, Hope, & Waller, 2013; Mac Giolla & Granhag, 2015).

An example of an unanticipated question is asking for a drawing of the alibi location or of the target event (Vrij, Leal, et al., 2010; Vrij, Mann, Leal & Fisher, 2012). Liars tend to find drawings more difficult than truth-tellers, because they have to be detailed and consistent in reporting spatial information (i.e., locating objects in their correct location) they have not prepared. Previous research has shown that drawings are more effective than verbal statements in reducing the number of details, plausibility, and within-group consistency in liars' statements more than in truth-tellers' statements (Vrij et al., 2009; Vrij, Leal, et al., 2010; Vrij, Mann, et al., 2012). Given the ease and efficacy of using drawings (Mac Giolla, Granhag, & Vernham, 2017), they are being increasingly used in investigative interviews (Dando, Wilcock, & Milne, 2009) and accepted as evidence in courts (e.g., United Kingdom; Geiselman 2012; Marlow & Hilbourne, 2011).

Another unanticipated question that liars would not prepare for is asking for a reverse order narration of the target event which reduces the level of within-statement consistency among liars more than truth-tellers (Vrij, Leal, Mann, & Fisher, 2012). Also, introducing unanticipated changes in question format such as asking suspects for a drawing and then for a verbal statement or vice versa (Leins, Fisher, & Vrij, 2012; Leins, Fisher, Vrij, Leal, & Mann,

2011) or asking general questions followed by specific, non-sequentially ordered questions (Deeb et al., 2017) reduces the levels of between-statement consistency, and in some cases within-statement consistency, in liars' statements more than in truth-tellers' statements. Truth-tellers perceive these questions as less difficult than liars, because truth-tellers encode the event along several dimensions so they can recall information from memory along a different dimension (Leins et al., 2012; Vrij et al., 2011). For liars, however, the interview is already taxing given the cognitive load imposed by having to lie. Therefore, asking liars questions different from those for which they prepared would deplete their cognitive resources and ultimately reduce consistency in their statements (Vrij et al., 2009).

Furthermore, the manner in which evidence is presented in the interview is critical to increase the interview difficulty for liars more than for truth-tellers (Hartwig, Granhag, Strömwall, & Vrij, 2005). That is, if evidence is presented early in the interview, liars may find a non-incriminating explanation that is consistent with evidence. However, if evidence is presented strategically after exhausting all explanations for it, liars will find it difficult to maintain statement consistency. The Strategic Use of Evidence (SUE) technique was developed to test these assumptions (Granhag, Vrij, et al., 2015). An interviewer who holds potentially incriminating piece(s) of evidence against the suspect may use the SUE technique. First, the interviewer asks general and specific questions about the relevant event without confronting the suspect with the evidence. After exhausting all possible explanations for the evidence, the suspect is presented with the piece(s) of evidence by first referencing it as weak and imprecise (e.g., there is information showing that the suspect was at the crime scene) and gradually presenting it in a stronger and more precise manner (e.g., there is CCTV footage showing the suspect at the crime scene). Granhag and colleagues showed that the SUE technique is superior

to the early presentation of evidence and elicits significantly more statement-evidence inconsistency, within-group inconsistency, and within-statement inconsistency in liars' than in truth-tellers' statements (Granhag, Rangmar, & Strömwall, 2015; Granhag, Strömwall, Willén, & Hartwig, 2013). Taken together, past research demonstrates the importance of taking the interview protocol into consideration when detecting deception by carefully preparing which questions to ask as well as when and how to ask them.

### **The Current Study**

Previous surveys investigating police officers' perceptions of lie detection have included lists of predetermined verbal and nonverbal cues, which officers rated as indicative of deception or truth (e.g., Akehurst et al., 1996; Strömwall & Granhag, 2003). In such studies, statement inconsistency was repeatedly rated as one of the most important cues to deception with up to 87% of officers agreeing that it is diagnostic of deception (Granhag et al., 2005; Greuel, 1992; Strömwall & Granhag, 2003). Accordingly, we devised a questionnaire that focused specifically on statement inconsistency. We examined how officers perceive different inconsistency types and how these are used to detect deception.

Investigative practitioners generally use the consistency heuristic by presuming that the consistency measure 'repetitions' indicates truthfulness whereas the inconsistency measures (omissions, reminiscences, and contradictions) indicate deception (Fisher et al., 2009, 2013; Granhag et al., 2005). Hence, we expected surveyed officers in our study to associate repetitions with truthfulness and contradictions, reminiscences, and omissions with deception (Hypothesis 1). Moreover, previous research has suggested that officers tend to look for contradictions more than any other (in)consistency measure (Granhag et al., 2005; Masip & Herrero, 2015).

Accordingly, we predicted that officers would report looking for contradictions more than for reminiscences, omissions, or repetitions (Hypothesis 2).

A previous study by Granhag and Strömwall (2001a) revealed that in the presence of repeated statements by a single suspect, laypeople tend to look for between-statement inconsistency more than for within-statement inconsistency. As laypeople and investigative practitioners share similar views on deception cues, including statement inconsistency (Akehurst et al., 1996; Bogaard, Meijer, Vrij, & Merckelbach, 2016; Granhag et al., 2004; Masip et al., 2017; Vrij, Akehurst, & Knight, 2006), we expected officers to report relying more on between-statement inconsistency than on within-statement inconsistency in the presence of different statements from a single suspect (Hypothesis 3).

Statement-Evidence inconsistency is perceived by investigative practitioners as a valid indicator of deception (Granhag et al., 2005; Greuel, 1992; Masip & Herrero, 2015). Hence, we predicted that officers would report looking for statement-evidence inconsistency more than any other type of inconsistency (Hypothesis 4). In line with this hypothesis, we expected them to find it easier to accurately assess statement-evidence inconsistency than any other type of inconsistency (Hypothesis 5).

Officers were asked if they thought that liars who are presented with incriminating evidence, after explanations for it have been exhausted, would be more likely to change their statement to fit it with the evidence or to maintain their statement, risking statement-evidence inconsistency. Previous research has found that police officers in several countries tend to employ the Strategic Use of Evidence technique in investigative interviews (Tekin, Granhag, Strömwall, & Vrij, 2017). The application of this technique is more likely to elicit statement-evidence inconsistency than within-statement inconsistency in liars' statements (Granhag et al.,



2013, Tekin, Granhag, Strömwall, & Vrij, 2016). Accordingly, it was speculated that officers' experience may have made them notice this behavior, so they would report that liars are more likely to be inconsistent with the evidence than within their statements (Hypothesis 6). In line with this hypothesis, we expected officers to report that liars generally attempt to eliminate within-statement inconsistency more than any other type of inconsistency (Hypothesis 7). Officers were not expected to report any differences in the levels of statement inconsistency types for truth-tellers.

We also explored issues not yet empirically examined, but of importance in this context. Questions about these issues were open-ended. At the beginning of the questionnaire (inserted before the closed questions), officers were asked about the verbal cue(s) they were most likely to use to detect deception. Previous research has shown that investigative practitioners use statement inconsistency to a large extent in their decisions (Granhag et al., 2005; Greuel, 1992), so the purpose of this question was to explore the type of inconsistency they were most likely to employ in their decision making. Officers were also asked about their approach to assessing within-statement inconsistency, which may be more difficult to evaluate compared to other inconsistency types. Moreover, officers indicated if and how they implemented drawings in interviews to assess inconsistencies.

Last of all, officers were asked about their perceptions of possible factors (suspects' age, gender, level of education, social class, criminal history, personality, intelligence, race, nationality, and language proficiency) that might influence suspects' statement inconsistency. We are not aware of any study that investigated police officers' perceptions of the effects of suspects' characteristics and backgrounds on statement inconsistency. However, a number of previous studies have examined the effects of these factors on deception detection. One study

found that police officers perceived suspects with a criminal record to be good at lying (Moston & Stephenson, 1992). Suspects acquainted with investigative interviewing have extensive opportunities to receive feedback regarding their behavior which eventually make them good at hiding their lies (Granhag et al., 2004; Granhag, Clemens, & Strömwall, 2009; Hartwig, Granhag, Strömwall, & Andersson, 2004). Also, some studies have shown that police officers erroneously believed that younger children and adolescents are generally poor at controlling their behavior (Vrij, Akehurst, et al., 2006) despite research demonstrating this population is good at behavioral control (Blandón-Gitlin, Pezdek, Rogers, & Brodie, 2005; Gongola, Scurich, & Quas, 2017).

## Method

### Participants

We recruited police officers formally or informally through contacts in police departments in Australia, Canada, and the United Kingdom (UK). Following stakeholders' approvals, the first author or the contacts from the police departments sent an email to police officers in the respective departments to complete a questionnaire about 'police officers' perceptions of cues to deception'. Officers with at least three years of experience in investigative interviewing were eligible to participate. The response rate was 10% for Australian officers, whom the first author contacted. We cannot estimate the response rate by officers in Canada and the UK, because the questionnaire was circulated by the contacts from the respective department, so the original number of recipients cannot be known.

A total of 71 officers completed the questionnaire, of whom 52 were male (73%) and 19 were female (27%). Their age ranged between 31 and 60 ( $M = 41.80$ ,  $SD = 7.13$ ). All were Caucasian except one who was Hispanic. Thirty-eight were from Australia (54%), 17 from the

UK (24%), and 16 from Canada (22%). The majority of Australian officers were detective senior constables ( $n = 22$ ) and detective sergeants ( $n = 13$ ), and three other officers held inspector rank. Among UK officers, 14 were detective constables, one was an inspector, and two did not report their rank. Among Canadian officers, nine were identified as detectives, two as sergeants, three as corporals, and two as constables. Of the total sample, 46 indicated they were native English speakers (65%), 10 spoke English at an advanced level (14%), and one spoke English at the intermediate level (1%). The level of proficiency in English was not obtained for 14 officers in the UK (20%), because the item was added to the questionnaire after it had circulated to those officers (this was the only added item in the questionnaire). However, given new regulations in the UK requiring police officer candidates to be bilingual (Tonkin, 2015), as well as the requirement that non-native police candidates have an English language qualification and complete a training course offered in English (Metropolitan Police, 2018), UK officers would be expected to be proficient in English at least at the intermediate level.

The officers' years of experience in interviewing suspects ranged from 3 to 40 years ( $M = 16.80$ ,  $SD = 7.86$ ). Officers did not consider themselves up-to-date with the scientific literature on statement inconsistency ( $M = 2.57$ ,  $SD = 1.69$ , on a 7-point scale from 1 = *not up-to-date at all* to 7 = *extremely up-to-date*). Although 27 reported being trained in statement inconsistency to detect deception (38%), 44 reported not having received such training (62%). Among officers who reported receiving training, very few were specific about the training they received, with the majority reporting having received basic training at the moderate level (mainly Tier/Level 2 or 3 training). Only nine officers mentioned more specific training such as Criteria-Based Content Analysis (Vrij, 2005), cognitive load interviewing (Vrij, Fisher, & Blank, 2017; Vrij, Jundi, et al., 2012), and the Strategic Use of Evidence (Granhag et al., 2013).

## Questionnaire

We devised a questionnaire based on the existing literature to understand police officers' perceptions of statement inconsistency types and suspects' attempts at eliminating these inconsistencies. The questionnaire was in English and a pilot study with four police officers and eight postgraduate students (four of them worked with investigative practitioners previously) showed that it took approximately 20 minutes to complete. Officers had the option to fill out the questionnaire either online or on paper. Fifty-eight officers (82%) completed the questionnaire online and 13 (18%) on paper. Officers were informed that their responses would be treated confidentially, and they were asked to sign a consent form. Those who completed the online version were instructed that uncompleted questionnaires would be deleted and not included in the analyses.

The questionnaire comprised eight closed questions rated on 7-point scales (see notes in Table 1 for anchors), some of which were followed by open-ended questions to allow officers to expand on their responses. Two other questions on drawings and factors influencing inconsistency were also closed with yes/no response options (and a 'maybe' alternative for the influential factors question) and followed by open-ended questions. In addition, the questionnaire included two exploratory open-ended questions. In the first question, officers were asked about verbal cues they use to detect deception; the aim of this question was to investigate the type of statement inconsistency that will be reported most frequently. The second question explored how officers assessed within-statement inconsistency in single statements by a single suspect. Importantly, definitions of inconsistency types and (in)consistency measures (adapted from Vredeveltdt et al., 2014 and Fisher et al., 2009 respectively) were provided in the questionnaire to clarify them to officers.

## **Coding**

Two coders coded the responses for six open-ended questions. One coder classified all responses into general categories that were data driven (i.e. not predetermined), as shown in Table 2. One of the categories was labelled 'other', because it included themes that were reported by fewer than 8% of the total sample and that could not be classified into one of the other categories. Responses from some officers were allocated to more than one category.

The second coder allocated the responses to the categories adopted by the first coder. The Intra-Class Correlation coefficient, which measures inter-rater reliability between the two coders, for the open-ended questions was .89.

## **Results**

In this section, we first present the results for scale items of the questionnaire along with their follow-up open-ended questions (closed questions subsection). We then report the results of a correlational analysis conducted between years of experience in interviewing, age, and officers' ratings to the closed questions. Lastly, the analyses for the exploratory and open-ended questions are presented (open-ended questions subsection). Table 1 shows the means and standard deviations for the closed questions. Table 2 displays the percentages of responses within categories for the open-ended questions. The analyses for each questionnaire item and the corresponding items in the tables are numbered to make it easier for the reader to follow.

Separate analyses of the data from officers who completed either the online or the paper questionnaire yielded similar results, so we present the combined results of the online and paper questionnaire data. The data-analytic strategy was to conduct repeated-measures ANOVAs comparing the responses on the rated categories, and to follow up with Bonferroni post hoc tests.

For some ANOVAs, the assumption of sphericity was not fulfilled, so the corrected degrees of freedom according to the Huynh-Feldt procedure are reported.

Table 1 about here

## **Closed Questions**

### **1. Police officers' perceptions of (in)consistency measures**

A repeated measures ANOVA showed that officers believed that repetitions, reminiscences, omissions, and contradictions differed significantly from each other,  $F(1.90, 133.31) = 32.83, p < .001, \eta_p^2 = .32$ . The means in Table 1 show that repetitions and reminiscences were generally rated above the scale midpoint of 3.5, meaning that they were associated with honesty, whereas contradictions and omissions, which were rated below this midpoint, were associated with deception. This finding partially supported Hypothesis 1, which posited that officers would associate repetitions with honesty and reminiscences, omissions, and contradictions with deception. Bonferroni post hoc tests revealed that officers believed that contradictions differed from all other measures (all  $ps < .001$ ), reminiscences differed from repetitions and omissions (both  $ps = .002$ ), and omissions differed from repetitions ( $p < .001$ ).

### **2. Police officers' use of (in)consistency measures to detect deception**

A repeated measures ANOVA showed that officers reported significant differences in the extent to which they looked for consistency measures to detect deception,  $F(2.50, 174.99) = 35.74, p < .001, \eta_p^2 = .34$ . Post hoc analyses revealed that officers reported looking for contradictions significantly more than any other consistency measure (all  $ps < .001$ ). They did not differ significantly in the extent to which they looked for other (in)consistency measures (all  $ps > .05$ ). These results supported Hypothesis 2.

### **3. Police officers' perceptions of between-statement inconsistency**

A repeated measures ANOVA revealed that in the presence of different statements from a single suspect, officers reported that they would look for within-statement inconsistency and between-statement inconsistency to the same extent,  $F(1, 70) = 0.44, p = .509, \eta_p^2 = .006$ . Hence, Hypothesis 3, which posited that officers would report looking for between-statement inconsistency more than for within-statement inconsistency, was not supported.

#### **4. Police officers' perceptions of statement inconsistency types**

A repeated measures ANOVA revealed that in cases where officers potentially could assess all types of inconsistencies (i.e., statements by multiple suspects in a single case who are interviewed more than once and against whom incriminating evidence exists), officers reported significant differences in the extent to which they looked for statement inconsistency types,  $F(2.61, 182.95) = 17.89, p < .001, \eta_p^2 = .20$ . Bonferroni post hoc tests revealed that officers reported looking for statement-evidence inconsistency more than within-statement inconsistency between-statement inconsistency and within-group inconsistency (all  $ps \leq .002$ ). Hence, Hypothesis 4 was supported. They also reported looking for within-group inconsistency more than within-statement inconsistency ( $p = .050$ ). No other significant differences emerged.

Follow-up open-ended responses confirmed these findings as 39% of officers reported that statement-evidence inconsistency is the most reliable inconsistency type. Sixteen percent believed that truth-tellers might be inconsistent across interviews due to time lag and forgetting, 14% reported that all inconsistency types are useful, and 8% reported that within-group inconsistency is the least reliable because liars can collude and be consistent or because it is difficult to validate statements in cases where multiple suspects are involved. Officers who generally provided responses from an empirical perspective were more likely to report that liars prepare for the interview, liars may be more consistent than truth-tellers, and truth-tellers may be

more inconsistent across interviews if there is a long delay between event and interview or if multiple interviews are conducted. These officers seemed to believe that (in)consistency measures and types were not valid cues to deception; rather, reasons for any (in)consistency needed to be further investigated and validated with facts to make more informed veracity judgments.

### **5. Police officers' perceptions of the difficulty of assessing inconsistency types**

A repeated measures ANOVA revealed that officers believed that inconsistency types differed significantly in how difficult they are to assess,  $F(2.72, 190.33) = 19.00, p < .001, \eta_p^2 = .21$ . Post hoc analyses indicated that officers found statement-evidence inconsistency significantly less difficult to assess than other inconsistency types (all  $ps < .001$ ), which supported Hypothesis 5. They did not differ significantly in the extent to which they rated the difficulty of assessing other inconsistency types (all  $ps > .05$ ).

### **6. Police officers' perceptions of statement inconsistency following the strategic disclosure of evidence**

A repeated measures ANOVA showed that officers believed that liars who are strategically presented with a piece of evidence would attempt to change their statement to fit it with the evidence (within-statement inconsistency) significantly more than they would stick to their original statement (statement-evidence inconsistency),  $F(1, 70) = 10.77, p = .002, \eta_p^2 = .13$ . This finding refuted Hypothesis 6, which postulated that officers are more likely to believe that liars in these situations would exhibit higher statement-evidence inconsistency than within-statement inconsistency.

### **7. Police officers' perceptions of suspects' attempts at eliminating inconsistency types**



A repeated measures ANOVA showed that officers believed that liars differ in the extent to which they attempt to eliminate within-statement inconsistency,  $F(2.68, 187.79) = 9.09, p < .001, \eta_p^2 = .12$ . Post hoc analyses indicated that they thought liars were significantly more likely to eliminate within-statement inconsistency than between-statement inconsistency, statement-evidence inconsistency, and within-group inconsistency (all  $ps \leq .004$ ). No other significant differences emerged. Another repeated measures ANOVA revealed that officers did not believe that truth-tellers would attempt to eliminate any type of inconsistency more than another,  $F(1.64, 114.79) = 3.08, p = .060, \eta_p^2 = .04$ . These results supported Hypothesis 7.

Officers who responded to the follow-up open-ended question, in which they were able to elaborate on their responses, believed that truth-tellers are generally consistent (29%), maintain within-statement consistency (22%), and/or add information across statements (10%). Some officers considered liars to be generally consistent (22%), whereas others believed that liars are generally inconsistent (6%) or inconsistent across statements (14%). Twenty nine percent reported that evidence is important for liars. Eighteen percent indicated that liars would change their statement to fit it with the evidence, whereas only 4% mentioned that liars would maintain their statement following evidence disclosure.

### **Correlational Analyses**

We conducted a correlational analysis for years of experience in interviewing, age, and officers' ratings to the closed questions. Years of experience and age in were positively correlated,  $r = .84, p < .001$ . Years of experience was also negatively correlated with the belief that repetitions indicate truthfulness,  $r = -.31, p = .008$ , which means that Hypothesis 1 on repetitions may be true for novice officers but not experienced officers. Also, age was negatively

correlated with the belief that liars attempt to eliminate within-statement inconsistency,  $r = -.35$ ,  $p = .002$ , which means that Hypothesis 7 may be only true for younger officers.

Table 2 about here

## **Open-Ended Questions**

### **1. Police officers' use of verbal cues to detect deception**

The most frequently reported verbal cues were the amount of detail (62%) and statement inconsistency (46%). More categories are displayed in Table 2. The 'other' category included infrequently mentioned cues such as repeating questions, denial, and forthcomingness. Among officers specifying the type of statement inconsistency, 40% referred to statement-evidence inconsistency, 36% referred to within-statement inconsistency, and 24% referred to between-statement inconsistency. None of the officers mentioned within-group inconsistency, most probably due to the open-ended nature of this question.

### **2. Police officers' perceptions of within-statement inconsistency**

When determining within-statement inconsistency, officers looked for cues such as the number of details and plausibility of the statement (34%) and contradictions (32%). They also reported using active interview techniques such as asking the suspect for a reverse order narration of events or probing with more in-depth questions to elicit inconsistencies (34%). They noted they may use evidence to corroborate their judgments (by comparing the suspect's statement with evidence [31%] or by confronting the suspect with evidence after exhausting alternative explanations [27%]), see Table 2. The 'other' category included responses such as suspects' refusal to answer and suspects' possible gain from lying.

### **3. Police officers' use of drawings to assess statement inconsistency**

Forty-eight officers (68%) reported using drawings in one or more of their interviews to detect deception. Thirty-four of them (71%) used the drawings to assess statement inconsistencies. Among these 34 officers, 44% compared the drawing with the suspect's verbal statements and 33% compared it with evidence. Table 2 displays more categories. The 'other' category included responses such as using drawings as an additional assessment tool, and considering the effect of delay between the crime and the interview.

#### **4. Police officers' perceptions of possible influential factors on statement inconsistency**

Officers were provided with a list of suspect characteristics and asked if these characteristics influence statement inconsistency. Officers believed that statement inconsistency is influenced by criminal history (65%), intelligence (59%), personality (59%), age (49%), education level (45%), language proficiency (45%), and to a lesser extent by social class (23%), nationality (20%), race (17%), and gender (9%). Officers' elaborations on this question, as shown in Table 2, indicated that they considered suspects with a criminal history to have experience with investigative interviews (30%), which reduces inconsistency. Similarly, intelligence (15%) and certain personality factors (13%) were believed to reduce inconsistency. In contrast, suspects questioned in a second language (33%), young and elderly suspects (18%), and vulnerable suspects (10%) were considered as more susceptible to inconsistency. The 'other' category included other factors that might influence statement inconsistency such as miscommunication when truth-tellers misunderstand the questions but wish to be helpful, and barriers such as unwillingness to disclose intimate issues due to religious reasons.

### **Discussion**

#### **Police Officers' Perceptions of (In)Consistency Measures**

Self-reports by police officers indicated that they tend to use contradictions to assess credibility, and that they are less likely to look for repetitions, reminiscences, and omissions. This finding replicates previous research findings showing that investigative practitioners tend to assess contradictions more than any other (in)consistency measure (Granhag et al., 2005; Greuel, 1992). This may be concerning. Laboratory research has indicated that contradictions rarely occur in suspects' statements (Fisher et al., 2009; Granhag & Strömwall, 2002). Although it might be argued that this past laboratory research involved short interviews with participants and these interviews may have not been long enough to allow inconsistencies, studies examining real criminals' strategies have shown that criminals attempt to withhold information and use their right to silence (Alison et al., 2014; Moston, Stephenson, & Williamson, 1992). If they decide to provide information, that information would be of a non-incriminating nature and consistent throughout the interview (Strömwall & Willén, 2011). Therefore, (in)consistency measures other than contradictions may be more readily available in suspects' statements, and officers need to assess all available measures to understand the reasons for any (in)consistencies before reaching a decision on suspects' veracity. In fact, officers who generally held evidence-based perceptions of lie detection and statement inconsistency were less likely to rely on (in)consistency measures to make judgments and more likely to refer to the context of the case to understand the motivations for any (in)consistency.

Another finding that replicates previous research with practitioners is that officers associated contradictions and omissions with deception and repetitions with truthfulness, in line with the consistency heuristic (Granhag et al., 2004, 2005). It was interesting to find, however, that the more experienced officers were in interviewing, the less likely they were to associate repetitions with truthfulness. This finding implies that experience teaches officers that truth-

tellers may not be able to repeat details in their statements because they reconstruct information from memory, and that liars are capable of being consistent, because they prepare and rehearse for interviews, in line with the repeat versus reconstruct hypothesis (Granhag & Strömwall, 1999). Accordingly, experienced officers seem to hold evidence-based perceptions of suspect behavior.

An unexpected finding was that officers associated reminiscences with truthfulness. Their responses to the open-ended questions may explain this finding. Officers reported that truth-tellers may be inconsistent if there is a delay (time gap) between interviews. While some officers noted the effects of delay on forgetting information, others noted that truth-tellers may add information in subsequent interviews. Hence, officers seemed to be aware of the effects of memory which supports research findings demonstrating that truth-tellers provide additional information across statements, dependent on the questions asked (Cohen, 2001; Ewens, Vrij, Mann, & Leal, 2015; Fisher et al., 2009; Granhag & Strömwall, 2002).

### **Police Officers' Perceptions of Statement Inconsistency Types**

The most frequently reported verbal cues to deception were the amount of detail and statement inconsistency which replicates findings by previous studies (e.g., Granhag et al., 2005; Strömwall & Granhag, 2003). A meta-analysis on deception cues showed that the amount of details within a statement is one of the few reliable cues to deception (DePaulo et al., 2003). Statement inconsistency, however, may not be a reliable cue across all situations, because liars may prepare and repeat rehearsed information during interviews, whereas truth-tellers recall and reconstruct information from memory (repeat versus reconstruct hypothesis; Granhag & Strömwall, 1999, 2002). Hence, liars' statements may be as consistent as truth-tellers' statements (Sakrisvold, Granhag, & Mac Giolla, 2017; Vrij et al., 2009).

In line with these findings and as predicted, officers tended to rate statement-evidence inconsistency as the most useful inconsistency type to detecting deception. According to their reports, any form of decision making is best substantiated by evidence. The concrete nature of evidence makes it easier and less time consuming to look for this type of inconsistency compared to other types. This replicates previous findings that investigative practitioners rely heavily on evidence and facts and thus on statement-evidence inconsistency (Granhag et al., 2005; Greuel, 1992; Park, Levine, McCornack, Morrison, & Ferrara, 2002). Nonetheless, physical evidence is not always available; rather, evidence is more likely to be available in the form of eyewitness testimony which is highly susceptible to inaccuracies or misjudgments (Scheck, Neufeld, & Dwyer, 2000; Williamson, Milne, & Savage, 2009). Also, even when physical evidence exists, it is evaluated in line with one's preconceptions and expectations (Charman, Kavetski, Mueller, 2017; Dror et al., 2011; Evans, Meissner, Brandon, Russano, & Kleinman, 2010; Kassin, 2015; Vrij, Meissner, et al., 2017). Hence, officers may need to look for more than one type of inconsistency to detect deception.

Similar to previous research findings with laypeople (Strömwall et al., 2003), officers reported looking for within-group inconsistency when multiple suspects are involved in a case. However, not all officers agreed that within-group inconsistency is a reliable cue to deception. Some found it difficult to assess, because deceptive group members may rehearse together prior to the interview, have different motivations, or recall information differently. Nonetheless, with the implementation of strategic (Granhag et al., 2013) or unanticipated questioning techniques (Sooniste, Granhag, Strömwall, & Vrij, 2016; Vrij et al., 2009), within-group inconsistency may be elicited in liars more than in truth-tellers.

Officers did not differ in their reliance on between-statement inconsistency and within-statement inconsistency, because they believed these to be the least useful inconsistency types. Time lapse between statements and memory factors were thought to jeopardize the meaningfulness of between-statement inconsistency. In addition, officers had divided views on whether liars or truth-tellers are more inconsistent across statements. The difficulty of assessing this type of inconsistency may be attributed to liars' attempts at thoroughly rehearsing and thus repeating statements consistently across interviews (Granhag & Strömwall, 2002; Harvey et al., 2017).

Within-Statement inconsistency was thought to be the least useful type of inconsistency, because liars attempt to eliminate this type of inconsistency more than any other type. This is in line with our predictions and with previous research showing that liars attempt to eliminate within-statement inconsistency to a greater extent than between-statement inconsistency, within-group inconsistency, and statement-evidence inconsistency (Deeb et al., 2017; Granhag et al., 2013; Tekin et al., 2016).

However, officers believed that when evidence is presented strategically and after all possible explanations for it have been exhausted, liars are likely to change their statement and fit it with the evidence. Although liars may eventually change their statement to be consistent with the evidence, they do not necessarily do this instantly (Granhag, Vrij, et al., 2015; Luke, Dawson, Hartwig, & Granhag, 2014). Research on the Strategic Use of Evidence technique has found that liars rarely changed their statement, and statement-evidence inconsistency was found to be a relatively more valid indicator than within-statement inconsistency in distinguishing liars and truth-tellers (Granhag, Rangmar, et al., 2015). These findings may be explained by liars' counter-interrogation strategies as liars often use a withholding strategy (Granhag & Hartwig,

2008). Only when they estimate they can no longer maintain their statement do liars start giving more information or changing their statement (Granhag, Vrij, et al., 2015). Nonetheless, in line with officers' beliefs, wherever a form of within-statement inconsistency exists, the suspect is more likely to be deceptive than truthful (Granhag et al., 2013; Tekin et al., 2016).

It is important to point out that older police officers were less likely to believe that liars would avoid within-statement inconsistency more than other inconsistency types. A closer look at the open-ended responses demonstrated that older officers were very reliant on evidence. This suggests that older officers are unlikely to use contradictions and inconsistency types if evidence is not present; instead, they look at the context, similar to experienced officers. Given that age and experience were correlated, it may not be surprising that senior and experienced officers are more likely to look at the context in making veracity judgments than their younger and less experienced counterparts.

Based on the overall findings, it is recommended that investigative practitioners look at inconsistency types simultaneously when possible. For example, in cases involving multiple suspects, it may not be enough to look at evidence. It might be necessary to compare suspects' statements to understand if they are covering up for somebody or if they are minimizing their role in the crime. Accordingly, and as Granhag et al. (2013) pointed out: "We want to warn against putting one measure [statement-evidence inconsistency] against the other [within-statement inconsistency].... Our message is that both cues should be acknowledged and used, and that they may work in tandem to catch lying suspects." (p. 11).

It may be wise to simultaneously inspect different types of inconsistency in suspects' statements while at the same time actively using the interview protocol to elicit inconsistency in liars' statements (Vredeveldt et al., 2014). Police officers' responses to the open-ended questions



revealed that 34% of the officers mentioned they played an active role in the interview by, for example, asking suspects for reverse order narrations of events to increase cognitive load or posing more in-depth questions. This rate may be even higher in real-life interviews, because (a) the question was open-ended and perhaps some officers missed mentioning interview manipulations they employ, and (b) the UK, Australia, and Canada are increasingly implementing information-gathering approaches to investigative interviewing and hence, officers are more likely to use evidence-based and ethical tactics during interviews (Alison, 2005; Walsh, Oxburgh, Redlich, & Myklebust, 2015). Although Canada is known for officially implementing the Reid Technique—an accusatory approach to interviewing that is not empirically supported (Kassin, 2015; Vrij, Mann, & Fisher, 2006a, 2006b), Canadian police departments seem to be moving towards the use of information-gathering techniques (Quan, 2015; Royal Canadian Mounted Police, 2016; Williamson et al., 2009). The Canadian officers who were approached communicated that they use evidence-based techniques during interviews, including unanticipated questions and the Strategic Use of Evidence technique.

### **Police Officers' Use of Drawings to Assess Inconsistency**

More than half of the officers reported having used drawings during interviews to detect deception, and the majority compared the drawings with the suspect's verbal statement(s) and less so with evidence. It may be that when officers have access to evidence, they compare the suspect's verbal statement with evidence to assess inconsistency. However, when evidence is not available, drawings may be a valuable tool to assess inconsistency (Roos af Hjelmsäter, Öhman, Granhag, & Vrij, 2014; Vrij et al., 2009).

In addition, officers thought drawings are a valuable tool to verify suspects' veracity, because liars are more likely to refuse to provide or to complete a drawing. This is in line with

previous studies demonstrating that drawings are unexpected by suspects, and liars tend to provide less detailed, plausible and consistent drawings than truth-tellers (Leins et al., 2012; Vrij, Leal, et al., 2017; Vrij, Mann, et al., 2012). Accordingly, drawings are considered an important tool during interviews, even among novice officers (Dando et al., 2009). Officers are advised to assess the extent to which suspects are familiar with the alibi setting. Liars who are familiar with the alibi setting may be able to produce statements that are as consistent as those of truth-tellers (Blandón-Gitlin et al., 2005; Deeb et al., 2018; Warmelink, Vrij, Mann, Leal, & Poletiek, 2013).

### **Police Officers' Reports of Possible Influential Factors**

We explored possible factors that officers believed to influence suspects' statement inconsistency. The most frequently reported influential factor was criminal history. Officers indicated that previous experience in interviewing would reduce suspect inconsistency. This is in line with previous research with inmates who reported that they attempt to eliminate inconsistency during interviews to appear truthful (Granhag et al., 2004, 2009; Strömwall & Willén, 2011). Also, the majority of officers mentioned intelligence and personality as influential factors. Similarly, deception research has demonstrated that manipulative, Machiavellian, and psychopathic personalities are generally more willing and better at deceiving others compared to more conscientious personalities (Cherulnik, Way, Ames, & Hutto, 1981; Kashy & DePaulo, 1996; Vrij, 2008).

Approximately half of the police officers thought that age, education level, and language proficiency are influential factors. Officers believed that young, old, and non-native suspects are likely to be inconsistent. However, research has shown that children as young as three years are good at lying (Ceci & DeSimone Leichtman, 1992), and deceptive children and adolescents are as consistent as their truthful counterparts (Roos af Hjelmsäter et al., 2014; Strömwall &

Granhag, 2005). Moreover, a study with non-native speakers revealed that truth-telling and deceptive suspects speaking in a second language were equally consistent in their statements as a result of the cognitive load imposed by the second language (Ewens et al., 2015). These results implicate that age and language proficiency do not necessarily facilitate lie detection. Hence, officers are cautioned against making erroneous judgments based on inconsistency cues. This is critical, because investigative practitioners are often confident in their veracity judgments—whether with children or with adults—although they can detect lies at chance levels only (Bond & DePaulo, 2006; Eyal, 2003; Gongola et al., 2017; Vrij, Mann, Robbins, & Robinson, 2006). To remedy such misconceptions, it is necessary for officers to receive evidence-based training in detecting lies in different populations. Training may involve cognitive approaches to interviewing such as asking children to maintain eye contact (Lawrence et al., 2017) or asking non-native speakers to report an event in reverse order in the presence of an interpreter (Ewens et al., 2015). These techniques have been shown to facilitate lie detection by reducing the number of details and reminiscences in liars' statements more than in truth-tellers' statements.

Officers also thought that police interviewing style has an effect on statement inconsistency. It has been empirically demonstrated that officers sometimes hold biases which they need to keep aside and use instead an information-gathering approach by asking open-ended questions that are formulated in accordance with the suspect's comprehension level (Goodman-Delahunty, Martschuk, & Dhami, 2014; Kassin, 2015; Vrij, Granhag, et al., 2010; Vrij et al., 2006a). Fortunately, officers were aware of these problematic issues and some reiterated them throughout their responses. Finally, officers believed that suspects' vulnerability, social class, nationality, race, and gender do not influence statement inconsistency. To our knowledge, the effects of these variables on inconsistency have not been previously examined, and field studies

with suspects may be particularly helpful in understanding their effects on statement inconsistency.

### **Methodological Considerations**

Questionnaires are self-report tools that have been criticized for not mirroring accurate cognitive processes (Fischhoff, 1975; Nisbett & Wilson, 1977). Stated differently, individuals do not necessarily have access to their higher order cognitive processes and hence may not accurately reflect on them. One way this could have been overcome in the questionnaire would be by asking officers to indicate the extent to which they use inconsistency types across different scenarios. However, the use of scenarios would limit the generalizability of the study results to similar scenarios only. Hence, the questions were kept broad to understand how officers use inconsistency types in general. Moreover, the findings concur with previous studies investigating police officers' perceptions of statement inconsistency in other countries (Alison, 2005; Greuel, 1992; Strömwall & Granhag, 2003; Tekin et al., 2017) as well as with experimental studies examining statement inconsistency (Granhag, Rangmar, et al., 2015; Mac Giolla & Granhag, 2015), which support the validity of police officers' reports in this study.

### **Conclusions**

Our findings replicate and expand previous research on police officers' perceptions of statement inconsistency. Officers seem to use the consistency heuristic and to rely heavily on contradictions and statement-evidence inconsistency to detect deception. Given that (a) inconsistency is not diagnostic of either deception or truth, (b) liars employ withholding strategies to eliminate within-statement inconsistency and to reduce contradictions in their statements, and (c) physical evidence rarely exists in actual cases, it is important for officers to rethink their views. Nonetheless, it was interesting to find that officers employing an

information-gathering approach to interviewing hold empirically supported views regarding suspects' behaviors, and are able to reflect on suspects' memory processes (reminiscences) and on suspects' attempts at eliminating within-statement inconsistency. These reflections are critical to understanding liars' and truth-tellers' metacognitive processes and eventually to enhancing deception detection.

Officers seem to be using inconsistency types and measures individually. Nonetheless, they are advised to evaluate these types and measures simultaneously to make more informed decisions about suspects' deception and guilt. They also need to take the interview context and protocol into account; otherwise, the tendency to rely on (in)consistency may in some cases lead to mistaken judgements about the suspect's guilt or innocence. Hence, even where evidence exists, officers need to consider multiple (in)consistency cues and search the context for explanations of these (in)consistencies.

Officers who held evidence-based views (particularly older officers) were likely to consider the context when making legal decisions. It is important that younger officers keep an open mind and not narrowly focus on presumptions they may hold about deceptive behavior. These gaps in officers' knowledge and focus may be remedied by further supervision from senior officers as well as by more collaborations with and training by investigative interviewing and lie detection scholars.

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Table 1  
*Means and Standard Deviations for Responses to Closed Questions*

Closed Questions	<i>M</i>	<i>SD</i>
1. To what extent do you believe the following are indicative of deceit or honesty <sup>a</sup>		
Contradictions	2.77	1.47
Repetitions	4.24	0.89
Reminiscences	3.77	0.80
Omissions	3.42	0.92
2. In deciding whether the suspect is lying or telling the truth, how often do you look for <sup>b</sup>		
Contradictions	6.00	0.86
Repetitions	4.75	1.46
Reminiscences	5.04	1.28
Omissions	4.80	1.26
3. If you have available two statements provided by a single suspect across two interviews, to what extent do you rely on <sup>b</sup>		
Within-Statement inconsistency	5.10	1.03
Between-Statement inconsistency	5.04	1.14
4. In a case with multiple suspects, each suspect interviewed more than once, and critical evidence available, to what extent would you look for <sup>b</sup>		
Within-Statement inconsistency	5.10	1.12
Between-Statement inconsistency	5.26	1.06
Statement-Evidence inconsistency	6.00	0.94
Within-Group inconsistency	5.46	1.06
5. In general, to what extent do you find it difficult to assess <sup>c</sup>		
Within-Statement inconsistency	3.48	1.22
Between-Statement inconsistency	3.27	1.06
Statement-Evidence inconsistency	2.61	1.24
Within-Group inconsistency	3.45	1.26
6. Imagine that you questioned a suspect exhaustively, but their statement still did not match a critical piece of evidence. When you now confront the suspect with that evidence, do you believe liars are more likely to eliminate <sup>b</sup>		
Within-Statement inconsistency	4.31	1.04
Statement-Evidence inconsistency	4.92	1.01
7a. To what extent do you think liars find it important to eliminate <sup>b</sup>		
Within-Statement inconsistency	5.34	1.00
Between-Statement inconsistency	4.99	1.11
Statement-Evidence inconsistency	4.90	1.19
Within-Group inconsistency	4.76	1.30
7b. To what extent do you think truth-tellers find it important to eliminate <sup>b</sup>		
Within-Statement inconsistency	5.55	1.38
Between-Statement inconsistency	5.46	1.38
Statement-Evidence inconsistency	5.41	1.48
Within-Group inconsistency	5.23	1.57

<sup>a</sup> 7-point scale (1 = *strongly indicative of deceit* and 7 = *strongly indicative of honesty*).

<sup>b</sup> 7-point scale (1 = *never* and 7 = *always*). <sup>c</sup> 7-point scale (1 = *extremely easy* and 7 = *extremely difficult*).

Table 2

*Categories and Corresponding Percentages for Responses to Open-Ended Questions*

Open-Ended Questions	Frequency
1. In general, what type(s) of verbal cues are in your opinion the most important to decide whether the suspect is lying or telling the truth?	
Amount of detail	62%
Statement inconsistency	46%
Refusal to answer/ avoiding question	39%
Fillers (e.g., honestly, um, like)	14%
Other cues	45%
2. Please describe how you would determine whether the suspect's statement is inconsistent when you have available a single statement from one suspect [ <i>within-statement inconsistency</i> ].	
Different cues such as details and plausibility	34%
Interview manipulation	34%
Contradictions	32%
Comparison of suspect statement with the evidence	31%
Confrontation of the suspect with the evidence after exhausting alternative explanations	27%
Other	10%
3. Please explain how you used inconsistency in drawings to determine whether the suspect was lying or not.	
Correspondence between drawing and verbal statement	44%
Correspondence between drawing and evidence	33%
Improbable positioning of items within the drawing	14%
Unwillingness/Inability of the suspect to draw or complete the drawing	11%
Other	14%
4. Please insert any comments you might have about why you think (any of) the characteristics might or might not influence a suspect's credibility?	
Language proficiency (Suspects who are non-native speakers)	33%
Criminal history (Suspect's experience with interviewing)	30%
Many factors combined to influence inconsistency	20%
Age (Young or elderly suspects more inconsistent than adults)	18%
Intelligence (Reduces inconsistency)	15%
Personality traits (Narcissism, anxiousness)	13%
Officer interviewing style	13%
Suspect vulnerability	10%
Officer confirmation bias	10%
Type of offence	5%
Time factors influence inconsistency	5%
Other	23%