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Actual and Perceived Cues to Deception: A Closer Look at Speech

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Previous research has shown both that speech can reliably reveal whether or not deception is occurring and that perceivers are often strongly influenced by speech in their judgments about deceit. Nonetheless, there are relatively few studies of verbal cues to deceit. In the present study, we examined specific verbal and paralinguistic cues that might reveal when deception is occurring or that might be used by perceivers in their attempts to detect deception; also, we examined quantitatively the correspondence between actual cues to deception and perceived cues to deception. For the cues that we studied, the degree to which the cues actually were associated with deception corresponded significantly to the degree to which perceivers used those cues as signs of deceit. When senders pretended to like people they really disliked, their descriptions were less positive and more neutral than when they honestly described people they really did like. When feigning disliking, senders uttered more nonfluences than when expressing honest disliking. All of these cues were used by perceivers in their judgments of deceptiveness; in addition, perceivers judged as deceptive descriptions that were spoken slowly and contained many um's and er's. Expressions of liking that contained many other-references, few self-references, and many nonspecific (undifferentiating) descriptors were also perceived to be deceptive. To facilitate the study of actual and perceived cues deception, and their correspondence, a heuristic model was proposed.

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In a recent review of cues to deception, Kraut (1980) has pointed out that most cues that have been studied have been nonverbal ones; verbal cues, by contrast, are noticeably underrepresented in the extant literature. In fact, Kraut found only one verbal cue (amount of detail) that had been examined in more than one study, and that cue did not reliably distinguish truth from deception across studies. There are probably several reasons for this emphasis on nonverbal rather than verbal cues. First, there has been an assumption in much of the research on deception that nonverbal cues, since they are presumably less readily controlled by the liar, might be more revealing of the liar's true affective state than are verbal cues. Historically, this notion has been traced back to Darwin (1872) and to Freud (1959); more recently, it has been elaborated in the theory and research of Ekman and Friesen (1969; Ekman, 1981). A second reason why verbal cues might be underrepresented in research on cues to deception is a more practical one; that is, the scarcity of widely used and theoretically relevant scoring systems for measuring and categorizing verbal content.

The accumulating evidence on the perpetration and detection of deception suggests both that the verbal stream might in fact contain important cues to deceit and that perceivers do use verbal cues in their judgments about other people's truthfulness. DePaulo, Zuckerman, and Rosenthal (1980) recently reviewed more than 20 studies of perceivers' accuracy at detecting lies from either face cues, body cues, tone of voice (filtered speech), verbal cues (words only), audio cues (words plus tone of voice cues), or audiovisual cues (words plus tone plus visual cues). They concluded that perceivers were strikingly more accurate at detecting lies when they had access to verbal cues (verbal, audio, and audiovisual conditions) than when only nonverbal cues were available (face, body, and tone conditions). Of the three modalities that included words, accuracy was highest in the audio condition (although not significantly higher than in the verbal or audiovisual conditions). These results suggest that the speech of liars might contain cues that can be effectively used by perceivers in their attempts to detect lies. Corroborating evidence comes from a study in which all perceivers were given full audiovisual access to the liars but some of the perceivers were told to pay special attention to the visual cues, others were told to pay special attention to the words, others were told to pay special attention to the tone, and the rest were given no special attention instructions (DePaulo, Lassiter & Stone, 1982); in that study, perceivers were more accurate at detecting lies in the attend-to-words and (especially) in the attend-to-tone conditions than in the visual or control conditions. Thus, perceivers are especially accurate at detecting lies when verbal cues are available to them (DePaulo et al., 1980) and they can improve somewhat on their usual accuracy when advised to pay special attention to some aspect of the stream of speech (DePaulo et al., 1982).

Ekman, Friesen, O'Sullivan, and Scherer (1980) studied the relative importance of face, body, and speech (words plus tone) cues in judgments of the personality and affect of people who were either lying or telling the truth. They found, for three samples of perceivers, that when the senders were lying, judgments made from speech cues correlated more highly with judgments made from the "whole person" (audiovisual condition) than did judgments made from either face or body cues. This suggests that when forming impressions of people who are lying, perceivers may be more influenced by the liars' speech than by their face or body cues.[1]

The findings that speech cues do reliably reveal whether or not deception is occuring and that perceivers are strongly influenced by speech cues in their judgments of liars suggest three further questions:

1. What specific verbal or paralinguistic cues actually do distinguish deception from truth;

2. What verbal or paralinguistic cues do perceivers use in their judgments about honesty and dishonesty; and, most importantly,

3. What is the correspondence between the cues that really do distinguish deception from truth ("actual cues to deception") and the cues that perceivers use in their judgments ("perceived cues to deception")? Examining the role of specific cues as both actual and perceived indicators of deception will yield a more fine-grained portrayal of the ways in which deception is perpetrated, diagnosed, and misdiagnosed.

Although numerous studies have examined cues that might actually distinguish truth from deception, such as response latency, response length, rate, pitch, and fluency, and several other studies have investigated many of these same cues as they are used by perceivers in their judgments about deceit, there are fewer instances in which actual cues to deception and perceived cues to deception have been examined in the same study. Even in these instances, very few of the cues were verbal cues (see Knapp & Comadena, 1979; Kraut, 1980; and Zuckerman, DePaulo & Rosenthal, 1981, for reviews). Of the studies that have examined both actual and perceived cues to deception, the three that examined more than two cues (Kraut, 1978; Kraut & Poe, 1980; Krauss, Geller & Olson, Note 1) have all shown that the number of cues that perceivers used to judge deception (to a statistically significant degree) exceeded the number of cues that did reliably distinguish truth from deceit.

We would like to suggest the use of two modes of presentation and analysis which might facilitate the study of cues to deception. First, an exact quantitative assessment, for each cue, of the degree of association between

[1]A similar conclusion has been reached based on studies not involving deception. Thus, Krauss, Apple, Morency, Wenzel, and Winton (1981) have shown, in two studies, that perceivers' evaluative judgments are better predicted by verbal than by visual information.

the cue and deception, and between the cue and perceived deceit, should be provided. These two sets of numbers, representing the extent to which each cue is associated with deception, and is perceived to be associated with deception, can then be correlated with each other to yield a single correlation coefficient indicating the degree of correspondence between actual and perceived cues in that study. This correlation will of course vary with the particular cues that the researchers have decided to examine, but it does accurately and succinctly summarize the covariance between actual and perceived cues for the particular set of cues in question.

Actual cues to deception can be conceptualized as falling into three categories:

1. *deceptors:* behaviors more likely to occur during deceptive responses than during truthful ones;
2. *neutrals:* behaviors neither more nor less likely to occur during deceptive responses than during truthful ones; and
3. *sinceritors:* behaviors less likely to occur during deceptive responses than during truthful ones.

Similarly, perceived cues to deception can also be conceptualized as falling into one of three categories:

1. *discreditors:* behaviors more likely to be interpreted as cues to deception than as cues to truth;
2. *neurtrals:* behaviors neither more nor less likely to be interpreted as cues to deception than as cues to truth; and
3. *creditors:* behaviors less likely to be interpreted as cues to deception than as cues to truth.

Using this conceptual scheme, each cue of interest can be located in a 3 x 3 table which summarizes, for each cue, whether it is in fact a deceptor, a sinceritor, or a neutral cue, and whether it functions for perceivers as a discreditor, a creditor, or a neutral cue.

In the present study we examined actual and perceived verbal and paralinguistic cues to deception among 40 people (20 males and 20 females) who served both as liars (senders) and perceivers. As senders, subjects described either honestly or dishonestly other people that they knew. So that deception would vary independently of the particular affect being conveyed, senders described people they liked and people they disliked (honest descriptions), and they also described the person they liked, pretending to dislike him or her, and the person they disliked, pretending to like him or her (deceptive descriptions).

In choosing the particular cues to study, we were guided by considerations of the kinds of internal states that might covary with deception. For

example, if it is cognitively more challenging to tell a lie than to tell the truth, then liars might experience heightened cognitive processing. Liars might also experience anxiety or guilt during the proces of deceiving (see Kraut, 1980). Cues that might be associated with anxiety were fairly easy to generate. Previous research has shown that speech disturbances and various rate-related variables are sensitive to variations in anxiety (e.g., Goldman-Eisler, 1961a; Kasl & Mahl, 1965; Mahl, 1956); thus, in the present study, we measured nonfluences, um's and er's, rate, and rate change. It should be noted, however, that these kinds of behavior might also be affected by cognitive processing demands (see, for example, Goldman-Eisler, 1961b), or perhaps even by guilt.

If people experience guilt during deception, they might deal with it by being noncommittal and dissociating themselves from their responses, perhaps by making more neutral (rather than evaluative or extreme) statements, or by speaking in the third person, or by describing people (in the dishonest conditions) in global and undifferentiating ways. To measure the evaluativeness, personal involvement, and degree of differentiation in the deceptive and nondeceptive descriptions, we used a coding system developed and validated specifically for use in studying free verbal descriptions (Peevers & Second, 1973). We also developed a measure of extreme statements (e.g., use of superlatives).

The degree of differentiation in person descriptions has been shown to increase systematically with age; thus, this measure, too, might be sensitive to variations in cognitive demands. Finally, we also investigated the possibility that the use of the words "but" and "yet" in descriptions of others might also indicate a more cognitively complex mode of construing others, and hence might also vary with the cognitive demands of the task.

METHODS

Subjects

Subjects were 40 undergraduate summer school students (20 males and 20 females) recruited for a study of "person descriptions" and paid for their participation.

Procedure

Subjects were asked to take 1 minute to describe each of the following persons: someone they liked, someone they disliked, someone they felt ambivalent about, and someone they felt indifferent about. (Ambivalence was defined as strong feelings of both liking and disliking; indifference was

defined as no strong feelings of liking or disliking.) To elicit deception, subjects were also asked to describe the person they liked as if they really disliked him or her (pretend to dislike condition) and to describe the person they disliked as if they really liked him or her (pretend to like condition). These six descriptions were given in one of nine different orders (randomly assigned). Half of the subjects (10 males and 10 females, randomly assigned) described males; the others described females.

During the sessions, the experimenter remained behind a one-way mirror and videotaped the descriptions. Subjects were aware of this, and also knew that the experimenter was not informed of the sequence of their descriptions. They were urged to try to be very convincing in all of their descriptions.

From these descriptions, two one-hour videotapes were made. Each tape included all six descriptions from 20 of the senders (10 males and 10 females). Thus, each tape consisted of 120 descriptions. The order of appearance of the senders on these tapes were randomized. The middle 20 seconds of each description,[2] plus rating pauses, were included on the tapes. All subjects returned to judge one of these videotapes. Subjects always judged a videotape on which they did not appear. Subjects rated each segment on a 9-point scale of deception, with endpoints labeled "speaker is not very deceptive" (1) and "speaker is very deceptive" (9). (Subjects rated the descriptions on other scales, too, but those were not relevant to the present study.)[3]

The search for verbal and paralinguistic cues to deception using these perceivers and these stimulus materials is particularly appropriate for several reasons. First, previous research (DePaulo & Rosenthal, 1979) has shown that these perceivers performed substantially better than chance at detecting each other's deception from audiovisual cues (which include speech cues). Second, a subsequent investigation (DePaulo, Rosenthal, Green & Rosenkrantz, 1982) involving different subjects who judged these

[2]Only the middle 20 seconds were used to keep the rating task to a more manageable length. The available evidence suggests that this was not an unreasonably short segment. First, the average number of words spoken in these 20-second segments was 37.51. And second, perceivers showed substantial accuracy at detecting deception from these segments (DePaulo & Rosenthal, 1979).

[3]Subjects juding the tapes did know that two of the six descriptions made by each speaker would be deceptive. In this way, their task may have been somewhat simpler than the task faced by people trying to detect lies outside of the laboratory, where the base rates for the occurrence of deception are usually completely unknown. However, since the messages that subjects were asked to judge included several different types (ambivalent messags, indifferent messages, unambivalent truths, lies of liking and lies of disliking), subjects' task was more difficult (and more realistic) than that used in the typical deception paradigm in which subjects are asked merely to decide whether the speaker is lying or telling the truth.

descriptions from access to either face cues, tone of voice cues, verbal cues, audio cues, or audiovisual cues showed that, consistent with past research (see DePaulo et al., 1980), deception was most readily detected from any source of cues that included words (i.e., the verbal, audiovisual, and particularly the audio, conditions). Thus, there was reason to believe that there would be important verbal and paralinguistic cues to deception in these particular stimulus materials.

Verbal and Paralinguistic Cues

The verbal and paralinguistic cues measured in the present study are defined below.

1. Nonfluencies. Number of sentence changes, superfluous repetitions, stutterings, sentence incompletions, and other speech disturbances, as described and defined by Kasl and Mahl (1965). The number of nonfluencies in each description was divided by the total number of words in each description.

2. Um's and er's. Total number of um's, uh's, ah's, and er's, divided by the total number of words.

3. Rate. Since each excerpt that subjects judged was 20 seconds long, rate was readily assessed by simply counting the number of words per segment.

4. Number of sentences. The number of complete sentences in each segment. This measure would be useful if perceivers were sensitive not so much to the number of words per unit of time, but to a related higher-order variable, such as number of sentences. (Or, it would be useful if deceptive responses differed from truthful ones in this way.)

5. Rate change. The number of words in the second half of the description minus the number of words in the first half of the description. The rationale is that if senders telling lies start out having a difficult time constructing their lies, they might try to cover over the resulting laboriousness by quickening their rate of speech toward the end of their description.

The following 13 categories were borrowed or derived from the Person Concept Code (Peevers & Secord, 1973). The descriptions of each category are adapted from Peevers and Secord (1973, p. 122). The first four variables are levels of "descriptiveness." Descriptiveness refers to the amount of information given about a person as a unique individual. The number of

items at each level for each description was divided by the total number of descriptive items for that description.

6. Undifferentiating. The person was not differentiated from his or her environment, but was described in terms of possessions or social setting. (Examples: "Mary lives in a big house" and "John has a nice mother.")

7. Simple differentiating. The person was differentiated as an individual, but was described in terms of simple, superficial characteristics, global judgments, or his or her relationship to the perceiver. (Examples: "Mary is nice" and "John likes me.")

8. Differentiating. The person was described in terms of fairly specific personal characteristics, such as interests, abilities, beliefs, or temporary states or conditions. (Examples: "Mary is a good athlete" and "John is confused right now.")

9. Dispositional. The person was described in terms of traits which had implications for his or her behavior in a wide range of situations. (Example: "John is talkative.")

10. Cognitive complexity. This measure summarized the descriptiveness across the four different levels, weighing the cognitively complex levels more heavily than the cognitively simpler levels. More specifically, the formula was completed as follows: cognitive complexity = undifferentiating + (2 x simple differentiating) + (3 x differentiating) + (4 x dispositional). This measure would be useful if perceivers were sensitive primarily to the overall level of sophistication or differentiation in the descriptions (or if deceptive responses differed from truthful ones in this way).

The following three items describe the senders' degree of personal involvement in their descriptions. Personal involvement, according to Peevers and Secord (1973), refers to the frame of reference that individuals adopt in describing others; that is, the degree to which they involve themselves in what they say about others. The number of items at each level for each description was divided by the total number of descriptive items for that description.

11. Egocentric. The other person was described in subjective, self-oriented terms. Most descriptions in which "I" or "me" were used were of this type. (Example: "She gave me a cookie.")

12. Mutual. Another person was described in terms of his or her relationship to the perceiver. Descriptions of this type were often characterized by the use of "we" or "us." (Example: "We go bike-riding together.")

13. Other-oriented. No personal involvement was expressed by the perceiver. (Example: "He has blue eyes.")

14. Excess other. The degree to which the sender gave more other-oriented than egocentric characterizations, as defined by a difference score (other-oriented minus egocentric).

Items 15, 16, 17, and 18 assess the evaluative tenor of the descriptions. Each item of information in each description is coded as either positive, negative, or neutral according to whether the item describes desirable, undesirable, or evaluatively neutral characteristics. Details of the scoring are provided in the Peevers and Secord Person Concepts Code (see Peevers & Secord, 1973).

15. Positive. Number of positive items, divided by the total number of descriptive items.

16. Negative. Number of negative items, divided by the total number of descriptive items.

17. Neutral. Number of evaluatively neutral items, divided by the total number of descriptive items.

18. Excess positive. The degree to which senders said more positive than negative things in their descriptions, as defined by a difference score (positive minus negative).

19. Extremes. The person is described as extreme on a certain dimension. (Examples: She is extremely aggressive. He is very very cold. She is the most intelligent person I know.) Number of extremes was divided by the total number of words.

20. But's and yet's. Number of occurrences of the word "but" or "yet," divided by the total number of words.

For each cue, all descriptions were scored by a single judge. In order to assess the reliability of each measure, a second judge was recruited to score a subset of the descriptions (the six descriptions of six of the senders). The ratings made by both judges were always based on minimal cues—that is, exact transcripts. Product-moment correlations between the two judges' ratings were computed separately for each of the six types of descriptions. The interjudge reliabilities were: nonfluencies, .89; um's and er's, 1.00; rate, 1.00; number of sentences, .98; descriptiveness, .90; personal involvement, .97; evaluative tenor, .66; extremes, .98; and buts and yets, 1.00. On the whole, then, interjudge reliability seemed quite satisfactory.

RESULTS

Descriptions were the units of analysis for the computation of actual and perceived cues to deception. The descriptions analyzed were those in which the senders were telling the truth (the like and dislike descriptions) or lying (the "pretend to like" and "pretend to dislike" descriptions). Thus, all together there were 160 relevant descriptions (40 senders x 4 descriptions per sender). In all of our analyses, we examined separately descriptions in which the *expressed* affect was liking (i.e., the honest liking descriptions and the "pretend to like" descriptions) and those in which the expressed affect was disliking (i.e., the honest disliking descriptions and the "pretend to dislike" descriptions).

For each description, the following information was available: (1) the rate of occurrence of each cue; (2) whether the description actually was honest or deceptive; (3) whether the affect that the sender was attempting to send—that is, the expressed affect—was liking or disliking; (4) the sex of the sender; (5) the mean deception rating made by all judges; (6) the mean deception rating made by the male judges; and (7) the mean deception rating made by the female judges.

Actual Cues to Deception

Columns 1 and 3 of Table 1 show, for each cue, the correlation between (1) the rate of occurrence of that cue in each description, and (2) whether the description was honest or deceptive. In column 1, a positive correlation indicates that the cue occurred more often in descriptions in which senders wre *pretending to like* people they actually disliked than in honest descriptions of people the senders really did like. Analogously, a positive correlation in column 3 indicates that the cue occurred more often in "pretend to dislike" descriptions than in honest dislike descriptions. Thus, positive correlations always indicate that the cue occurred more frequently in the deceptive descriptions than in the truthful ones.

Column 1 shows that when senders were pretending to like people they really disliked, they made more affectively neutral comments and fewer positive comments than when they were honestly describing people they really did like. Also, the degree to which the number of positive comments exceeded the number of negative comments was not as great when the senders were lying as when they were telling the truth.

Column 3 shows that only one cue distinguished truth from deception when the expressed affect was disliking. Senders produced more speech nonfluencies when they were pretending to dislike people they really did like than when they honestly described people they really did dislike.

To compare the cues associated with lies of liking to the cues associated with lies of disliking, the correlations in column 1 were correlated with the correlations in column 3. (In this analysis, and in all similar analyses, the

TABLE 1
Verbal and Paralinguistic Correlates of Actual Deception and of Perceived Deception

	Expressed Affect			
	Like		*Dislike*	
Verbal or Paralinguistic Cue	*Actual Deception*	*Perceived Deception*	*Actual Deception*	*Perceived Deception*
1. Nonfluencies	.08	.19	.23‡	.24‡
2. Um's and er's	.09	.46**	.07	.25‡
3. Rate	.02	−.56***	−.09	−.33*
4. Number of sentences	−.02	−.21	−.05	−.07
5. Rate change	.08	−.03	.05	−.03
6. Undifferentiating	.08	.22‡	.02	.09
7. Simple differentiating	−.12	.01	.07	.11
8. Differentiating	.13	.05	−.01	−.03
9. Dispositional	−.02	−.15	−.07	−.09
10. Cognitive complexity	.03	−.13	−.08	−.13
11. Egocentric	−.16	−.29‡‡	.08	−.00
12. Other	.20	.28‡	−.13	−.08
13. Mutual	−.12	−.05	.11	.19
14. Excess other	.17	.29‡‡	−.10	−.04
15. Positive	−.30‡‡	−.31*	.16	.13
16. Negative	−.01	−.03	−.04	−.20
17. Neutral	.31*	.32*	−.04	.16
18. Excess positive	−.28‡	−.29‡‡	.09	.20
19. Extremes	−.14	.03	−.02	.20
20. But's and yet's	.00	−.05	−.11	−.02

Note: Using descriptions as the units of analysis, $N \cong 80$ (there is some variation due to missing data). Significance levels based on these *N*s are indicated by daggers. However, since each sender contributed two descriptions to each correlation, a more conservative estimate would involve basing the *df* on the number of senders. Significance levels based on this *N* (approximately 40) are indicated by asterisks.

‡$p \leq .05$, $df \cong 78$
‡‡$p \leq .01$, $df \cong 78$
*$p \leq .05$, $df \cong 38$
**$p \leq .01$, $df \cong 38$
***$p \leq .001$, $df \cong 38$

correlations were first transformed by Fisher's *Z*.) The resulting correlation was negative and significant, $r(18) = -.46$, $p < .05$. Thus, the cues that indicate that a person is feigning liking are not the same cues that indicate that a person is feigning disliking.

To examine sex differences in the ways that males and females lie, actual cues to deception were computed separately for male and female senders. The results are shown in Table 2. When expressing liking, males and females showed a marginally significant degree of similarity in the ways that they lied, $r\,(15) = .42$, $p = .09$ (correlation of column 1 with column 2). That is, the degree to which particular cues occurred more frequently when senders were pretending to like people (compared to when they really did like them) was somewhat similar for male and female senders. However, when the expressed affect was disliking, the comparable correlation was nonsignificant and slightly negative, $r\,(15) = -.25$ between columns 3 and 4. Thus, the degree to which these cues distinguished honest disliking from feigned disliking was not at all similar for male and female senders.

A closer examination of Table 2 indicates the specific ways in which males and females deceive differently. When expressing liking, women (compared to men) say fewer positive things—in both in an absolute sense and in comparison to negative things—when they are lying than when they are telling the truth. (Z for the difference between males and females = 2.48, $p = .01$, for positive, and 2.53, $p = .01$ for excess positive. Analyses were based on the two messages—truthful and deceptive—sent by each of the 20 male or female encoders). Similarly, when expressing disliking, females say fewer negative things when lying than when telling the truth ($Z = 2.01$, $p = .04$). Thus, when deceiving, females make less evaluatively extreme comments than they do when telling the truth. Women, compared to men, also say more neutral things when they are lying than when they are telling the truth, and this is true for both types of lies ($Z = 2.48$, $p = .01$ for expressed liking, and $Z = 2.69$, $p = .008$, for expressed disliking).

To test the overall power of this particular set of verbal and paralinguistic cues in distinguishing truth from deception, simulataneous regressions were computed. The predictor variables were the frequencies of the cues in each description[4] and the dependent variable was the actual deceptiveness of each description (i.e., either truthful or deceptive). This regression was computed separately for male and female senders and for expressed liking and

[4]The 20 cues were factor analyzed and z-scored before being entered into the regression equation. A nine-factor solution provided the best fit. The factors were: (1) nonfluencies, um's and er's, rate (negatively loaded), and number of sentences (negatively loaded); (2) other, excess other, and egocentric (negatively loaded); (3) dispositional, cognitive complexity, and simple differentiated (negatively loaded); (4) positive, excess positive, and negative (negatively loaded); (5) extremes, but's and yet's, and rate change; (6) neutral; (7) undifferentiated; (8) differentiated; and (9) mutual. When a factor was defined by more than one variable, the mean of those variables (reversed when necessary) was entered into the regression equations. *Df* may vary slightly across analyses because of missing data.

TABLE 2
Sex Differences in Verbal and Paralinguistic Correlates of Actual Deception

	Expressed Affect			
	Like		*Dislike*	
Verbal or Paralinguistic Cue	*Males*	*Females*	*Males*	*Females*
1. Nonfluencies	.09	.06	.28	.18
2. Um's and er's	−.00	.18	.10	.05
3. Rate	.07	−.05	−.03	−.18
4. Number of sentences	.06	−.10	.00	−.10
5. Rate change	.00	.18	−.12	.26
6. Undifferentiating	−.09	.26	.02	
7. Simple differentiating	−.08	−.15	−.09	.24
8. Differentiating	.16	.10	.11	−.14
9. Dispositional	−.05	.00	−.02	−.13
10. Cognitive complexity	.02	.04	.03	−.22
11. Egocentric	−.10	−.21	.09	.06
12. Other	.20	.19	−.18	−.06
13. Mutual	−.18		.16	
14. Excess other	.14	.20	−.14	−.05
15. Positive	−.06	−.57***	.19	.16
16. Negative	−.02		.18	−.28
17. Neutral	.07	.58***	−.36*	.25
18. Excess positive	−.05	−.57***	−.05	.28
19. Extremes	−.20	−.06	−.09	.07
20. But's and yet's	.00		−.16	

Note: A null entry indicates that the correlation could not be computed. For example, females expressing liking never said anything negative, whether lying or telling the truth.

expressed disliking. In these regressions, then, the 40 units of analysis were the two messages (truthful and deceptive) sent by each of the 20 male or female encoders. Results showed that these cues significantly differentiated truth from deception only for females expressing liking, $F(8,28) = 2.71$, $p = .02$, $R^2 = .44$. (For females expressing liking, $R^2 = .23$; for males expressing liking and disliking, $R^2 = .16$ and .32 respectively).

Perceived Cues to Deception

Columns 2 and 4 of Table 1 show, for each cue, the correlation between (1) the rate of occurrence of that cue in each description, and (2) the mean rating of deceptiveness of each description (i.e., perceived deceptiveness).

Column 2 shows that when senders were describing people they like or people they were pretending to like, they were perceived as especially deceptive when they used more um's and er's, talked more slowly, and described others in more undifferentiating terms. Infrequent use of egocentric references (both in an absolute sense and in comparison to "other" references) and frequent use of "other" references also made the descriptions appear more deceptive to the perceivers. Finally, less evaluatively extreme descriptions were also perceived as more deceptive, as evidenced by the negative correlations with "positive" and "excess positive" and the positive correlation with "neutral." In summary, when senders are encoding positive affect, they are seen as more deceptive when their descriptions are characterized by few positive and many neutral terms; fewer egocentric references and more other references; more undifferentiating terms, more um's and er's, and a slower rate.

Column 4 shows that three cues were related to perceptions of deceptiveness when the expressed affect was disliking. Consistent with the results for the "expressed liking" descriptions, descriptions were perceived as more deceptive when they were uttered more slowly and when they contained many um's and er's. For expressions of disliking, the occurrence of nonfluencies was also directly related to perceptions of deceptiveness.

To compare the cues used in perceptions of lies of liking to the cues used in perceptions of lies of disliking, the correlations in column 2 were correlated with the correlations in column 4. The resulting correlation was positive and significant, $r\ (18) = .46, p < .05$. Thus, perceivers use cues very similarly in making judgments about different kinds of lies.

To examine sex differences in the ways that males and females perceive deception, columns 2 and 4 (of Table 1) were computed separately for male and female perceivers. For expressed liking, the correlation between the 20 perceived deception correlations based on the male perceivers' judgments and corresponding correlations based on the female judgments was .85 ($p < .001$). For expressed disliking, the correlation was .52 ($p < .001$). Thus, males and females showed substantial agreement in the way that they used this set of cues in their judgments of deceptiveness.

For expressions of liking, the verbal and paralinguistic cues examined in this study accounted for a significant portion of the variance in judges' ratings of deceptiveness. This was true across all combinations of sender sex and perceiver sex. (For males and females judging male senders, $R^2 = .48$ and .50, respectively; for males and females judging female senders, $R^2 =$

.62 and .58, respectively. F's [8,28] ranged from 3.07 to 5.65, all p's $< .01$). For expressions of disliking, these cues did not account for a significant portion of the variance in perceived deceptiveness. (R^2 = .19, .35, .15, and .31, respectively, for males and females judging males, and males and females judging females.) The weak results for expressions of disliking, obtained in the analyses of both actual and perceived cues, may be a function of the relative infrequency of this type of deception. It seems plausible that people more often pretend to like disliked others than the reverse, although this has yet to be demonstrated empirically.

The Relationship Between Actual and Perceived Cues to Deception

Columns 1 and 3 of Table 1 indicate the degree to which each cue is *actually* associated with deception, while columns 2 and 4 indicate the degree to which each cue is *perceived* to be associated with deception. A precise, quantitative asssessment of the correspondence between actual and perceived cues can be obtained by correlating the "actual" column with the "perceived" column. For both expressed liking and expressed disliking, the correspondence was substantial, $r\,(18) = .66$, $p < .001$ for expressed liking and $r\,(18) = .69$, $p < .001$, for expressed disliking. Thus, the extent to which each of these various cues actually did distinguish between truth and deception was strongly related to the extent to which they were perceived as doing so.[5]

Table 3 shows the relationship between actual and perceived cues to deception separately for male and female perceivers judging male and female senders. Overall, the correspondence between actual and perceived cues was very similar for female and male perceivers, for same sex and opposite sex pairs, and for expressed liking and expressed disliking. Although the correspondence did tend to be higher for female senders than for male senders, this difference, too, failed to reach significance, $Z = 1.27$, $p = .20$, two-tailed.

[5]These correlations may appear to be inflated for several reasons. First, the list of cues includes three variables that were derived from other variables in the list—that is, cognitive complexity, excess other, and excess positive. However, when these derived variables were omitted, the correlations changed very little: $r\,(15)$ for expressed liking = .62, $p = .008$; for expressed disliking, $r\,(15) = .65$, $p = .004$. Also, when the nine factors (see footnote 4) were used as units, the relationships were still positive and highly significant, $r\,(7)$ for expressed liking = .71, $p = .03$; for expressed disliking, $r\,(7) = .87$, $p = .002$. Second, the correlations may seem to result from the fairly large number of variables that were not substantially associated with either actual deception or perceived deception. However, even when the actual and perceived correlations were small, they were usually in the same direction. For expressed liking, 14 of the 20 cues were correlated with actual and perceived deception in the same direction; for expressed disliking, 15 of the 20 cues shared the same signs.

TABLE 3
Relationship Between Actual Cues to Deception and Perceived Cues to Deception

	Expressed Affect			
	Like		*Dislike*	
Sex of sender	Male	Female	Male	Female
Sex of perceiver				
Male	.34	.61**	.45*	.59*
Female	.42	.86***	.33	.66**

*$p < .05$
**$p < .01$
***$p < .001$

DISCUSSION

Table 4 provides both a summary of our results and a heuristic model for conceptualizing simulateneously both actual and perceived cues to deception. The columns of Table 4 represent the three types of actual cues to deception (deceptors, neutrals, and sinceritors), while the rows represent the three types of perceived cues to deception (discreditors, neutrals, and creditors).

Some of the variables that we included largely on the basis of their hypothesized or demonstrated association with anxiety—that is, nonfluencies, um's and er's, and rate—were among the most powerful of our predictor variables. In expressions of disliking, speech nonfluencies served both as deceptors and discreditors. That is, they were interpreted as signs of deception and they actually *were* signs of deceptions. Um's and er's were directly associated with perceptions of deception both when liking and disliking were the expressed affects. These results are consistent with those reported in recent reviews of the literature (Kraut, 1980; Zuckerman et al., 1981). Thus, the hemming and hawing that our culture tends to associate with equivocation and deception does indeed appear to figure prominently in people's judgments about deception, and it also appears to characterize some of the kinds of lies that have been studied by psychologists.

Rate of speaking was not an actual cue to deception in this study, but it did serve as a creditor to perceivers, who rated fast talkers as significantly less likely to be lying than slow talkers. In research not dealing directly with deception, fast talkers have also been imbued with an array of desirable attributes; in a study of Miller, Maruyama, Beaber, and Valone (1976), speakers talking more quickly were perceived as more objective, intelligent, and knowledgeable. In two studies using computerized manipulations of

TABLE 4
Heuristic Model of Actual and Perceived Cues to Deception

Perceived Cues to Deception	*Actual Cues to Deception*		
	Deceptors	*Neutrals*	*Sinceritors*
Discreditors	Nonfluencies[a]	Um's and Er's	
		Undifferentiating[b]	
	Neutral[b]	Other[b]	
		Excess other[b]	
Neutrals		Number of Sentences	
		Rate Change	
		Simple Differentiating, Differentiating, Dispositional, and Cognitive Complexity	
		Mutual	
		Negative	
		Extremes	
		Buts and yets	
Creditors		Rate	Positive[b]
		Egocentric[b]	Excess Positive[b]

[a]This categorization describes the results for expressed disliking. For expressed liking, this cue was neutral with respect to both actual and perceived deception.

[b]This categorization describes the results for expressed liking. For expressed disliking, this cue was neutral with respect to both actual and perceived deception.

speech rate, curvilinear relationships emerged, such that deviations in either direction from the normal unmanipulated rate were judged as less benevolent (Smith, Brown, Strong, & Rencher, 1975), less persuasive, and more deceptive (Apple, Streeter, & Krauss, 1979). Perhaps perceivers use any plausible signs of anxiety—for example, speech disturbances, um's and er's, or unnaturally slow (or fast) rate—as cues to deception. Consistent with this interpretation, there is evidence that variations in rate affect attributions of nervousness in the same way that they affect attributions of deceit—that is, unusually slow (or fast) talkers are perceived as more deceptive and as more nervous (Apple et al., 1979)—and that speakers judged to be particularly nervous are also judged as especially likely to be lying (Kraut & Poe, 1980; Krauss et al., Note 1).

In the present study, we investigated the possibility that some of the cues might be curvilinearly associated with actual or perceived deception.[6] In most cases, these curvilinear correlations either were not significantly

[6]Curvilinearity was coded by z-scoring each cue separately, then taking the absolute value of the z-scores.

associated with actual or perceived deception, or they were significantly associated with the linear correlations (as in the case of extremely skewed distributions). The rate variable, however, was a notable exception. For expressed liking, the curvilinear component was substantially associated both with actual deception, $r(78) = .21$, $p = .06$, and with perceived deception, $r(78) = .25$, $p = .03$. (Descriptions were the units of analysis.) Moreover, the curvilinear and linear components of the rate variables were independent, $r(78) = -.06$. Thus, people expressing positive affect who are speaking too quickly or too slowly are likely to be lying, and they are also likely to be perceived as lying.

Although speech errors and variations in rate may be actual or perceived indicants of anxiety, they might also be linked to cognitive processing or to guilt. Other variables that have emerged in this study as discreditors, creditors, deceptors, or sinceritors strengthen the case for the role of anxiety or guilt as predictors of valid cues to deception. These variables—that is, the use of less evaluatively extreme descriptions, more neutral descriptions, fewer self-references, more other references, and more undifferentiated descriptive terms—all seem to be verbal devices that senders can use to dissociate themselves from the content of their messages. Senders feigning liking, for example, were not quite as positive in their descriptions as they were when expressing genuine liking; they also used more neutral items. Perceivers seemd to pick up on this: They rated these more noncommittal messages as more deceptive. When senders described others in very nonspecific, undifferentiating ways—for example, when they described their clothes, possessions, or jobs rather than their interests, abilities, or traits; and when they did not involve themselves personally in their descriptions (that is, when they used the third person rather than the first)—they were also perceived as being deceptive, even though these behaviors were not valid clues to deception.

Cues that signal dissocation, distancing, evasiveness, or a lack of involvement or commitment seem to play an important role in the perpetration (see also Kuiken, 1981) and detection of deceit. These kinds of cues could result from senders' guilt about lying, or, as Kuiken (1981) has suggested, from a more affectively neutral "apprehensive[ness] about affirming the validity of the contents of [one's] own statements" (p. 183). Finally, these verbal distancing devices, as well as the speech errors and rate fluctuations, might be indicative of the senders' insecurity about their ability to lie successfully. Although this suggestion is merely speculative, Kuiken's data (1981) are consistent with it: In a study in which self-esteem was experimentally manipulated, the low self-regard subjects used more "nonimmediate" (distancing) speech than the high self-regard subjects.

As in earlier studies (e.g., Kraut, 1978; Kraut & Poe, 1980), the perception of deception was much more powerfully predicted than was actual

deception. Kraut (1980), arguing from an evolutionary standpoint, has suggested that there may be no reliable cues to deception, since it would be disadvantageous for senders to have their deception attempts readily detected. While we certainly agree that no cue is likely to signal deception across all senders, perceivers, social settings, and types of lies (cf. DePaulo & Rosenthal, 1979), within any given situation in which perceivers are able to detect deception successfully, it seems reasonable to suppose that reliable cues to deception could be found. These cues might vary systematically with aspects of the deception situation. Perhaps the cues would be associated with deception in more complex ways than those we have studied in the present investigation.

Perceptions of deception might also be governed by intricate and interactive rules: For example, a certain behavior might influence judgments of deceptiveness only for certain kinds of perceivers and only when emitted by certain kinds of liars in certain kinds of contexts. However, research on human inference and decision making in other contexts suggests that judgmental processes often follow rather simple and straightforward rules (e.g., Slovic & Lichtenstein, 1971). Perhaps perceived cues to deceit could be most effectively identified by a knowledge of people's lay theories about deception. If, for example, perceivers believe that people who are lying are nervous and evasive, then their impressions of nervousness and evasiveness might be the most powerful predictions of their judgments about deception. The cues to perceived deceit, then, would be whatever cues give perceivers the impression that the speaker is nervous and evasive. Further, as Hocking and Leathers (1980) have suggested, the cues that are stereotypically associated with deceit may be the cues that deceivers try most carefully to monitor and control.

The present investigation, as well as others that have preceded it (e.g., Kraut & Poe, 1980), has documented considerable consistency in the use of cues by different kinds of perceivers. For example, Kraut & Poe (1980), in their study of deception detection among customs officials and laypersons, have found that very similar "search" rules are used by the officials and the laypersons, by the more and the less experienced officials, and by high and low self-monitors. In the present study there was substantial agreement between male and female perceivers in the cues they used in their judgments about deceit. Despite this similarity in the use of cues, previous research (DePaulo & Rosenthal, 1979; Littlepage & Pineault, 1979) has established a near-zero correlation between accuracy of detecting women's lies and accuracy at detecting men's. These findings led DePaulo and Rosenthal (1979) to speculate that perceivers may operate on the assumption that a single set of cues is consistently associated with deception, when in fact women's deceit is revealed in different ways than men's. The present results demonstrate that, at least in some ways, women do in fact lie differently

than men. Specifically, when deceiving, women, more than men, make comments that are less evaluatively extreme and more neutral.

Analyses of the relationship between lies of liking and lies of disliking revealed a similar pattern of consistency in the cues used in perceptions of deception, along with a significant degree of inconsistency in the cues that actually do signal deceit. Thus, perceivers seem to assume that the same kinds of tell-tale cues are given off by liars feigning disliking as by liars feigning liking, when in fact the relationship between cues to liking lies and cue to disliking lies is substantially negative.

The cues examined in this study on the whole provide only a hint as to what the most important verbal and nonverbal cues to actual and perceived deception might be. Half of the cues that we studied were not significantly associated with either perceived or actual deception. In a sense, the paucity of clear cues to actual deceit seems reasonable in light of the particular experimental context. Subjects were lying as part of their role in fulfilling the requirements of the experiment; hence, guilt about lying should have been minimal. Also, there were no explicit and compelling incentives for successful task performance, nor were there any disastrous consequences of failure; hence, anxiety should not have been a major variable either. Even the cognitive demands of fabricating a convincing lie should not have been particularly burdensome, since senders were allowed to take as much time as they wished to plan each description before actually saying it out loud. Yet, in spite of this generally nonthreatening context, senders were not able successfully to conceal their deceit. Subjects in this study were able to detect each other's deception (from audiovisual recordings) at an accuracy significantly above chance (DePaulo & Rosenthal, 1979); other judges (who had not served as senders in the study) were less accurate overall, but did somewhat better at detecting deception when they did have access to verbal cues than when they did not (DePaulo, et al., 1982). Because of the special characteristics of this study (e.g., low motivation to lie, minimal guilt), results should be generalized with caution to other types of deceptive transactions. The available evidence (Zuckerman et al., 1981) suggests that the present study might *under*estimate the degree to which verbal and nonverbal behaviors tip off deception, since more cues are reliably associated with deception when senders are highly motivated to lie successfully that when they are not highly motivated.

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