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Vrij, A.; Semin, G.R.

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LIE EXPERTS' BELIEFS ABOUT NONVERBAL INDICATORS OF DECEPTION

Aldert Vrij and Gün R. Semin

ABSTRACT: Beliefs about behavioral clues to deception were investigated in 212 people, consisting of prisoners, police detectives, patrol police officers, prison guards, customs officers, and college students. Previous studies, mainly conducted with college students as subjects, showed that people have some incorrect beliefs about behavioral clues to deception. It was hypothesized that prisoners would have the best notion about clues of deception, due to the fact that they receive the most adequate feedback about successful deception strategies. The results supported this hypothesis.

In deception research a distinction is usually made between actual and perceived indicators of deception (DePaulo, Stone, & Lassiter, 1985; Zuckerman, DePaulo, & Rosenthal, 1981). Actual indicators of deception consist of nonverbal behaviors which have been found to be associated with deception. Perceived indicators of deception are nonverbal behaviors that observers associate with deception, regardless of whether such behavior is a manifestation of actual deception.

Meta-analyses of actual indicators of deception (DePaulo, 1992; DePaulo et al., 1985; Ekman, 1989; Vrij, 1991; Zuckerman & Driver, 1985; Zuckerman et al., 1981) provide empirical evidence that deceiving others is correlated with several nonverbal behaviors, such as an increase in speech disturbances (both more ahs and non-ahs), a higher-pitched voice, a slower speech rate, a longer latency period, and a decrease in leg/foot movements and hand/arm movements. The emotional, cognitive, and control approaches have been offered to explain these findings.

In the emotional approach (Knapp, Hart, & Dennis, 1974; Köhnken, 1989; Riggio & Friedman, 1983) it is emphasized that deceiving causes physiological reactions, such as high blood pressure, increased heart rate, and increased respiration rate. The physiological reaction is the conse-

Address correspondence to Aldert Vrij, University of Portsmouth, Department of Psychology, King Charles Street, Portsmouth PO1 2ER, United Kingdom.

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quence of arousal that is associated with deception. The arousal is a result of guilt, of being aware of doing things which one is not allowed to do. Or arousal may be a result of fear, fear of being caught. Therefore, during deception people tend to behave nervously, using a high-pitched voice and speech disturbances (Siegman, 1985).

In the cognitive approach (Burgoon, Kelly, Newton, & Keely-Dyreson, 1989; Ekman & Friesen, 1972; Goldman-Eisler, 1968; Köhnken, 1989) it is stated that deception is a cognitively complex task. It is assumed that it is more difficult to fabricate a plausible and convincing lie consistent with everything the observer knows or might find out than to tell the truth. There is evidence to suggest that people engaged in cognitively complex tasks wait longer with giving their answers, speak with a slower speech rate, and make more speech disturbances (Goldman-Eisler, 1968). Moreover, Ekman and Friesen (1972) showed that conducting cognitively complex tasks results in a neglect of body language, reducing overall animation.

According to the control approach, liars tend to control their behavior, in order to avoid giving away possible nonverbal cues of deception and to make a credible (reliable) impression (DePaulo, 1988, 1992; DePaulo & Kirkendol, 1989; Ekman, 1989; Köhnken, 1990). Liars, for instance, believe that movements will make them appear suspicious. Therefore, they will move very deliberately and tend to avoid those movements which are not strictly essential. This results in an unusual degree of rigidity and inhibition.

We would like to point out here that differences between liars and truth tellers are very small. This is one of the reasons why lies are so difficult to detect on the basis of nonverbal behavior displayed by deceivers (Vrij, 1994).

Meta-analyses concerning perceived indicators of deception (DePaulo, 1992; DePaulo et al., 1985; Ekman, 1989; Vrij, 1991, 1993b; Zuckerman & Driver, 1985; Zuckerman et al., 1981) provide empirical evidence that observers associate deception with a variety of nonverbal behaviors, such as many speech disturbances (more ahs and non-ahs), a higher-pitched voice, a slower speech rate, a longer latency period, more gaze aversion, and more movements (many self-touches, many movements of the trunk, shifting positions, and many hand, arm, leg, and foot movements). A possible explanation of why observers associate deception with an increase in movements is that they assume that liars are nervous and that they will behave nervously (Knapp, Dennis, & Hart, 1974; Köhnken, 1989; Kraut & Poe, 1980; Riggio & Friedman, 1983).

A comparison of the research findings concerning actual and perceived indicators of deception shows that observers are not very knowledgeable about actual indicators of deception. Firstly, they associate more

nonverbal behaviors with deception than in fact indicate deception. For example, perceived indicators such as gaze aversion, trunk movements, self-touches, and shifting positions are not actual indicators of deception. Secondly, observers believe that deception is associated with an *increase* in movements, while, in fact, actual deception is associated with a *decrease* in movements.

Research concerning perceived indicators of deception has been conducted in different Western countries, including Germany, Great Britain, the Netherlands, and the United States (Höfer, Köhnken, Hanewinkel, & Bruhn, 1992; Kraut, 1978; Vrij, Foppes, Volger, & Winkel, 1992; Vrij & Winkel, 1992; West, 1992). In spite of this variety in research locations, the findings are highly similar. Hence, it appears that there exist clear and unanimous but wrong beliefs among observers in different cultures about the relationship between nonverbal behavior and deception. However, the previous studies concerning perceived indicators of deception suffer from one important limitation. Most of these studies examined college students, who may not have had any special reason to learn how to tell when someone is lying. Perhaps lie experts, those whose work requires them to detect lying, would be more accurate.

In the present study concerning perceived indicators of deception, different groups of lie experts participated, namely patrol police officers, police detectives, customs officers, prison guards, and prisoners. Also, college students participated in the study, offering the possibility to make a comparison between lie experts and lay people in order to find out to what extent daily-life experience of lie experts in detecting lies contributes to an increased understanding of perceived indicators of deception.

It seems plausible to assume that daily-life experience in detecting lies results in a better insight among lie experts only when they receive adequate outcome feedback, that is, information whether their truth/lie judgments are either right or wrong. In daily life, such outcome feedback is usually lacking (DePaulo & Pfeifer, 1986; Ekman & O'Sullivan, 1991; Vrij, 1993a). For example, customs officers will never find out whether or not the travelers they decide not to search further are smuggling goods.

In our study the subjects who are likely to have the most adequate feedback are prisoners. Criminals live in a culture that is a much more deceptive one than the world the rest of "normal" people live in. Associating with other criminals as well as generally unsavory people in the underworld may expose any sample of prisoners to a great deal of posing, bluffing, threats, promises, "cons," and so forth, many of which may be false or dishonest. Being successful in such a world depends in part on the ability to tell when you are being lied to. Hence, we hypothesized that prisoners

would have the best notion about the nonverbal behavior-deception relationship.

Method

Subjects

A total of 212 subjects participated in the study (83 college students, 20 prisoners, 42 customs officers, 29 police detectives, 17 prison guards, and 21 patrol police officers). Of the subjects, 70 per cent were male and 30 per cent were female. The average age was 30 years. Almost all the lie experts (93%) indicated that they had considerable experience with detecting deception. The average work experience of lie experts (except prisoners) was 12 years. The college students were undergraduate psychology students at the Free University in Amsterdam. All customs officers worked at Schiphol International Airport in Amsterdam. The police detectives in this study had enrolled for a specialized police detective course at the College for Criminal Investigation & Crime Control. All patrol police officers worked at the same local police force in Holland. Finally, prison guards and prisoners were recruited from two prisons. The prisoners were sentenced for a variety of crimes, including incendiarism, hold-up, dealing drugs, and murder. Analyses revealed differences in gender, age, and work experience between the groups ($\chi^2(5, N=212) = 49.94$, $p < .001$; $F(5, 202) = 33.09$, $p < .001$; $F(3, 104) = 4.40$, $p < .01$, respectively). No differences emerged in experience with detecting deception among the various groups of lie experts, $F(4, 124) = .88$, *ns*. Table 1 shows the differences. Table 1 shows that relatively more students were female. Also, Table 1 shows that students were younger than the other groups of participants. Prison guards had relatively less work experience.

Procedure

The beliefs about nonverbal indicators of deception were investigated by means of a questionnaire. The study took place in the subjects' workplace and was introduced as a study to investigate people's opinions about indicators of deception. All people who were available when the research was conducted were tested.

A total of 16 nonverbal behaviors were mentioned in the questionnaire. We chose behaviors that are frequently investigated in previous studies (DePaulo et al., 1985; Zuckerman et al., 1981; Zuckerman & Driver, 1985), namely: (1) gaze behavior, (2) smiling, (3) head movements,

TABLE 1

Gender, Age, and Work Experience Distributions in the Sample Groups

Group	Women (%)	Age (in years)	Work experience (in years)
Students	53%	24.24	—
Prisoners	0%	30.31	—
Customs officers	19%	32.14	10.93
Police detectives	4%	36.82	15.00
Prison guards	23%	37.73	8.52
Patrol police officers	29%	34.38	13.38

(4) trunk movements, (5) shifting positions, (6) foot/leg movements, (7) gestures, (8) self-touches, (9) hand and finger movements, (10) shoulder shrugs, (11) response length, (12) speech rate, (13) latency period, (14) ah-filled pauses, (15) non-ah speech disturbances, and (16) pitch of voice. A brief explanation of the behaviors was included for most behaviors.[1] For each behavior, subjects had to indicate their opinion about the relationship with deception on forced-choice answer scales. We give one example, making trunk movements:

A. Liars make *more* trunk movements than truth tellers
B. Liars make *less* trunk movements than truth tellers
C. Liars make *as many* trunk movements as truth tellers
D. No opinion

Finally, the subjects filled out a questionnaire regarding their background characteristics (gender, age, work experience in years, and experience in detecting deception, which was rated on a 7-point scale rating from (1) not at all to (7) a lot of).

Results

In order to examine possible differences between the groups of subjects in their beliefs about nonverbal indicators of deception, the data were analyzed in two steps. Firstly, we examined differences among the professional lie detectors, that is, customs officers, detectives, prison guards, and patrol police officers (we expected no differences among them). Data were

analyzed utilizing Kruskal-Wallis one-way analyses of variance.[2] Results showed that only 1 out of 16 behaviors revealed a significant difference. This could be expected by chance (5%). Hence, the different groups of professional lie detectors had similar beliefs about the nonverbal behavior-deception relationship, and were grouped together for the second analysis. This group will be referred to as "professional lie detectors."

Secondly, differences between college students, prisoners, and professional lie detectors were examined, again by utilizing Kruskal-Wallis one-way analyses of variance.[3] Table 2 provides the outcomes of the analyses and the mean scores for the 16 behaviors.

Table 2 reveals six significant differences between prisoners and college students (regarding gaze behavior, postural shifts, hand and finger movements, foot and leg movements, self touches, and shoulder shrugs),

TABLE 2

Differences in Beliefs About Perceived Indicators of Deception in the Different Groups

	Group		
Behavior	Students	Prisoners	Professional lie detectors
Gaze aversion	.78[a]	.33[b]	.73[a]
Smiles	.28[a]	.06[a]	.24[a]
Head movements	.33[a]	.36[a]	.43[a]
Trunk movements	.24[a]	.13[a]	.34[a]
Postural shifts	.63[b]	−.17[a]	.67[b]
Gestures	.04[a]	−.06[a]	.40[b]
Hand/finger movements	.48[b]	−.11[a]	.59[b]
Foot/leg movements	.71[b]	.33[a]	.72[b]
Self touches	.64[b]	.38[a]	.67[b]
Shoulder shrugs	−.04[a]	.41[b]	.44[b]
Response length	.06[a]	.06[a]	.24[a]
Speech rate	.51[a]	.26[a]	.34[a]
Latency period	−.10[a]	.06[a]	.29[a]
Ah-filled pauses	.32[a]	.33[a]	.51[a]
Non-ah speech disturbances	.64[a]	.38[a]	.54[a]
Pitch of voice	.34[a]	.13[a]	.31[a]

Note. Only differences with a different superscript within a row are significant ($p < .05$).

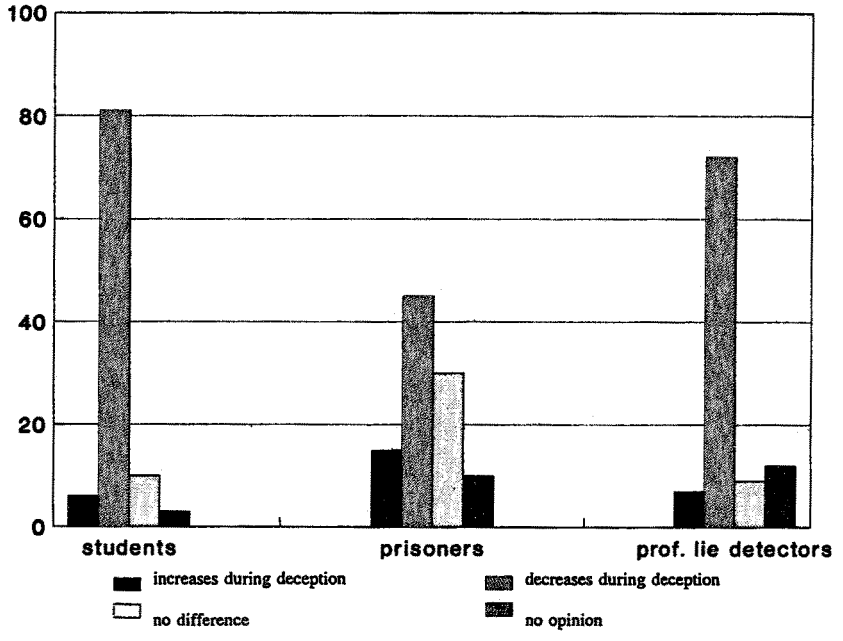

Figure 1. Gaze behavior (-) [*Note.* The signs following the behaviors in the captions for Figures 1 to 7 refer to the actual behavior–deception relationship (">" = increase during deception, "<" = decrease during deception, "-" = no relationship with deception.]

six significant differences between prisoners and professional lie detectors (concerning gaze behavior, postural shifts, gestures, hand and finger movements, foot and leg movements, and self touches), and two significant differences between college students and professional lie detectors (regarding gestures and shoulder shrugs). Hence, differences are mainly caused by prisoners who held different beliefs about behavioral clues to deception compared to the other two groups.

A comparison of mean scores related to these significant differences showed almost a consistent pattern. With the exception of shoulder shrugs, college students and professional lie detectors associated deception more strongly with an increase in the described behaviors than prisoners. Figures 1 to 7 provide a more detailed insight into the differences between the three groups (in these graphs the "no opinion" answers are also included).

Although gaze behavior (Figure 1) is not an actual indicator of deception, many college students and professional lie detectors indicated that gaze aversion is associated with deception. The actual relationship (no relationship) was mentioned most frequently by prisoners.

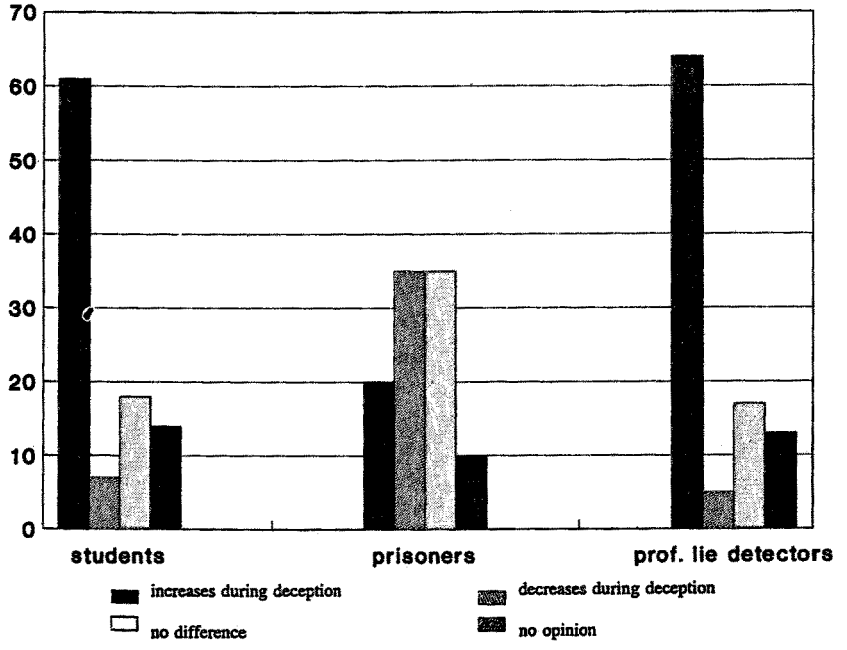

Figure 2. Shifting positions (-).

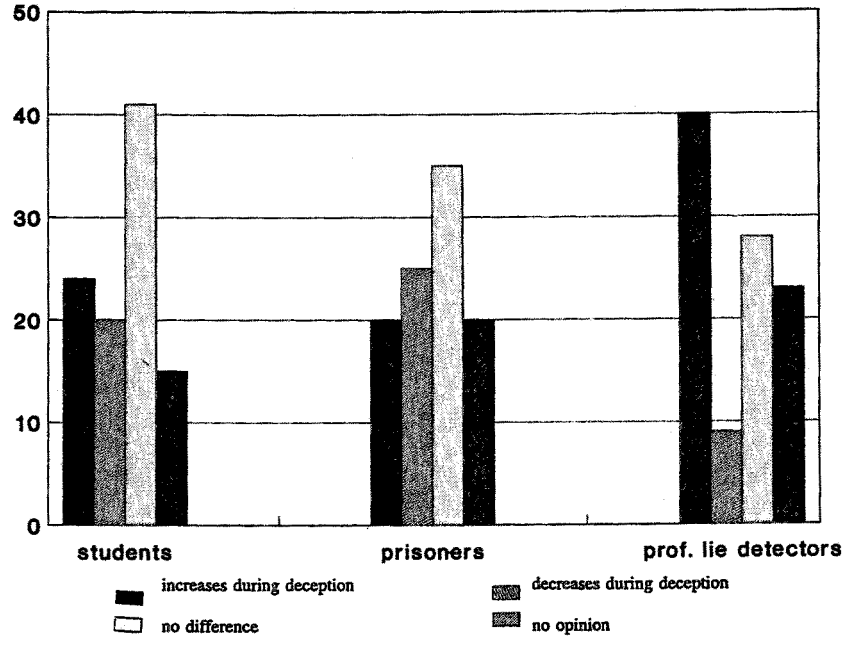

Figure 3. Gestures (-).

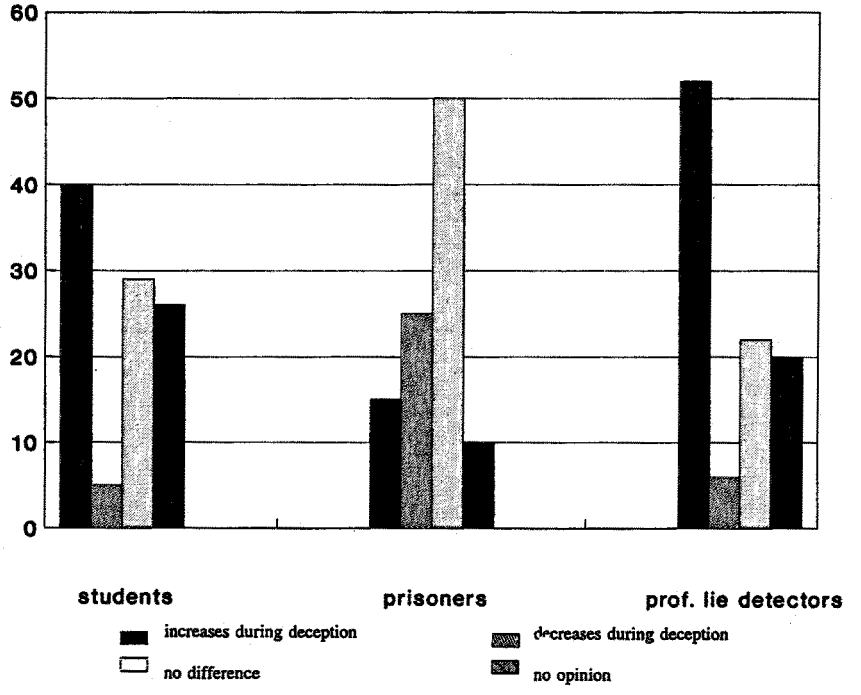

Figure 4. Hand and finger movements (<).

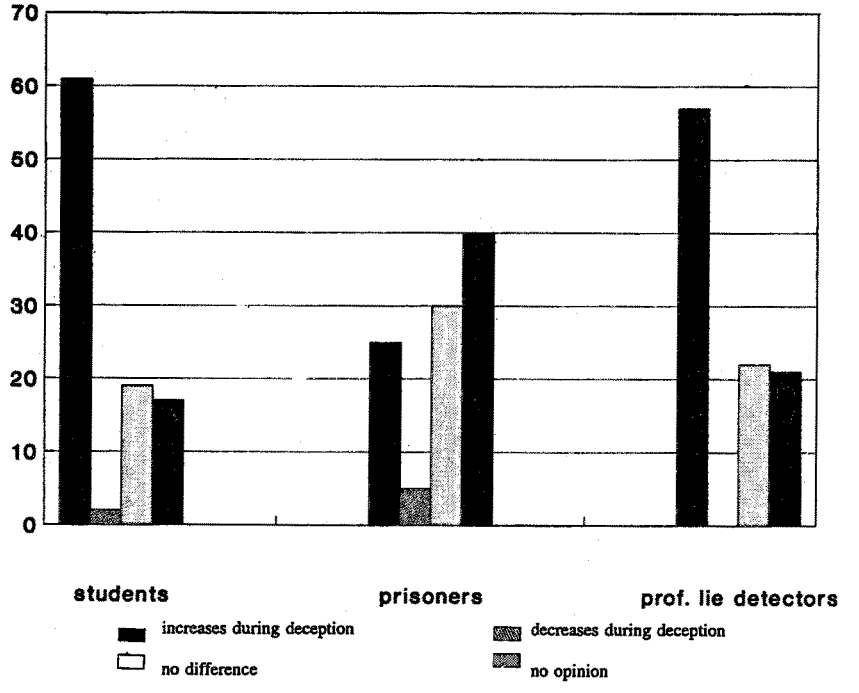

Figure 5. Foot and leg movements (<).

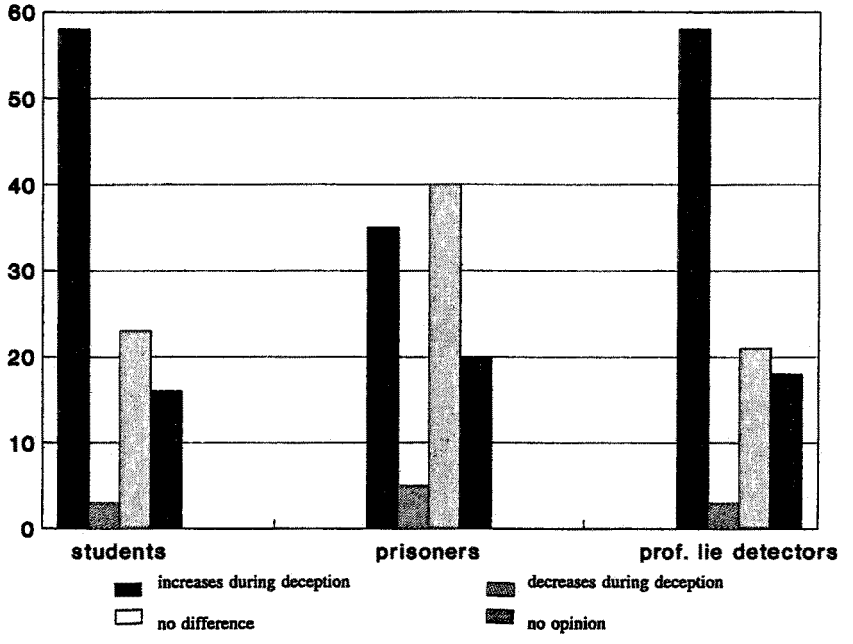

Figure 6. Self touches (-).

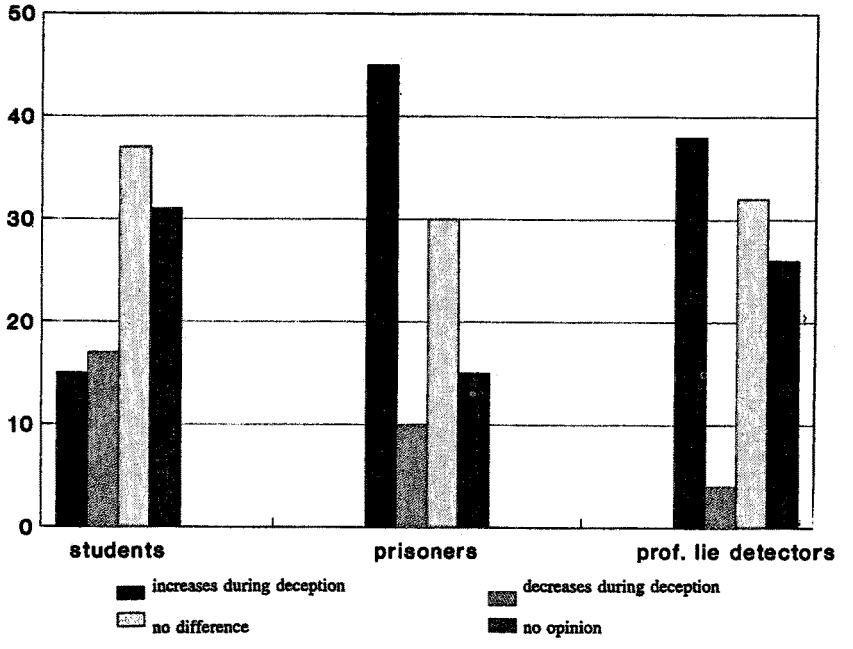

Figure 7. Shoulder shrugs (-).

Also shifting positions (Figure 2) is not an actual indicator of deception. Especially college students and professional lie detectors, however, indicated an increase in shifting positions as a perceived indicator of deception. Again, relatively more prisoners mentioned the correct relationship (no relationship).

Gestures (Figure 3) are not actual indicators of deception, but professional lie detectors especially mentioned an increase in gestures as an indicator of deception.

A decrease in hand and finger movements (Figure 4) is an actual indicator of deception, and relatively more prisoners marked this relationship. College students and professional lie detectors mainly associated an increase in such movements with deception.

Although a decrease in foot and leg movements (Figure 5) is an actual indicator of deception, many college students and professional lie detectors mentioned that an increase in such movements is associated with deception.

Self touches (Figure 6) are not an actual indicator of deception, but many college students and professional lie detectors indicated an increase in self touches as an indicator of deception. The actual relationship (no relationship) was mentioned most frequently by prisoners.

Shoulder shrugs (Figure 7) are not an actual indicator of deception. However, prisoners and professional lie detectors, especially, indicated an increase in shoulder shrugs as a perceived indicator of deception. The correct relationship (no relationship) was equally mentioned by the three groups.

Concerning the other nine nonverbal behaviors no differences emerged among the groups of subjects. Results related to these behaviors are displayed in Table 3.

Table 3 shows that many subjects associated an increase in smiling, head movements, and trunk movements with deception while, actually, these behaviors are not associated with deception. Moreover, it is remarkable that many subjects associated a faster speech rate with deception while, actually, a slower speech rate indicates deception. Finally, many subjects held correct beliefs about the relation of ah-filled pauses and non-ah speech disturbances to deception.

To examine the correctness of the groups' beliefs concerning indicators of deception, we calculated their accuracy score, that is the percentage of right answers. The correct answers are those answers indicating the actual relationship. For example, concerning gaze behavior "no relationship" (the actual relationship) was the correct answer, whereas concerning hand and finger movements "a decrease in such movements" was the correct answer. All the separate groups (college students, prisoners, customs

TABLE 3

Beliefs About Perceived Indicators of Deception

Behavior	>	<	–	No opinion
Smiles (–)	39%	19%	25%	17%
Head movements (–)	37%	8%	30%	25%
Trunk movements (–)	32%	12%	28%	28%
Response length (<)	40%	27%	18%	15%
Speech rate (<)	46%	12%	27%	15%
Ah-filled pauses (>)	43%	6%	39%	12%
Non-ah speech dist. (>)	52%	5%	27%	16%
Latency period (>)	40%	25%	19%	16%
Pitch of voice (>)	24%	3%	41%	32%

Note. The signs following the behaviors refer to the actual behavior-deception relationship (">" = increase during deception, "<" = decrease during deception, "–" = no relationship with deception). The percentages refer to people's beliefs about behavioral clues to deception. The first column indicates the percentage of subjects who associated an increase in the behavior with deception, the second column indicates the percentage of subjects who associated a decrease in the behavior with deception, the third column indicates the percentage of subjects who didn't associate the behavior with deception, and the fourth column indicates the percentage of subjects who did not have an opinion about the behavior-deception relationship.

officers, police detectives, prison guards, and patrol police officers) were included. Table 4 shows the accuracy rates for the groups.

Table 4 shows that, in line with our expectations, prisoners did obtain the highest accuracy rate (32%). Their accuracy rate differed significantly from the accuracy rates of students, customs officers, police detectives, and patrol police officers.[4] The hypothesis that prisoners would have the best notion about the nonverbal behavior-deception relationship was thus supported.

In order to find out whether demographic characteristics (gender, age, years of work experience, experience with detecting deception) influenced the accuracy rate, further analyses were conducted. The accuracy rate for males (M = .24) and females (M = .26) did not differ significantly from each other, $F(1, 210) = 1.09$, *ns*. Moreover, neither age, $r(212) = -.10$, *ns*, nor years of work experience, $r(109) = .07$, *ns*, were significantly correlated with accuracy rate. Finally, experience with detecting deception was not significantly correlated with accuracy rate, $r(129) = .15$, *ns*.[5] Hence, we may conclude that the investigated demographic characteristics did not affect the accuracy rate.

TABLE 4

Accuracy Rates in the Different Groups

Group	Accuracy
Students	.25[a]
Prisoners	.32[b]
Customs officers	.22[a]
Police detectives	.22[a]
Prison guards	.23[a]
Patrol police officers	.24[a]

Note. Only differences with a different superscript are significant ($p < .05$).

Discussion

In the present study the beliefs of lie experts (prisoners, customs officers, police detectives, prison guards, and patrol police officers) and inexperienced lie catchers (college students) about the nonverbal behavior-deception relationship were investigated. Results showed that prisoners had the best notion of this relationship. The beliefs of college students and professional lie detectors were less adequate but highly similar to each other. Hence, lie experts who consider detecting lies as their daily-routine job had the same stereotyped beliefs about nonverbal indicators of deception as inexperienced lie catchers. Thus, it appears that work experience does not contribute to a better understanding of these issues.

The fact that lie experts had incorrect beliefs about indicators of deception makes workshops on behavioral clues to deception relevant. The main aim of these workshops is to rid lie experts of their incorrect stereotyped beliefs.

We will conclude with three remarks. Firstly, our assumptions about nonverbal clues to deception are based upon previous studies concerning deception. In these studies the stakes are usually pretty low, and therefore, differ from lying in a police context or customs context in which the stakes are usually high. It may be that behavioral clues to deceit differ in low- and high-stakes situations. Further research is needed to investigate this. Anticipating this study it is likely that the outcomes will strengthen the pattern found in previous studies. For instance, in high-stakes situations liars will be more motivated to get away with their lies, and, as a meta-analysis

(Zuckerman & Driver, 1985) showed, highly motivated liars make fewer movements than less motivated liars, probably due to the fact that highly motivated liars try harder to control their behavior and consequently move less and display more behavioral rigidity.

Secondly, we asked our subjects to indicate behavioral clues to deception in a certain context. In this situation beliefs of college students and professional lie detectors (patrol police officers, detectives, customs officers, and prison guards) did not differ from each other. It may be that a different pattern will emerge when we ask these groups of people to indicate behavioral clues to deception within a different context, for instance after showing them a videotape of people who were lying or telling the truth. It may be that in such a task professional lie detectors, because of their work experience, are better than students in selecting the relevant cues indicating deception. However, the fact that professional lie detectors have difficulties in detecting deception in deception studies, that is, their percentages of correct answers usually do not exceed the level of chance (Köhnken, 1987; Kraut and Poe, 1980; Vrij, 1993a) does not make it very likely that they will benefit from such a "within a context" situation.

Thirdly, the central aim of the present study was to investigate beliefs about nonverbal behavior and deception. We did not investigate to what extent lie experts use behavioral clues in detecting deception. Therefore, on the basis of this study we cannot predict, for instance, that travelers who display "nervous behavior" (making many movements) are more likely to be approached by customs officers for a search of their luggage than travelers who do not display nervous behavior, since we do not know whether customs officers use behavioral clues to make these decisions. However, we can conclude that when they indeed use behavioral clues to decide whether or not to search somebody's luggage, they won't be very successful in catching smugglers.

Notes

1. For instance, *gestures*: hand and arm movements designed to modify and/or supplement what is being said verbally; *hand and finger movements*: a hand movement is a movement of a hand without the arm being moved; finger movements are movements of fingers without hands or arms being moved.
2. Prior to the analysis the data were recoded so that -1 = liars do it less, 0 = no difference, and $+1$ = liars do it more, leaving out "no option."
3. In order to investigate differences between the three groups in using the "no opinion" answer, additional chi-square tests were conducted after recoding the data so that 1 = giving an answer (score 1, 2, or 3) and 2 = no opinion (score 4). None of the 16 chi-squares was significant, indicating no differences between the groups in using the "no opinion" answer.

4. A pooled error term across all the groups was used for conducting the *t*-tests. The t-values related to the comparions between prisoners and (1) students, (2) customs officers, (3) police detectives, (4) prison guards, and (5) patrol police officers were $t(206) = 1.79$, $p < .05$; $t(206) = 2.41$, $p < .05$; $t(206) = 2.28$, $p < .05$; $t(206) = 1.74$, $p < .05$; and $t(206) = 1.71$, $p < .05$, respectively.
5. Also, analyses within each group showed no significant effects.

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