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**The Cognitive Interview for Suspects:
A Test with Customs Officers**

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Abstract

The current study aimed to test the impact of the Cognitive Interview for Suspects (CIS) used by trained custom officers on the quantity of gathered details, compared to a control Standard Interview (SI) used by untrained officers. Forty-five mock-suspects were required to perform a series of actions and each was interviewed by a pair of customs officers. Participants had to give statements containing truthful parts and deceptive parts. The CIS elicited significantly more details than the SI. Truthful parts of the statements contained more details than deceptive parts. An interaction effect revealed that the CIS elicited a higher number of action details in truthful parts. It is worthwhile for professionals in the field to adopt the CIS, which provides valuable benefits for information gathering. Moreover, the increase in action details raise the question of considering it as a possible lie detection tool.

Keywords: Cognitive Interview for Suspects – Customs – Information gathering – Lie detection – Standard Interview – Training

52 Investigators may have various objectives when interviewing a suspect: to obtain as
53 much details as possible, to distinguish between lies and truth, and to obtain a confession.
54 Interrogation models considered as accusatory, such as the Reid technique, tend to emphasize
55 only one of these goals, namely obtaining a confession (Inbau et al., 2001). This may also be
56 the case for standard interviews, i.e. interviews conducted by untrained interviewers (Snook et
57 al., 2012). Typically, these interview models are constructed on the basis of a short
58 questions/short answers interaction (Kebbel et al., 2001) and can contain 'psychologically
59 manipulative tactics that are designed to elicit compliance from a suspect in the form of a
60 confession to the crime' (Meissner et al., 2014: 462). This quest for a confession often limits
61 the volume of details obtained due to its narrow focus (Gudjonsson, 2003). However, the
62 quantity of gathered details is crucial for case solution and effective criminal prosecution
63 since, on the one hand, it makes it possible to obtain valuable information on a criminal event
64 and, on the other, permits the emergence of inconsistencies that result in the detection of lies
65 (Dando & Bull, 2011; Geiselman & Fisher, 2014).

66 By contrast with the accusatory models, the Cognitive Interview for Suspects (CIS,
67 Geiselman, 2012) is a more recent interview method, inspired by 'witness interview
68 dynamics', that focuses on gathering information and identifying deception. However, to our
69 knowledge, very few studies have been conducted on the CIS, and none when it is used by
70 professionals and compared to a standard interview. Furthermore, none have assessed its
71 benefit in gathering more details. Considering the potential value of this method, the current
72 study aims to test the efficacy of the CIS compared to a standard interview (SI) conducted by
73 customs officers and to evaluate its benefits in gathering a significant amount of information
74 about the criminal event.

75

76 **The Cognitive Interview for Suspects**

77 The CIS is an adaptation of the Cognitive Interview (CI, Fisher & Geiselman, 1992),
78 which was initially developed for interviewing witnesses and victims. The core elements of
79 the CI draw on theoretical principles such as Tulving's theory of multiple access to memory
80 and specific encoding (Tulving, 1983). As proposed in Deslauriers-Varin, Bennell, and
81 Bergeron (2018), the theoretical bases are grounded in three basic psychological processes,
82 namely: memory and cognition, social dynamics, and communication. More specifically,
83 memory-enhancing techniques (e.g., Mental context reinstatement, Reverse order) are often
84 combined with methods for improving social dynamics (e.g. Rapport building, encouraging
85 active participation) in order to develop a communication environment that is most likely to
86 allow victims and/or witnesses to provide the most detailed, comprehensible, and accurate
87 account of what they experienced (Fisher & Geiselman, 1992). To date, the CI is the interview
88 technique that has undergone the most scientific testing (Geiselman & Fisher, 2014). Many
89 studies have shown that, significantly, the CI elicits between 25%-50% more correct
90 information from witnesses or victims than the comparison interview, including details related
91 to actions, people, objects, and locations, and does so at a comparable accuracy rate (Memon
92 et al., 2010). The CI or its components are now part of many police training programs and are
93 the recommended police practices in numerous countries (Deslauriers-Varin, Bennell, &
94 Bergeron, 2018).

95 In a way similar to the CI, the CIS is an information-gathering approach based on
96 scientifically derived principles of memory and communication theory. In the CIS, the suspect
97 is encouraged to provide a large amount of details that may be relevant for a police
98 investigation. As presented by Geiselman (2012), the CIS consists of eight stages: (1) *Rapport*
99 *building / Introduction*. During this stage, the interviewer develops a rapport with the suspect
100 while talking about neutral topics in order to put them in a psychologically comfortable state
101 and thus make the interview more productive; (2) *Narrative*. The suspect is encouraged to

102 freely report as many details as possible (*Report everything* instruction) and to mentally
103 recreate the context of the crime (*Mental context reinstatement* instruction); (3) *Drawing /*
104 *sketch*. In this stage, the suspect has to sketch/draw the crime scene or a part of this scene; (4)
105 *Follow-up, open-ended questions*. Questions are asked using an information-gathering
106 approach rather than a confrontational one; (5) *Reverse order* mnemonic. The suspect is
107 instructed to recall the criminal event backward; (6) *Challenge*. In this stage, the suspect is
108 gradually confronted with evidence and incriminating contradictions. The interviewer remains
109 respectful and presents the weakest evidence first; (7) *Review*. The interviewer reviews the
110 suspect's statements and asks them to correct any errors or omissions; (8) *Closure*. At this
111 stage, cooperative suspects can be thanked. To those who appear to have lied, the interviewer
112 may 'express disappointment and disrespect' (Geiselman, 2012: 5).

113 Note that six of these stages are adapted from the CI method for witnesses, whereas the
114 *Drawing* and the *Challenge* stages are two new techniques that are intended to improve lie
115 detection (Dando & Bull, 2011; Vrij et al., 2010a). Indeed, one of the major differences
116 between witness and suspect interviews is the truthfulness of the statements. Witnesses are
117 assumed to produce 'honest' errors (e.g. caused by misperception, interferences, retrieval
118 failures) while suspects tend to lie intentionally (Yarmey, 2009). These differences have led to
119 the protocol being adapted to a potentially less cooperative and more deceptive population. In
120 particular, the protocol includes some components whose purpose is to detect deception (i.e.
121 *Drawing, Reverse-order* and *Challenge*).

122 **Empirical assessment of the CIS protocol and deception detection**

123 In the first study conducted by Geiselman (2012), CIS-trained college students
124 conducted interviews with participants who had been instructed to describe a recent
125 autobiographical or a completely fabricated event. The interviewers had to rate the likelihood
126 of the participant's truthfulness at each stage of the protocol. The results from this study

127 showed that the interviewers were able to discriminate truth from lies in the CIS context and
128 that their accuracy increased as they progressed through the various stages of the protocol.
129 Two other studies have assessed the ability to discriminate between truth and lies in the CIS
130 protocol (Frosina et al., 2018; Logue et al., 2015). In these studies, the participants in the
131 truthful condition had to play a game with a confederate, whereas those in the deceptive
132 condition had to steal \$10 from a confederate's wallet, while pretending that they had also
133 played the game. They were then interviewed by CIS-trained college students. Deception was
134 rated by means of two methods: verbal cues (Logue et al., 2015) and physiological cues
135 (Frosina et al., 2018). The results showed that these lie detection methods were effective and
136 applicable in the CIS context. According to the authors, the CIS may lead to better deception
137 detection due to the information-gathering style of this protocol and to the increase in the
138 suspects' cognitive load. However, in all three studies cited, the CIS was not compared with a
139 control group. Furthermore, only deception detection was evaluated and the amount of
140 information contained in the suspects' statements was not assessed. However, it is important
141 to verify that the CIS can provide valuable details for investigative purposes, while at the
142 same time increasing the number of opportunities for signs of deception to emerge. Finally,
143 given the applied aim of the CIS, it seems particularly important to assess whether it can be
144 beneficial in the field when used by professionals who regularly interview suspects.

145 **Hypotheses**

146 In the current study, the investigators were customs officers. Indeed, this is a population
147 that has been insufficiently studied in the scientific literature compared to police officers, even
148 though interviewing suspects is also one of a customs officer's tasks (Granhag et al., 2014).

149 Trained or untrained customs officers had to gather details in a mock-suspect interview.
150 The experimental design involved mock-suspects in order to verify the accuracy of the
151 gathered information, which is an important element to be taken into account in the field. In

152 order to mimic a real-life situation, the participants were asked to lie about some parts of their
153 actions and to tell the truth about others (Vrij et al., 2010b). More specifically, it was expected
154 that, compared to a SI, the CIS would help the interviewers gather more details (i.e. more
155 action, person, object and location details) without increasing the number of incorrect and
156 confabulated details. Moreover, as was found in Geiselman (2012), the CIS-trained
157 interviewers were expected to detect lies better than untrained ones.

158

159

Method

160 Participants and Design

161 *Interviewees*

162 Our initial sample was composed of 48 French undergraduate students (14 men and 34
163 women). However, three participants were excluded because of recording failures during the
164 interview process. The final sample consisted of 45 participants (13 men and 32 women). An
165 a priori power analysis established with the Superpower package in R (Lakens & Caldwell,
166 2021) for within-between interactions on ANOVAs had indicated a necessary sample size of
167 70 participants to allow an effect size of $f = 0.16$ (estimated from Vrij et al. (2015) study),
168 with $\alpha = .05$ and a 87% power. However, the size of the sample was determined by the
169 constraints of the customs service and the number of investigators available .The participants
170 were aged between 18 and 38 with a mean age of 19.93 ($SD = 3.73$) and all used French as
171 their first language. All the participants received course credits and a €10 reward for their
172 participation. They were randomly assigned within a 2 (interview: CIS vs. SI) x 2 (veracity:
173 lie, truth) mixed design, with veracity as a within-subject variable.

174 *Confederates*

175 Two female research assistants (aged 21 and 38 years) acted as confederates. One of
176 them acted as an experimenter, spending most of the time during the experiment with the

177 participant, while the other acted as a laboratory member, who was met only briefly during
178 the ‘criminal’ stage of the experiment. Each experimenter learned the two roles, which were
179 pre-determined, and played them in equal proportions.

180 *Interviewers*

181 This study was conducted in collaboration with a French customs service, which is a
182 service that investigates fraud and trafficking offences and realises suspects interviews. The
183 interviewers were 12 French volunteer customs officers: 3 women and 9 men, whose ages
184 ranged from 30 to 61 years ($M = 48.56$, $SD = 8.38$), and who used French as their first
185 language. They were recruited on a voluntary basis after a collaborative training project
186 presented by their department head, who wanted some officers to be trained in interview
187 methods. The officers had all been trained in customs missions at the National Customs
188 School. However, this did not include training in interview methods. Their seniority within
189 the customs service ranged from 6 to 40 years, with an average of 23.33 years of experience
190 ($SD = 8.75$).

191 **Training**

192 *Cognitive Interview for Suspects*

193 Six interviewers received CIS training and the six remaining interviewers had no
194 interview training (the experimenter asked them to conduct the interview as they usually did.
195 It should be noted that they received the CIS training three months after the experiment was
196 over.). The latter group was used as a control group for the current study. The distribution of
197 interviewers to training conditions was random.

198 The training lasted 10 hours and was given by the first author of this paper at the
199 university. Three weeks before the training, the interviewers received an academic booklet
200 including theoretical information on the CIS (e.g. advantages of rapport building, questioning
201 styles, CIS mnemonics), a quiz, documents and exercises. They were asked to read and

202 complete the booklet before the intervention took place. The training included exercises,
203 formal presentation, and role-playing games followed by detailed feedback. In order to avoid
204 biasing the results of the study, the trained interviewers were asked not to talk about the CIS
205 method to the untrained interviewers until after the end of the experiment.

206 To assess their self-reported interviewing ability, the CIS-trained interviewers had to
207 answer the question: ‘On a 1 to 5 scale, with 1= *not at all* and 5= *absolutely*, how experienced
208 do you feel in interviewing suspects?’ before and after the training. A Paired-sample *t*-test
209 showed that the interviewers trained in the CIS reported being more skilled in interviewing
210 after the training ($M = 3.38$, $SD = 0.52$, 95% CI [2.94, 3.81]) than before it ($M = 2.63$, $SD =$
211 0.74 , 95% CI [2.00, 3.25]), $t(5) = -4.58$, $p = .003$, $d = 3.46$.

212 In order to verify that the interviewers had actually used the components/strategies
213 learned during training, they were coded based on the audio recordings of the interviews. This
214 coding revealed that the trained interviewers were fairly accurate in following the taught
215 protocol (see supplemental online material for more information). Such an observation was also
216 made in the SI. Although SI are ‘instinctive’ interviews conducted by untrained interviewers,
217 and therefore normally all different, there were similarities between these practices. In general,
218 the SI did not include a rapport building, and the interviewers asked many closed, leading, and
219 repeated questions. In addition, they directly accused the interviewees and regularly cut them
220 off.

221 ***Lie detection***

222 In order to limit motivational effects due to the CIS training, all the interviewers
223 received lie detection training prior to the current study. Moreover, because the study aimed to
224 test the potential benefit of CIS in improving lie detection among interviewers, it was

225 necessary to ensure that the investigators had a minimum shared level of knowledge in this
226 area.

227 The training lasted 4 hours and was given by the first author of this paper on the
228 university premises. Three weeks before the training, the interviewers received an academic
229 booklet including theoretical information on deception detection (e.g. ‘pitfalls and
230 opportunities’ presented in the scientific literature; Vrij et al., 2008), a quiz, documents and
231 exercises. They were asked to read and complete the booklet before the intervention took
232 place. The training included exercises and role-playing games followed by detailed feedback.

233 **Procedure**

234 It should be noted that for the purposes of the following procedure, the motivational
235 incitement of the participants to lie, the interview length, the contextual background given to
236 the interviewer, and the lie detection assessment were inspired by the study conducted by Vrij
237 et al. (2015), which aimed to compare a trained and an untrained group of interviewers. Their
238 procedure was then adapted to the context of our study.

239 ***Interviewees***

240 The participants were recruited on a voluntary basis by asking them to enter their
241 names on a list posted in the laboratory. After arriving at the university, the interviewees
242 completed an informed consent form and were then told that they would perform a series of
243 actions, and then help us to analyse customs interviewers’ lie detection abilities by lying them
244 about some of these actions.

245 This series of actions constituted a complete scenario consisting of four sequences
246 lasting about 8 minutes each. The complete scenario lasted about 32 minutes, and the
247 participants had to tell the interviewers the whole scenario after having lived it.

248 Because we wanted participants of our study to mimic real-life suspects who may lie
249 about some aspects of the to-be-remembered event and tell the truth about other aspects, each
250 participant was instructed to tell the interviewers the truth about two of the four sequences
251 they experienced and to lie about the other two sequences.

252 So that it is not always the same sequences, for all the participants, which are the
253 object of a lie or of the truth, we carried out a counterbalancing. To do this, we created a true
254 version and a deceptive version of each sequence (see table 1). We then created four possible
255 combinations of truthful and deceptive sequences, corresponding to four possible scenario
256 versions (see Table 2).

257

258 INSERT TABLE 1 ABOUT HERE

259

260 INSERT TABLE 2 ABOUT HERE

261

262 For example, a participant who lived scenario C had to go with a confederate to pick
263 up a document in an unknown room of the university, then sat in a corridor and completed a
264 logic questionnaire, then read a text describing the truthful car park sequence and had to
265 imagine s/he performed it so s/he can convince the interviewer that s/he really did so, and
266 finally met a confederate to exchange an envelope with cash, but s/he was asked to pretend
267 that s/he completed the quiz and convince the interviewer.

268 The interviewees were equipped with video-recording spy glasses during all the
269 sequences so that the experimenters could check the veracity of their interview statements.
270 The glasses were worn on the nose of the participants, and recorded what they saw with an

271 angle of 180°. Thus, it was possible to observe their movements through the different
272 buildings, and also the objects and people they met. Moreover, the glasses also recorded the
273 sound, allowing to hear the various noises and conversations to which they were exposed.

274 After the first part of the experiment, the participants were told that the purpose of the
275 study was to assess the ability of customs officers to detect lies. The participants were thus
276 informed that, to this end, they would be interviewed about the event and have to lie about its
277 ‘lie sequences’ and tell the truth about the ‘truth sequences’. In order to enhance motivation
278 during the interviews, they were also told that it was important to convince the officers that
279 they were telling the truth, and that they would receive a €10 reward if they were successful in
280 doing so. Moreover, they were told that if the interviewers were not convinced, they would
281 have to send an e-mail dissertation on their lying skills. The aim of this methodological choice
282 was to mimic the real-life situation of a suspect as much as possible (i.e. more motivated to lie
283 than to tell the truth about their wrongdoing because of the potential consequences they may
284 face).

285 The interviewees were taken to the interrogation room and interviewed. They were
286 then debriefed and they all received a €10 reward for their participation.

287 ***Interviewers***

288 After arriving at the university, pairs of customs officers (both trained or both
289 untrained to CIS) were assigned to an interrogation room in the same way as when they are
290 used to conducting interviews in the field. They were told that a mock-crime had been
291 committed in the university (i.e. that a transcript had been stolen from a teacher’s office and
292 sold for money) and that they had to find out what happened by interviewing students. Each
293 customs officer in each pair of interviewers had to interview four participants. In these four
294 interviews, only the interviewer talked with the interviewee, while the other officer just

295 listened. They were asked to interview the mock-perpetrator for a maximum of 45 minutes in
296 the light of the length of the scenario experienced by the participants. The actual average
297 length of the interviews was finally 24 minutes and 36 seconds ($SD = 7.14$). In the SI
298 condition, the interviews were longer ($M = 27.97$; $SD = 6.27$; 95% CI [25.12, 30.82]) than in
299 the CIS condition ($M = 21.69$; $SD = 3.58$, 95% CI [20.19, 23.21]), $t(44) = 4.04$, $p < .001$, $d =$
300 1.28.

301 The interviewers and interviewees gave their prior consent for the interviews to be
302 audio-recorded. The officers were not aware of which scenario had been played out by the
303 mock-suspects. The interviewers were given the contextual background to the events (cf.
304 Appendix A) to enable them to organize their interview as they would do in a real case. When
305 the interview was over, the officers had to assess whether the interviewee was lying or telling
306 the truth for each of the four sequences. The pair of investigators deliberated together before
307 giving a common judgment for each sequence, in a dichotomous manner (e.g. this sequence
308 about the car park is truthful or is deceptive). The number of errors was counted for each of the
309 four participants interviewed by the same interviewer (min.: 0, max.: 16). More precisely, two
310 types of errors were possible: ‘truth’ errors (thinking that the sequence is deceptive when it is
311 actually truthful) and ‘deception’ errors (thinking that the sequence is truthful when it is actually
312 deceptive). Moreover, the correct answers were counted in the same way: the ‘truth’ correct
313 answers (thinking that the sequence is truthful when it is in reality truthful) and the ‘deception’
314 correct answers (thinking that the sequence is deceptive when it is in reality deceptive).

315 **Coding of the statements**

316 The interviews were audio-recorded and transcribed verbatim. All the details reported
317 by the participants were coded by the first author of the study, with one point being given for
318 each detail. They were only scored the first time they were reported (repeated details were
319 ignored). In a way that is consistent with the CI literature (Holliday et al., 2011; Stein &

320 Memon, 2006), each detail was classified into one of the following four categories: actions
321 (details describing something that the participant or another person did, e.g. ‘I walked’),
322 objects (details describing an object, e.g. ‘the logic test sheet’), locations (details describing a
323 location, e.g. ‘the third floor corridor’), and persons (details describing the participants
324 themselves or another person, e.g. ‘the small experimenter’). Video records were used to code
325 the quality of details in the truthful parts of the statements. Each detail was coded as correct
326 (i.e. describing something that corresponded exactly to what actually occurred), incorrect (i.e.
327 wrongly describing something that actually happened) or confabulated (i.e. describing
328 something that did not occur at all).

329 Twenty-three interviews (i.e. 51.11 %) were coded by a second independent coder in
330 order to assess coding reliability. A series of two-way mixed intraclass correlations (ICC)
331 revealed a high degree of reliability between the two raters for all the measures (all ICC (1,2)
332 $\geq .78$).

333 Moreover, the number of questions asked was also coded. The analyses showed that
334 three times as many questions were asked in the standard interviews, ($M = 173.52$, $SD = 55.60$,
335 95% CI [148.21, 198.83]), than in the CIS ($M = 47.63$, $SD = 24.14$, 95% CI [37.43, 57.82]),
336 $t(44) = 9.62$, $p < .001$, $d = 3.07$. The number of questions will be taken into account in order to
337 calculate the ratio of the number of recalled details to the number of questions asked.

338

339

Results

340 **Position of the participant in the interview set and influence of the scenarios**

341 Each interviewer conducted four successive interviews, each involving different
342 participants. In order to check the potential effect of the participant’s position in the series of
343 interviews depending on the type of interview used, three 2 (interview: SI vs. CIS) x 4

344 (interviewee position: 1 vs. 2 vs. 3 vs. 4) ANOVAs were conducted, with both factors as
345 between-subject variables. There was no significant effect of position on the total number of
346 details (i.e. the sum of correct, erroneous and confabulated details) and the number of correct
347 details provided, $F_s \leq 0.59$, $p_s \geq .624$. There was also no effect of the interaction between
348 interview style and interviewee position on the total number of details and the number of
349 correct details, $F_s \leq 1.59$, $p_s \geq .208$.

350 In addition, the participants experienced one of the four versions of the scenario
351 (depending on the counterbalancing). To check the effect of this variable on the main
352 measures, three 2 (interview: SI vs. CIS) x 4 (scenario counterbalancing: A vs. B vs. C vs. D)
353 ANOVAs were conducted, with both factors as between-subject variables. There was no
354 significant effect of the scenario counterbalancing on the total number of details and the
355 number of correct details, $F_s \leq 1.37$, $p_s \geq .266$. There was also no effect of the interaction
356 between interview style and scenario counterbalancing on the total number of details and the
357 number of correct details, $F_s \leq 0.70$, $p_s \geq .561$.

358 The interviewee position and scenario counterbalancing variables were therefore not
359 included in the subsequent main analyses. All results for the main effects of interview style
360 are discussed below.

361 **Total number and type of details recalled**

362 A series of 2 (interview: CIS vs. SI) x 2 (veracity: truth, lie) mixed ANOVAs with the
363 last factor as a within-subject variable were conducted on the total number and type of details
364 recalled. Descriptive statistics and analyses are presented in Table 3.

365 Overall, the analysis revealed a significant main effect of interview style, with CIS
366 eliciting more details than SI. Furthermore, there was a main effect of the interview style on
367 the number of details recalled in relation to actions, objects, and locations, with CIS eliciting

368 more such details than SI. However, no significant effect of interview style was observed on
369 the number of details recalled in relation to persons.

370 The analysis also revealed a significant main effect of veracity, with the truthful parts
371 of the statements containing more details than the deceptive parts. Furthermore, there was a
372 main effect of veracity on the action, object, and person-related details recalled, with the
373 truthful parts of the statements containing more details of these types than the deceptive parts.
374 No significant main effect of veracity was observed for location-related details.

375 No overall significant effect of the interaction between interview style and veracity
376 was found for the total number of details, $F(1, 45) = 0.52, p = .477$. However, a significant
377 interaction effect was observed for action details, $F(1, 45) = 5.87, p = .020, d = 0.74$. Truthful
378 parts of the statements contained more action details ($M = 18.92, SD = 5.15, 95\% CI [16.74,$
379 $21.09]$) than the deceptive parts ($M = 15.37, SD = 6.29, 95\% CI [12.72, 18.03]$), in the CIS-
380 gathered statements, $t(24) = 3.23, p = .002, d = 1.35$, but not in the SI-gathered statements
381 (truthful: $M = 11.02, SD = 3.67, 95\% CI [9.85, 13.19]$, deceptive: $M = 11.81, SD = 4.67, 95\%$
382 $CI [9.64, 13.98]$), $t(21) = 0.25, p = .803, d = 0.11$. There were no interaction effects between
383 interview style and veracity on the recalled object, location, or person-related details, $F_s <$
384 $0.854, p_s > .360$.

385

386 INSERT TABLE 3 ABOUT HERE

387

388 Considering the number of questions asked, the ratio of gathered details was 3.65
389 details per question for the CIS (130.71 details for an average of 47.63 questions asked), and
390 0.58 details per question for the SI (101.24 details for an average of 173.52 questions asked).

391 **Accuracy of truthful statements**

392 To compare the accuracy of the gathered statements, the effect of interview style on
393 the number of correct, erroneous and confabulated details reported in truthful parts was
394 analyzed with an independent samples *t*.test (the deceptive parts were not concerned, as they
395 were entirely inaccurate). Descriptive statistics and analyses of these results are presented in
396 Table 4.

397 There was a significant main effect of interview style on the number of correct details
398 recalled, with CIS statements containing more correct details than SI statements. Furthermore,
399 there was a main effect of interview style on the number of correctly recalled action, object,
400 and location details, with CIS significantly outperforming SI. There was no difference
401 between CIS and SI for correct person-related details.

402 Overall, there was no significant difference between CIS and SI on the number of
403 erroneous or confabulated details produced. However, there was a significant main effect of
404 interview style on the number of erroneous and confabulated person-related details produced,
405 with CIS eliciting more errors and confabulations than SI. There were no differences between
406 CIS and SI for the erroneous and confabulated details produced in relation to actions, objects
407 and locations.

408

409 INSERT TABLE 4 ABOUT HERE

410

411 The accuracy rates (correctly recalled details as a proportion of total details provided)
412 were, respectively, 93.86% vs 93.96% for CIS and SI, and were not significantly different,
413 $t(44) = 0.08, p = .935$.

414 **Interviewers' lie detection skills**

415 In total, the CIS-trained interviewers made 10 lie detection errors, whereas the
416 untrained officers made 11 errors. The interviewers' lie detection accuracy rates were
417 calculated by dividing the number of correctly identified truthful/deceitful sequences by the
418 total number of sequences in the statements. These rates were, respectively, 89.58% and
419 83.82% for CIS and SI, and did not differ significantly, $t(44) = -0.78, p = .235$.

420 Furthermore, the number of errors made by CIS-trained interviewers and SI
421 interviewers did not differ for truth errors and deception errors. It was the same for truth
422 correct judgements, $F_s \leq 0.69, p_s \geq .410$. However, analyses revealed a difference in
423 deception correct judgements: CIS-trained interviewers gave more deception correct
424 judgements ($M = 1.83, SD = 0.38, 95\% \text{ CI } [1.67, 1.99]$), compared to SI interviewers ($M =$
425 $1.47, SD = 0.80, 95\% \text{ CI } [1.06, 1.88]$), $t(44) = -1.74, p = .049, d = 0.62$.

426

427 **Discussion**

428 The aim of the study was to provide knowledge about the benefits of the CIS used by
429 field professionals, compared to officers using their own interview techniques. The broad
430 hypothesis of this study was that CIS-trained customs officers would gather more detailed
431 statements from the participants compared to the untrained officers using SI, without
432 increasing the number of erroneous and confabulated details. The results of our study support
433 this hypothesis, and are described more precisely in the sections below.

434 **Details gathering**

435 As expected, the analyses revealed that the customs officers collected more details
436 when using the CIS than the standard interview. These results provide information about the

437 advantage of the CIS for details gathering compared to a SI conducted by professional
438 interviewers. More precisely, the CIS made it possible to gather 29% more details than the SI.
439 In terms of quantity of details, the increase was high for the following categories: the actions,
440 objects, and locations (respectively 32%, 19% and 29% more with CIS). These results are
441 consistent with observations made concerning the benefit of using CI rather than SI for
442 witnesses/victims in terms of the quantity of gathered details (Colomb et al., 2013; Memon et
443 al., 2010).

444 However, we did not observe any such increase for person-related details. This result
445 has already been found in studies of CI used for witnesses/victims, and even for lying
446 witnesses. In the study by Bembibre and Higuera (2011), CI revealed fewer person-related
447 details than SI, but as many object and more action details. The authors explained that these
448 results could be due to the general context of criminal investigations, in which it seems more
449 important for interviewees to describe actions (elements that could inculpate or exonerate a
450 suspect), rather than people and their physical appearance (Bembibre & Higuera, 2011;
451 Milne & Bull, 2002). It is also possible that the absence of improvement for the person details
452 category is due to the event chosen for this study. Indeed, the participant was alone in most of
453 the scenario events: only one of the sequences involved an interaction with an unknown
454 person, and not all the participants had to meet this person. A floor effect could therefore
455 explain this lack of difference.

456 Despite this issue concerning person-related details, the overall increase for details
457 quantity is all the more noteworthy when we consider that the interview duration was shorter
458 with the CIS than with the SI. These results for interview lengths are due to the number of
459 questions asked by the interviewers across the conditions. Indeed, SI contained more than
460 three times as many questions as CIS. Considering that the CIS made it possible to obtain
461 29% additional details, the details/questions ratio (i.e. 6.29 times more details with the CIS)

462 highlights a high increase for details gathering with this interview method. These results
463 reflect prior observations from SI which have been analyzed in the literature. Indeed, SI
464 contain very few open-ended questions and many closed-ended questions, the answers to
465 which are not very informative. Interviewers therefore spend a lot of time during the interview
466 asking questions in an attempt to obtain more details, sometimes in vain (Snook et al., 2012).
467 These findings are of interest to field investigators in that the majority of professionals cite
468 time constraints as a barrier to the application of lengthy protocols, such as the Cognitive
469 Interview (Dando et al., 2008).

470 As expected, analyses of the truthful parts of the statements revealed an improvement
471 in the gathering of correct details with the CIS (23% more details), without any increase in the
472 number of errors and confabulations. More precisely, the beneficial effect of CIS was found
473 on action, object, and location details. However, and as in the analysis of the amount of
474 details, this improvement in the number of correct details was not present for person-related
475 details. In addition, the analyses revealed an increase in the number of errors and
476 confabulations affecting the descriptions of persons in CIS compared to SI, even if the volume
477 of incorrect information was globally very low (i.e. less than one item per interview). In the
478 literature, person-related details have already been found to be a category that is affected by
479 many errors. In a study by Sauerland et al. (2014), in which participants were asked to
480 produce a free recall preceded by a report-everything mnemonic, the person-related details
481 category exhibited a lower accuracy rate (71.55%) than the other event-related categories of
482 details (i.e. action, object and location details: 94.39%). Indeed, Meissner et al. (2007)
483 showed that the person-related details category was of particular interest to the interviewers
484 and that the latter tended to ask more leading and repeated questions on this subject, despite
485 their training in interview methods such as the CI. However, these observations do not explain
486 why the number of errors on person-related details is higher in CIS than in SI. Future research

487 should explore this phenomenon more closely and analyze the joint impact of the
488 interviewers' interest in this category of detail, the type of questions arising from this interest
489 and instructions such as those present in the CIS (e.g. *Mental context reinstatement*) on the
490 potential for person-related errors and confabulations.

491 In suspect interviews, it is also useful to be able to detect deception in a statement. Lie
492 detection studies generally show that truthful statements contain more details than deceptive
493 ones (e.g. Bogaard et al., 2019; Masip et al., 2005). As expected, this is the case in the present
494 study, in which the total number of details was higher in the truthful parts (20% more details)
495 than in the deceptive parts of the statements. In particular, the truthful parts contained more
496 action, object, and person-related details. However, the truthful parts did not include more
497 location details than the deceptive ones. This phenomenon may be due to a strategy adopted
498 by the participants in order to produce credible lies. Indeed, although they could not anticipate
499 the objects, actions and people they were going to meet during this experiment, the students
500 knew the university's rooms, corridors, stairs and car park (where the experiment took place).
501 Therefore, the deceptive parts could include as many location details as the truthful parts
502 because the participants could describe the places precisely, even if they had not been there
503 that day.

504 Furthermore, and with regard to the action details, an interaction effect between
505 veracity and interview style highlighted the fact that a difference between truth and lies was
506 only present for the statements gathered with the CIS (and not for the statements in response
507 to the SI). In view of the recommendation made in the study by Masip et al. (2005), according
508 to whom verbal cues to deception are particularly visible in 'information gathering style'
509 interviews, these results suggest that action details could be considered as a verbal truth/lie
510 discriminant criterion to be integrated into verbal lie detection tools such as the Reality
511 Monitoring list (see Izotovas et al., 2018).

512 Apart from the number of actions, the results did not indicate any other effect of an
513 Interview Style x Veracity interaction on the details gathered. This means that the observed
514 increase in the quantity of details obtained with the CIS (compared to the SI) also concerned
515 the deceptive statements. This is potentially problematic from the perspective of interviewers,
516 who may be misled by more detailed lies. Indeed, there are many misleading beliefs about
517 lying (Bond & DePaulo, 2006). Although the quantity of information is a criterion of the
518 CBCA list, which allowed for some accuracy in discriminating lying and truthfulness (Vrij,
519 2005), more recent studies have shown that a strategy sometimes used by liars is to mix lying
520 and truthfulness in their statements, which tends to result in more detailed lying parts (Verigin
521 et al., 2019). Thus, interviewers should be informed that a testimony gathered using the CIS is
522 likely to be more detailed, even when it is untrue.

523 **Deception detection**

524 We expected that the CIS-trained interviewers would be better lie-detectors than the
525 untrained ones, given that Geiselman (2012) has already stated that the interview method
526 would facilitate lie detection. The results did not show a significant difference in the number
527 of errors made in lie detection as a function of the type of interview. This could be due to the
528 fact that there were only very few lie detection errors: ten errors for the CIS trained officers
529 and eleven errors for the untrained ones, corresponding to accuracy rates of 89.58% and
530 83.82%, respectively. These are among the highest accuracy rates to have been found in
531 deception detection studies and they may be related to the repetition of interviews regarding
532 the same events and to the material evidence provided. Firstly, each pair of customs officers
533 had to interview eight participants, and the officers were therefore able to construct an idea of
534 the four scenarios acted out by the interviewees. This does not reflect the procedure in real
535 cases. Secondly, items of material evidence were given to the interviewers in the study, as in
536 Vrij et al. (2015). For example, two pictures - one of the room and one of the car - were given

537 to the interviewers, thus making it possible for them to know when the interviewees were
538 lying about these two aspects. In further studies, less critical evidence, or no evidence at all,
539 should be given to the interviewers in order to make it possible to analyze their real deception
540 detection abilities.

541 However, considering the type of detection judgments, results showed a benefit of CIS
542 in identifying deception. More precisely, CIS-trained interviewers made more correct
543 deception judgments than SI interviewers, which could be interpreted as CIS more clearly
544 identifying deceptive statements compared to SI. These results would be in line with those
545 described by Geiselman (2012), who found that interviewers using the CIS were good at
546 identifying deception as the interview progressed. However, if the CIS made it easier to
547 identify deceptive statements, this would not explain the lack of significant differences
548 observed for deception errors and truth errors in our study. Indeed, if the CIS improves the
549 possibility of detecting deceptive parts, it should also make it possible to avoid mistaking
550 deceptive parts for truthful parts, and mistaking truthful parts for deceptive ones. However,
551 this is not the trend found in the present study. In any case, our small sample size does not
552 allow us to draw conclusions from these analyses and to obtain a sufficient Cohen's *d* (Lakens
553 & Caldwell, 2021). A replication of the study focusing on interviewers' lie detection skills,
554 with a larger sample size, would allow for analysis of the results for this particular issue.

555 **Limitations**

556 As described in the previous section, the first limitation of our study was the small
557 sample size. Indeed, as in the study conducted by Vrij et al. (2015) with police officers,
558 practical constraints meant that the sample size was small and thus that the effect sizes in our
559 analyses of the results were also small. A replication of the study with a larger sample size
560 would increase the effect sizes associated with the significant results.

561 A second major limitation of our study is the absence of a third comparison group, using
562 for example another interview protocol than the CIS. Indeed, the results presented here suggest
563 a benefit of the CIS protocol on the number of gathered details. However, we compared a group
564 of interviewers trained in an interview protocol with a group of untrained interviewers. It is
565 then possible that another interview method could have the same beneficial effects as the CIS.
566 To investigate this question, further replications of this study should include a third group, such
567 as interviewers trained in the PEACE protocol (Walsh & Bull, 2010) or in the structured
568 interview (i.e., CIS without the Mental Context Reinstatement, Report-Everything, Drawing
569 and Reverse Order mnemonics).

570 In addition, the majority (71%) of the participants in this study were women, and all of
571 the participants were first-year psychology students. Since this sample is not representative of
572 the population typically interviewed in customs suspect interviews, this study should be
573 replicated with a more heterogenous population. However, studies have shown that CI (for
574 witnesses/victims) remain effective when used with populations of different ages or socio-
575 economic status. For example, Stein and Memon (2006) pointed out that CI improved the
576 amount of correct information gathered, without increasing the number of errors, from people
577 with a low level of education. Furthermore, a study by Wright and Holliday (2007) showed
578 similar results in terms of information gathering compared to standard interviews when a CI
579 was used with individuals of various ages (young adults, adults and elderly persons). Even so,
580 it would be necessary to confirm these results with suspects, since the studies previously cited
581 involved witnesses and victims.

582 Finally, as discussed below, the interviews in this study were adapted to the customs
583 environment, since the participating investigators belonged to a customs service with specific
584 missions (i.e. mostly drugs and money-related crimes). Thus, the training provided and the
585 study conducted should be repeated with other law enforcement agents, such as police

586 officers. Indeed, the dynamics of other crimes, such as murder or violent crime, may lead to
587 differences in information gathering and the obtaining of confessions. For example, suspects
588 of non-violent crime are more likely to confess their crimes and provide information about
589 them, whereas drug trafficking suspects tend to give few details and are less likely to confess
590 (Deslauriers-Varin, Lussier, & St-Yves, 2011). In addition, customs officers have generally
591 been the object of little interest on the part of researchers and have received little training in
592 the area of suspect interviews (Granhag et al., 2014). Thus, customs officers' SI include
593 behaviors that can be detrimental to information gathering, such as asking a large number of
594 questions, interrupting the interviewees, portraying oneself as an authoritative figure,
595 maximizing, and so on (Noc & Ginet, 2020). Further studies should be conducted to compare
596 the benefit of CIS in standard police interviews, for example.

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752 **Table 1.** True and deceptive version of each of the 4 sequences corresponding to a complete
 753 scenario

	Truthful version	Deceptive version
Sequence 1	The participant goes with a confederate to pick up a transcript in an unknown room of the university	The participant reads a text about this event and has to imagine s/he performed it, so s/he can convince the interviewer that s/he really did so
Sequence 2	The participant sits in a corridor and completes a logic questionnaire	The participant is asked to steal a transcript from a professor's office, but s/he will have to convince the interviewer that s/he completed the logic questionnaire
Sequence 3	The participant goes with a confederate to record a license plate number in the university car park	The participant reads a text about this event and has to imagine s/he performed it so s/he can convince the interviewer that s/he really did so
Sequence 4	The participant sits in a corridor and completes a general knowledge quiz	The participant meets a confederate to exchange an envelope with cash, but s/he will have to convince the interviewer that s/he completed the quiz

Table 2. Four counterbalanced scenario versions

	Sequence 1	Sequence 2	Sequence 3	Sequence 4	<i>n</i>
Scenario A	Truthful	Deceptive	Truthful	Deceptive	12
Scenario B	Deceptive	Deceptive	Truthful	Truthful	11
Scenario C	Truthful	Truthful	Deceptive	Deceptive	11
Scenario D	Deceptive	Truthful	Deceptive	Truthful	11

Table 2. Quantity of details in function of interview style and veracity

Type of details	Interview style									Veracity					
	CIS			SI			F	p	d	Truthful			Deceptive		
	<i>M</i>	<i>SD</i>	<i>CI</i>	<i>M</i>	<i>SD</i>	<i>CI</i>				<i>M</i>	<i>SD</i>	<i>CI</i>	<i>M</i>	<i>SD</i>	
Total	130.71	30.82	[117.69, 143.72]	101.24	31.25	[87.16, 115.60]	10.01	.003	0.97	64.65	19.33	[58.02, 69.63]	52.31	17.15	[45.16, 59.46]
Actions	34.29	10.16	[30.00, 38.58]	23.33	6.73	[20.27, 26.40]	17.63	.001	1.28	15.47	5.82	[13.72, 17.22]	13.71	5.85	[11.86, 15.56]
Objects	65.75	22.05	[56.64, 75.06]	53.19	18.60	[44.73, 61.66]	4.20	.046	0.63	34.69	14.07	[30.46, 38.92]	25.20	9.81	[25.20, 25.20]
Locations	20.88	6.99	[17.92, 23.83]	14.86	6.56	[11.87, 17.84]	8.79	.005	0.91	9.00	3.72	[7.88, 10.12]	9.07	5.07	[7.88, 10.12]
Persons	9.79	3.89	[8.15, 11.43]	9.86	5.29	[7.45, 12.26]	.010	.962	0.00	5.49	3.02	[4.58, 6.40]	4.33	2.71	[4.58, 6.40]

Table 4. Quantity of correct, erroneous and confabulated details in truthful statements

Type of details		Interview style						t	p	Cohen's d
		CIS			SI					
		<i>M</i>	<i>SD</i>	<i>CI</i>	<i>M</i>	<i>SD</i>	<i>CI</i>			
Total	correct details	70.21	21.42	[61.17, 79.25]	56.59	14.84	[48.96, 64.22]	-2.26	.015	0.72
	errors	3.58	1.77	[2.84, 4.33]	3.24	2.86	[1.76, 4.71]	-0.48	.331	0.16
	confabulations	0.67	1.05	[0.22, 1.11]	0.53	.62	[0.21, 0.85]	-0.48	.331	0.16
Actions	correct details	13.08	4.83	[11.05, 15.12]	9.53	3.18	[7.89, 11.27]	-2.65	.012	0.85
	errors	0.13	0.34	[-0.02, 0.27]	0.18	0.39	[-0.03, 0.38]	0.45	.656	0.14
	confabulations	0.25	0.53	[0.03, 0.47]	0.19	0.39	[-0.02, 0.38]	-0.48	.631	0.16
Objects	correct details	40.88	16.20	[34.03, 47.72]	32.29	9.62	[27.35, 37.24]	-2.12	0.21	0.63
	errors	2.79	1.99	[1.95, 3.64]	2.82	2.29	[1.64, 4.00]	0.05	.963	0.14
	confabulations	0.21	0.41	[0.03, 0.38]	0.35	0.61	[0.04, 0.66]	0.91	.369	0.29
Locations	correct details	9.71	4.20	[7.94, 11.58]	7.53	2.59	[6.14, 8.92]	-1.88	.034	0.60
	errors	0.13	0.45	[-0.06, 0.31]	0.12	0.33	[-0.05, 0.29]	-0.06	.955	0
	confabulations	0.08	0.28	[-0.04, 0.20]	0	0	[0, 0]	-1.45	.162	0.39
Persons	correct details	4.71	2.63	[3.59, 5.82]	5.82	3.69	[3.92, 7.72]	1.13	.265	0.36
	errors	0.55	0.78	[0.21, 0.87]	0.12	0.33	[-0.05, 0.29]	-2.38	.012	0.67
	confabulations	0.13	0.34	[-0.02, 0.27]	0	0	[0, 0]	-1.81	.042	0.49

Appendix A

Contextual Backgrounds Given to the Interviewers.

Two criminal events were committed inside the University: a transcript has been stolen from a professor's office, and this document has been sold in exchange for cash. You are going to interview four suspected students. Each of the students may have committed one of these crimes, or both of them, or no crime at all.

Your objective is to find out the truth about what happened. To do this, you will conduct four 45-minute interviews with these students. After the interviews, you will have to judge if each student is guilty or not of the crimes described. You will also have to judge which parts of her/his statement were truthful, and which parts were deceptive.

Two pictures are available to help you prepare your interviews:



Picture of a third-floor room



Picture of cars in the parking lot