

Deception detection: Effects of conversational involvement and probing

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Hartwig, M., Granhag, P. A., Strömwall, L. A., & Vrij, A. Deception detection: Effects of conversational involvement and probing. *Göteborg Psychological Reports*, 2002, 32, No. 2. Research on deception has shown that people's lie detection ability is limited; this holds true for both laypeople and presumed experts. Empirical data suggests that the techniques recommended in police interrogation manuals hamper rather than facilitate accurate veracity judging. Two aspects of these techniques are investigated in this study, namely the degree of conversational involvement (i.e., the amount of active participation in a communication situation) and probing (a suspect is being probed when he or she is asked to answer a previously put question again and/or requested to present additional information). The hypotheses stated that more involved conversational partners would be less accurate lie detectors than less involved conversational partners and observers. Moreover, probing would not enhance deception detection accuracy, but merely increase perceptions of truthfulness. None of the hypotheses found support in the results, although for conversational involvement the means were in the predicted direction. Possible explanations for the lack of effects are discussed.

Key words: Deception detection, interrogation techniques, conversational involvement, probing.

Research on deception has consistently shown that people are poor lie detectors. In experimental settings, accuracy levels are rarely above 60%, where 50% is expected by chance alone (DePaulo, Stone, & Lassiter, 1985; cited in Ekman & O'Sullivan, 1991; Zuckerman, DePaulo, & Rosenthal, 1981). Lie-catchers also exhibit a so-called truth bias, that is, they guess that a message is truthful more often than they guess that it is deceptive. This leads to a higher accuracy rate in identifying truthful messages than deceptive ones (Vrij, 2000).

Research on deception has found only a very weak relationship between confidence and lie detection accuracy, and people have a tendency to be overconfident in their judgments. (DePaulo, Charlton, Cooper, Lindsay & Muhlenbruck, 1997). Moreover, people tend to be more confident when judging a message to be true than when judging a message to be false. This indicates that lie-catchers rarely have a realistic perception of their own performance. Furthermore, presumed experts are generally more

confident in their judgments than laypeople, but not more correct (Ekman & O'Sullivan, 1991).

Objective and subjective indicators of deception

An overview of research on nonverbal indicators of deception shows that liars tend to have a higher-pitched voice, make longer pauses and move their arms, hands, fingers, feet and legs less than truth-tellers (Vrij, 2000). None of the other nonverbal characteristics (e.g., gaze aversion, smiling, eye blinks, self-manipulations and shifting position) seem to be systematically related to deception. It should be noted that these findings do not suggest that all people display all of these cues during deception. What the findings do suggest is that the majority of liars do display these behaviors.

Still, when there are differences in behavior between liars and truth-tellers, why are people so poor at detecting lies? One plausible explanation is that people have stereotypical beliefs about liars' behavior that do not match with how liars actually behave. Research has confirmed this speculation by showing that there are differences between subjective and objective indicators of deception (Zuckerman, DePaulo & Rosenthal, 1981; Strömwall & Granhag, in press). People believe that deception is associated with increased gaze aversion, increased movements (including self-manipulations, movements of hands, fingers, feet, legs and trunk), longer and more frequent pauses, a slower speech rate, a longer latency period between question and answer and more speech disturbances (speech hesitations and speech errors). These behaviors can all be seen as signs of nervousness or the performance of a cognitively complex task. Observers seem to expect that liars feel nervous and act accordingly, or that liars have to think hard and thus show behaviors indicating content complexity. This tendency to search for behaviors indicating nervousness and content complexity is often called the *representativeness heuristic* (Vrij, 2000).

In sum, even though nonverbal cues to deception exist, observers seldom use these cues to make correct judgments concerning veracity.

Deception detection in psycho-legal contexts

As mentioned, presumed experts are no better in detecting lies than are laypeople (Ekman & O'Sullivan, 1991). Still, faith is often put in experts' ability to make correct judgments about truthfulness, as in the case of police interviewing. Since police officers do not seem to be better equipped to make correct judgments than laypeople, the risk of making incorrect judgments is as great as in everyday life (Strömwall & Granhag, in press). However, the consequences of inaccurate judgments in police interviewing are potentially more severe. Therefore, there is reason to ask whether the interrogation techniques employed by the police actually work. Indeed, critical voices question the theoretical foundation on which these techniques rest (see for example Granhag & Strömwall, 1999). Gudjonsson (1992) suggests that there may be fundamental problems connected to police interrogation techniques. According to Gudjonsson, these problems stem from the fact that police interrogation manuals base their techniques on instinct and experience. Zimbardo (1967; cited in Gudjonsson, 1992) argues that interrogation techniques are psychologically sophisticated and coercive. Zimbardo even goes so far as to suggest that they are an infringement of the suspect's dignity and fundamental rights. Moreover, he states that the techniques used in police interviewing may, among other

negative outcomes, encourage false confessions. This opinion is shared by other researchers in the field (e.g., Kassin, 1997).

The critical views of Gudjonsson and Zimbardo are based on scientific research about the psychology of attitudes, compliance and obedience. However, it is important to point out that the existing research is too meager to give strong support to either traditional police interrogations method or the scientific criticism. Thus, in order to be able to draw firm conclusions, interrogations techniques used by the police need to be further examined.

As mentioned, researchers have argued that police interrogation techniques increase the risk of false confessions (Kassin, 1997). Moreover, there is evidence that some of the tactics and techniques used in police interrogations in fact *decrease* the chances of making correct veracity judgments (Gudjonsson, 1992). Studies have shown that compared to passive interrogators, face-to-face interactants evaluate each other with greater leniency and more positivity (Burgoon, Buller, Floyd, & Grandpre, 1996). Police interrogations are conducted in such a face-to-face situation. Moreover, veracity judgments in investigations are often made solely on the basis of these face-to-face interrogations (Gudjonsson, 1992).

As discussed earlier, detecting lies can be very difficult, for both laypeople and professional lie detectors such as police officers (Ekman & O'Sullivan, 1991). What if certain aspects of police interrogations make it even more difficult to detect lies? In order to investigate this possibility, two aspects of police interviewing will be examined in this paper. These two aspects are the degree of conversational involvement between the communicators (the amount of active participation in a communication situation) and probing. A suspect is being probed when he or she, within a certain session, is asked to answer anew a previously put question and/or requested to present additional information (Granhag & Strömwall, 2001). There is little doubt that probing is frequently recommended for putting pressure on suspects, and thus elicit confessions (e.g., Inbau, Reid, & Buckley, 1986; Gudjonsson, 1992). It is also believed that probing makes the guilty suspect more nervous, causing increased leakage of deceptive cues, which makes it easier for lie-catchers to detect lies. As mentioned above, in real-life police interrogations, veracity judgments are often based solely on face-to-face interactions. In sum, there are reasons to investigate the effects of conversational involvement and probing on deception detection, since these aspects are present in real life police interrogations.

Thus, as an attempt to shed some empirical light over the issue of police interrogation techniques, this paper will investigate the effect of conversational interaction on deception detection. Most studies on deception have failed to recognize deception detection performance as context- and interaction-dependent. Therefore, the existing amount of research conducted on the effect of conversational interaction on deception detection ability is far from impressive. However, a few studies have investigated these aspects, but the results stemming from these studies are somewhat mixed.

Previous research on conversational involvement

In studies conducted by Feeley and deTurck (1997), Forrest and Feldman (2000), Burgoon et al. (1996) and Granhag and Strömwall (in press), it is hypothesized that the cognitive and behavioral energy devoted to upholding a conversation make conversational partners inferior lie detectors compared to passive interrogators (e.g., taking part of a videotaped conversation). In other words, judges actively taking part in

the communication with a sender faces a more demanding task than do judges passively taking part of the same communication. This hypothesis is also partly based on the notion of the *honesty effect*; that is to say that an assumption of truthfulness is a part of general conversation maxims; hence, deception ought to be a less frequent attribution by conversational partners than by passive interrogators (Vrij, 2000). To sum up, previous studies have hypothesized that conversational partners are inferior lie detectors compared to conversational observers. The results of the studies mentioned above give some support to the idea that there are differences in lie detection ability between conversational observers and conversational partners; moreover, the results point in the hypothesized direction (Feeley and deTurck, 1997; Forrest and Feldman, 2000; Buller, Strzyzewski, & Hunsaker, 1991; Granhag & Strömwall, in press).

Previous research on probing

A small number of studies have investigated how probing affects deception detection performance. Among these are Buller, Strzyzewski, and Comstock (1991), Stiff and Miller (1986), and Buller, Comstock, Aune, and Strzyzewski (1989). Probing was operationalized as either posing critical questions (the three studies first mentioned), or exposing senders to multiple interrogations (the latter study). In all studies, contrary to predictions, it was found that probing led to more attributions of honesty instead of higher deception detection accuracy. Deceivers obviously exhibited greater behavior management when probed, and arousal cues was masked by a more positive demeanor. In other words, in the studies mentioned above, it seems as if senders managed to control their behavior when confronted with skepticism and thus increased impressions of believability. To sum up, contrary to common expectations, it seems as if probing hampers rather than helps lie detection.

Hypotheses

Thus, in the light of the previous research, the hypotheses were as follows:

Hypothesis 1 In terms of deception detection accuracy, less conversationally involved judges would perform better than more involved judges. In other words, the level of conversational involvement would be inversely related to lie detection accuracy (Forrest & Feldman, 2000). Moreover, more involved judges would judge the senders to be truthful more often than would less involved judges, that is to say that more involved judges would exhibit a more pronounced truth bias than less involved judges (see for example Buller, Strzyzewski, & Hunsaker, 1991).

Hypothesis 2 Probing in an early phase of the interrogation would decrease rather than increase deception detection accuracy, as opposed to the same probing late in the interrogation (see for example Buller, Strzyzewski, & Comstock, 1991). When being probed early, suspects were thought to exhibit a behavior change. When being probed late in the interrogation, the behavior change would be present only during the last phase of the interrogation. Research has shown that judges tend to decide very quickly as to whether someone is telling the truth or not; this means that the behavior exhibited early in the interrogation probably influence the judgment more than do behavior exhibited late in

the interrogation (Ekman, 2001). Probing would also make the truth bias more pronounced (Buller, Comstock, Aune, & Strzyzewski, 1989).

Hypothesis 3 In line with research on the relation between confidence and accuracy, we predicted that confidence would be weakly related to accuracy. Moreover, confidence in the veracity assessments would be higher when judging a message to be truthful than when judging it to be deceptive (DePaulo et al., 1997).

Method

Participants

The sample of judges consisted of 120 undergraduate students from Göteborg University (60 female and 60 male) who volunteered to participate. They were paid the equivalence of 80 SEK (approximately 8 USD). The sample of suspects consisted of 40 undergraduate students from Göteborg University (25 female and 15 male). They were guaranteed a payment equivalent to 80 SEK and were told that, in case they managed to convince a majority of judges that they were telling the truth, they would receive another 200 SEK.

Design

The experiment was a 2 (Probe: Early vs. Late) \times 3 (Involvement: Active interrogator vs. Passive interrogator vs. Mirror observer) \times 2 (Veracity: Truthful vs. Deceptive) between-groups design. In the Early probe condition, suspects were given a suspicious probe early in the interrogation, as opposed to the Late probe condition, where suspects were probed in the end of the interrogation.

The three Involvement conditions included Active interrogators, Passive interrogators and Mirror observers. Active interrogators (conducting the interrogation, posing the questions), were thought to be more involved than the Passive interrogator, (who sat next to the active interrogator, facing the suspect, without posing any questions) who, in their turn, were thought to be more involved than the Mirror observer (who sat in another room and watched the interrogation through a one-way mirror). The Passive interrogator was expected to feel obliged to obey certain conversational rules (such as looking the suspect in the eyes), and hence be more obstructed in detecting deceit than the completely passive Mirror observer. In other words, the three conditions were thought to represent different degrees of involvement. Most previous studies (see for example Burgoon et al., 1996; and Buller, Strzyzewski, and Hunsaker, 1991) have had only two levels of involvement; either participants, who actively took part in a conversation with the sender, or observers, who watched the video-taped version of the same conversation.

Procedure

Interrogations were conducted (and videotaped) using 40 undergraduate students in the role of suspects. Participants were booked in groups of four participants at the time. Upon arrival, they were randomly assigned to one of the following four roles: a) Suspect,

b) Active interrogator, c) Passive interrogator and d) Mirror observer. The suspects were told to wait in a separate room, while the three other participants waited in the laboratory. Half of the times, the suspects were assigned the role of *truthtelling* suspects; half of the times, the suspects were assigned the role of *lying* suspect. For the truthtelling suspects, the procedure was as follows: Upon arrival at the waiting-room, suspects were told by the experimenter that the previous experiment was running a bit late, and that they had to wait for a couple of minutes. On a table in the waiting room, there was some money (700 SEK). A few minutes after the experimenter left the room, a confederate entered the room, claiming to be a participant from the latest experimental session. She picked up a jacket and left. A few minutes later, she entered the room again, this time claiming to have forgotten her keys. She found her keys after looking for them a short time. Right before leaving the room, she grabbed the money from the table while saying that it was payment for her participation in the experiment. A couple of minutes after the confederate's last visit in the room, the experimenter reentered and gave the participant instructions about the coming interrogation. The participant was asked to answer all questions about what had happened in the waiting room as truthfully as possible. After the participant had a couple of minutes to prepare for the interrogation, the experimenters asked the participant to enter the laboratory in order for the interrogation to start.

For the lying suspects, the procedure was as follows: Upon arrival at the waiting room, the participant was given instructions to take 700 SEK from a table if a signal was heard in the room (this signal was heard for all participants in the Deceptive condition). The participant was informed that, if managing to convince a majority of the judges that he/she did not take the money although he/she did, he/she got to keep 200 of the 700 SEK. The participant was then told to wait in the room until the experimenter came back. A few minutes after the experimenter left the room, a confederate entered the room, claiming to be a participant from the latest experiment. She picked up a jacket and left. A short time after the confederate left the room, the signal sounded in the room. Shortly after, the confederate returned, this time claiming to have forgotten her keys. She found her keys after looking for them a short time, and left again. A couple of minutes after the confederate's last visit in the room, the experimenter reentered and gave the participant instructions about the coming interrogation. The participant was asked to lie about the money and blame the confederate for stealing the money. After the participant had a couple of minutes to prepare for the interrogation, the experiments asked the participant to enter the laboratory in order for the interrogation to start.

The interrogations

Before the interrogations, judges received information about the background of the upcoming interrogation (i.e., that money had been stolen from a waiting room, and that the suspect they were about to interrogate and/or see either had or had not taken the money), and that their task was to judge whether the suspect was telling the truth or not. It was pointed out that the information contained in the probing sentence was fake, and only served the purpose to put pressure on the suspect (see below).

The Active interrogator was told not to pose any other questions than the ones given to him or her on a piece of paper by the experimenter, and to pose all of these questions without rephrasing either of them. The Passive interrogator was told not to say anything during the interrogation. The Mirror observer was placed in a room with a one-way mirror, and watched the interrogation from there.

The interrogations consisted of a free recall phase followed by a set of 12 specific questions; the questions were the same for the Early probe condition and the Late probe condition. The questions concerned where they were sitting in the room, how long it took before the person came into the room, where the money was, how much money it was and whether they had taken the money or not. In the Early probe condition, the suspects were probed *before* the free recall phase, while suspects in the Late probe condition were probed after the 12 specific questions. The probe was formulated as follows: “We have interrogated the person who came into the waiting-room [the confederate]. She says that is must have been you who took the money, because the first time she entered the room, she saw the money on the table, but the second time the money was gone. What’s your comment to this?” After the suspect has been given the opportunity to answer to this, the active interrogator continued by saying: “Our judgment is that the person who entered the waiting-room [the confederate] is telling the truth.”

After the interrogation, Active interrogators, Passive interrogators and Mirror observers were asked to rate the truthfulness of the suspect on a dichotomous scale. Participants also rated the degree of confidence in their judgment. Suspects were asked to rate, on a scale ranging from 1 (completely untrue) to 10 (completely true), the degree of truth in the statement they had just given. After this, all participants were debriefed and paid for their contributions. It was checked whether the suspect (both liars and truth-tellers) managed to convince the majority of judges, and those who did received the extra payment. 22 suspects managed to convince a majority of the judges that they did not take the money while 18 failed to do so.

Results

Manipulation check

In order to check whether suspects followed the instructions to tell the truth or lie, a one-way ANOVA with the suspect’s self-rated truthfulness as dependent measure was conducted. A significant effect was obtained, $F(1, 38) = 72.39, p < .001$; with subjects in the Deceptive condition ($M = 5.50, SD = 2.33$) rating their degree of truthfulness as lower than subjects in the Truthful condition ($M = 9.95, SD = 0.22$). Hence, the participants experienced that they did comply with the instructions to lie or tell the truth.

Accuracy

In Table 1, the accuracy results for each condition are presented. Overall, the accuracy level was modest ($M = 53.3\%$). In order to see if and how the different conditions affected accuracy, a logistic regression with accuracy as the dependent variable and Probe (Early vs. Late), Involvement (Active interrogator, Passive interrogator, Mirror observer) and Statement veracity (Deceptive vs. Truthful) as predictor variables was conducted. The analysis showed no significant main effects for either variable (Wald’s $\chi^2[1, N = 120] = 0.92, p > .05$ for Probe conditions; Wald’s $\chi^2[2, N = 120] = 3.48, p > .05$ for Involvement; Wald’s $\chi^2[1, N = 120] = 1.88, p > .05$ for Statement veracity). Furthermore, none of the interaction effects were significant (Wald’s $\chi^2[2, N = 120] = 1.85, p > .05$ for the Probe \times Involvement interaction; Wald’s $\chi^2[1, N = 120] = 1.03, p > .05$ for the Statement veracity \times Probe interaction; Wald’s $\chi^2[2, N =$

120] = 1.75, $p > .05$ for the Statement veracity \times Involvement interaction; Wald's $\chi^2[2, N = 120] = 1.05, p > .05$ for the Statement veracity \times Probe \times Involvement interaction). In other words, Hypothesis 1 was not supported.

Table 1

Accuracy in Percentages for the Experimental Conditions

Condition	Overall accuracy	Truth detection accuracy	Deception detection accuracy
Probe			
Early	48.3	50.0	46.7
Late	58.3	63.3	53.3
Involvement			
Active	47.5	55.0	40.0
Passive	50.0	45.0	55.0
Mirror	62.5	70.0	55.0

Truth bias

Across all conditions, no truth bias was revealed. In other words, there was no significant difference between the number of truth judgments and lie judgments, $\chi^2(1, N = 120) = 0.53, p > .05$ (the mean percentage of truth judgments was 53.3%). The same pattern was found for both the Probe conditions and the Involvement conditions; in other words, there was no effect either for the Early (51.7% truth judgments and 48.3% lie judgments) and Late (55.0% truth judgments and 45.0% lie judgments) probe conditions ($\chi^2[1, N = 60] = 0.07, p > .05$ and $\chi^2(1, N = 60) = .60, p > .05$, respectively) or for the three Involvement conditions (Active interrogator: 57.5% truth judgments and 42.5% lie judgments, $\chi^2[1, N = 40] = .90, p > .05$; Passive interrogator: 45.0% truth judgments and 55.0% lie judgments, $\chi^2[1, N = 40] = 0.40, p > .05$; Mirror observer: 57.5% truth judgments and 42.5% lie judgments, $\chi^2[1, N = 40] = 0.90, p > .05$) on the distribution of truth and lie judgments. Thus, Hypothesis 2, stating that participants in the Early probe condition would make more truth judgments, was not supported by the results.

Confidence

After assessing the veracity of the suspect's statement, participants made a confidence judgment, stating the degree of certainty in their judgments. Mean confidence ratings are presented in Table 2. A 2 (Probe: Early vs. Late) \times 3 (Involvement: Active interrogator vs. Passive interrogator vs. Mirror observer) between-group ANOVA with confidence as dependent variable was run in order to investigate whether there were any differences in confidence due to condition. Neither the Probe conditions ($F[1, 58] = 0.23,$

$p > .05$) nor the Involvement conditions ($F[2, 58] = < 1$, ns) had any effect on the degree of confidence.

Table 2

Mean confidence (%) in the Veracity Judgments for the Experimental Conditions

Condition	<i>M</i>	<i>SD</i>
Probe		
Early	72.53	13.92
Late	72.15	12.56
Involvement		
Active	73.33	13.47
Passive	72.38	13.11
Mirror	71.33	13.29

The accuracy-confidence relation

The overall accuracy-confidence correlation was (non-significantly) positive, $r = .10$, $p > .05$. Moreover, there was no significant difference in confidence when judging a message to be true ($M = 73.8\%$) than when judging it to be deceptive ($M = 70.7\%$), $t(118) = -1.27$, $p > .05$. In other words, hypothesis 3 was not supported in the results.

Discussion

None of the hypotheses found support in the results. In other words, neither probing nor different levels of conversational involvement had any effect on accuracy levels or confidence in the veracity judgments. Moreover, no differences in the distribution of truth judgments across conditions were found; the expected honesty effect for the more involved judges was not found. According to the manipulation check, suspects actually did comply with the instructions to lie or tell the truth; thus it seems plausible that there may be some problems with the manipulation of the probing and conversational involvement. Starting with the probing manipulation, there may be at least three possible explanations for the lack of effects:

- a) The probing was not strong enough to elicit any behavioral changes (for example more signs of nervousness, increased impressions of honesty and so on) on the behalf of the sender; perhaps the interrogator failed to communicate suspicion, or perhaps just one single probe was not enough.
- b) The early probe led to other behavioral changes than did the late probe. Suspects being exposed to the early probe got a chance to give two free recalls of what happened, since the early probe was placed just before the free recall question.

When confronted with suspicions and asked to comment on this, nearly all suspects took the chance to tell their story of what happened in the room. When the free recall question followed, suspects told their story once more. Thus, judges in the Early probe condition had access to two free recall answers, and consequently had access to other cues, for example consistency between these two answers, when judging veracity. This was not possible for judges in the Late probe condition. (It should be noted, however, that suspects in the Late probe condition were given the possibility to comment on the probing, but often did so by just denying guilt instead of giving a long free-recall narrative.) In other words, one can say that the stimulus field differed in quantity and quality for judges in the Early probe and the Late probe condition. It is possible that judges in the Early probe condition used cues such as consistency to a higher extent than did judges in the Late probe condition. Research on subjective cues to deception has shown that when possible to use, consistency is used to a high extent when making veracity judgments; even though consistency is an unreliable cue to deception (Granhag & Strömwall, 2000). In other words, judges in the Early probe condition might have used an unreliable cue to a higher extent than judges in the Late probe condition.

- c) There is a possibility that the probing did in fact elicit behavioral changes, but that the judges misinterpreted these changes as for example surprise or anger (for being wrongfully accused) and hence failed to use the behavioral changes as cues to whether the suspect lied or told the truth.

For the Involvement condition, the mean values were in fact in the predicted direction, but failed to reach significance. Both the active and the passive interrogator were sitting in the same room, facing the suspect, and consequently may have been exposed to very much the same conversational pressure; hence, the difference between these groups with respect to conversational obligations may have been too small. The fact that the honesty effect was no more pronounced in the Active interrogator condition might indicate that these active interrogators felt no more obliged to evaluate the suspect with leniency than did passive interrogators and mirror observers. The fact that there were two interrogators in the interrogation room may have created an impression of “inequality” between the interrogators on one hand, and the suspect on the other. In other words, the active and passive interrogators may have perceived themselves as part of a team of interrogators rather than one of the conversational partners in an “equal” communication; this could have led to a decrease in the feelings of conversational obligations. However, this explanation is acknowledged as purely speculative; moreover, it does not explain why passive interrogators and mirror observers did not outperform active interrogators despite the lesser amount of cognitive and behavioral energy demanded by them.

A problem concerning both the probing and the involvement variables is that the number of participants in each condition is fairly small. This fact could possibly have contributed to the lack of significant results.

Another problem may be that the dichotomous dependent variable was much too insensitive; it may be necessary to develop and use a more sensitive dependent measure.

To sum up, this study was unable to answer the questions about the effects of conversational involvement and probing on deception detection. There is little doubt that the issues of interactional aspects of interrogations and their effects on accuracy in assessing veracity are of great importance, both for the deception research field and for

real-life police interviews; hence, these questions need to be further explored. In future studies though, the manipulation of these variables needs to be more precise.

References

- Buller, D.B., Comstock, J., Aune, R. K., & Strzyzewski, K., D. (1989). The effect of probing on deceivers and truth-tellers. *Journal of Nonverbal Behavior*, *13*, 155-170.
- Buller, D.B., Strzyzewski, K.D., & Comstock, J. (1991). Interpersonal deception: I. Deceivers' reactions to receivers' suspicions and probing. *Communication Monographs*, *58*, 1-24.
- Buller, D.B., Strzyzewski, K.D., & Hunsaker, F.G. (1991). Interpersonal deception: II. The inferiority of conversational partners as deception detectors. *Communication Monographs*, *58*, 25-40.
- Burgoon, J.K., Buller, D.B., Floyd, K., & Grandpre, J. (1996). Deceptive realities: Sender, receiver, and observer perspectives in deceptive conversations. *Communication Research*, *23*, 724-748.
- DePaulo, B.M., Charlton, K., Cooper, H., Lindsay, J.L., & Muhlenbruck, L. (1997). The accuracy-confidence correlation in the detection of deception. *Personality and Social Psychology Review*, *4*, 346-357.
- Ekman, P. (2001). *Telling lies: Clues to deceit in the marketplace, politics, and marriage*. New York: Norton.
- Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist*, *46*, 913-920.
- Feeley, T.H. & deTurck, M.A. (1997). *Perceptions of communications as seen by the actor and as seen by the observer: The case of lie detection*. Paper presented at the International Communication Association Annual Conference, Montreal, Canada, 1997.
- Forrest, J.A., & Feldman, R.S. (2000). Detecting deception and judge's involvement: Lower task involvement leads to better lie detection. *Personality and Social Psychology Bulletin*, *26*, 188-125.
- Granhag, P.A., & Strömwall, L.A. (1999). Repeated interrogations: Stretching the deception detection paradigm. *Expert Evidence*, *7*, 163-174.
- Granhag, P.A., & Strömwall, L.A. (2000). Effects of preconceptions on deception detection and new answers to why lie-catchers often fail. *Psychology, Crime & Law*, *6*, 197-218.
- Granhag, P.A., & Strömwall, L.A. (2002). Repeated interrogations: Verbal and non-verbal cues to deception. *Applied Cognitive Psychology*, *15*, 1-15.
- Granhag, P.A., & Strömwall, L.A. (in press). Deception detection: Interrogators' and observers' decoding of consecutive statements. *The Journal of Psychology – Interdisciplinary and Applied*.
- Gudjonsson, G.H. (1992). *The psychology of interrogations, confessions and testimony*. Chichester: John Wiley.
- Inbau, F.E., Reid, J.E., & Buckley, J.P. (1986). *Criminal interrogation and confessions*. Williams and Wilkins: Baltimore.
- Kassin, S.M. (1997). The psychology of confession evidence. *American Psychologist*, *52*, 221-233.

- Stiff, J.B., & Miller, G.R. (1986). 'Come to think of it...': Interrogative probes, deceptive communications, and deception detection. *Human Communication Research*, 12, 339-357.
- Strömwall, L.A., & Granhag, P.A. (in press) How to detect deception? Arresting the beliefs of police officers, prosecutors and judges. *Psychology, Crime and Law*.
- Vrij, A. (2000). *Detecting lies and deceit: The psychology of lying and its implications for professional practice*. Chichester: John Wiley & Sons.
- Zuckerman, M., DePaulo, B.M., & Rosenthal, R. (1981). Verbal and nonverbal communication of deception. In L. Berkowitz (Ed.), *Advances in experimental social psychology*. Vol. 14, 1-57. New York: Academic Press.