

NONVERBAL COMMUNICATION AND DECEPTION: DIFFERENCES IN DECEPTION CUES DUE TO GENDER AND COMMUNICATOR DOMINANCE

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This study investigates whether communicator characteristics (gender and communicator dominance) in nonverbal displays in truth-telling circumstances can be used to predict differences in deception cue leakage. Based on the arguments advanced by Hocking and Leathers in their 1980 article, it was argued that individuals who are more likely to exhibit a controllable behavior that is judged as stereotypical of liars during truth-telling would be more likely to suppress the behavior when lying. Male liars suppressed leg/foot movement and the use of illustrators when lying and increased facial adapting when lying (but only when prepared to lie). Contrary to expectations, there were no gender differences for laughter/smiling or for eye contact duration. Low dominant liars employed shorter latencies prior to lying and during a prepared lie than low dominant truth-tellers. Low dominant liars also provided briefer answers and engaged in less postural shifting throughout the entire interaction than low dominant truth-tellers. Results provided general support for the Hocking and Leathers perspective. Recommendations for future research are provided.

A SUBSTANTIAL body of literature explores issues related to deception accuracy and to the identification of specific cues which differentiate liars from truth-tellers.¹ Recently, Hocking and

Leathers presented a new perspective on nonverbal leakage of deception which subsumes and explains much of this

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¹Joyce Bauchner, David R. Brandt, and Gerald R. Miller, "The Truth/Deception Attribution: Effects of Varying Levels of Information Availability," in *Communication Yearbook 1*, ed. B. R. Ruben (New Brunswick, New Jersey: Transaction Press, 1977); David R. Brandt, Gerald R. Miller, John E. Hocking, "Familiarity and Lie Detection: A Replication and Extension," annual meeting of the Speech Communication Association, Anaheim, Nov. 1981; Mark E. Comadena, "Observer Accuracy in Detecting Deception in Intimate and Friendship Relationships," annual meeting of the International Communication Association, Boston, May 1982; Bella M. DePaulo and Robert Rosenthal, "Telling Lies," *Journal of Personality and Social Psychology*, 37 (1979), 1713-22; Paul Ekman and Wallace V. Friesen, "Nonverbal Leakage and Clues to Deception," *Psychiatry*, 32 (1969), 88-106; Paul Ekman and Wallace V. Friesen, "Hand Movements," *Journal of Communication*, 22 (1972), 353-74; Paul Ekman and Wallace V. Friesen, "Detecting Deception From the Body or Face," *Journal of Personality and Social Psychology*, 29 (1974), 288-98; Paul Ekman, Wallace V. Friesen, and K. R. Scherer, "Body Movement and Voice Pitch in Deceptive Interaction," *Semiotica*, 16 (1976), 23-27;

Ralph Exline et al., "Visual Interaction in Relation to Machiavellianism and an Unethical Act," in *Studies in Machiavellianism*, ed. Richard Christie and Florence L. Geis (New York, Academic Press, 1970); Paul J. Fay and Warren C. Middleton, "The Ability to Judge Truth-telling from the Voice Transmitted over a Public Address System," *Journal of General Psychology*, 24 (1941), 211-15; Robert S. Feldman, Linda Devin-Sheehan, and Vernon L. Allen, "Nonverbal Cues as Indicators of Verbal Dissembling," *American Education Research Journal*, 15 (1978), 217-31; Florence L. Geis and Tae H. Moon, "Machiavellianism and Deception," *Journal of Personality and Social Psychology*, 41 (1981), 766-75; Ronald A. Geizer, David L. Rarick, and Gary F. Soldow, "Deception and Judgment Accuracy: A Study in Person Perception," *Personality and Social Psychology Bulletin*, 3 (1977), 446-49; Lawrence A. Gustafson and Martin T. Orne, "The Effects of Perceived Role and Role Success on the Detection of Deception," *Journal of Applied Psychology*, 49 (1965), 412-17; John E. Hocking, Gerald R. Miller, and Norman E. Fontes, "Videotape in the Courtroom," *Trial*, 14 (1978), 52-55; John E. Hocking, Joyce Bauchner, Ed Kaminaki, and Gerald R. Miller, "Detecting Deception Communication From Verbal, Visual, and Paralinguistic Cues," *Human Communication Research*, 6 (1979), 33-46; John E. Hocking and Dale Leathers, "Nonverbal Indicators of Deception: A New Theoretical Perspective," *Communication Monographs*, 47 (1980), 119-31; Mark L. Knapp, Roderick P. Hart, and Harry S. Dennis, "An Exploration of

research.² There are two fundamental aspects to the Hocking and Leathers perspective.³ First, it is argued that when deceivers are motivated to avoid detection, they strive to avoid looking like liars by suppressing those behaviors which can be controlled and which are judged as stereotypical of liars. Specifically, the authors argue that foot movements, head movements, adaptors, leg movements, hand-to-face movements, illustrators, and overall body nervousness represent a class of behaviors that are linked to the liar stereotype and are behaviors which liars can successfully control.⁴ Some support is offered for this perspective: individuals engage in less foot movement when lying than when telling the truth, and there is a trend toward fewer head movements, hand-to-face movements and illustrators, and toward reduced overall body nervousness when lying than when telling the truth.⁵ Matarazzo, Wiens, Jackson, and Manaugh also provide support for this perspective.⁶ It is a

common belief that eye contact avoidance is a behavior exhibited by liars, and Matarazzo et al. report that when liars rehearse their lies they make a concerted effort to maintain eye contact.⁷ Similarly, Mehrabian reports that individuals engage in less leg/foot movement, less gesturing and less nodding when lying than when telling the truth.⁸ A second key aspect of the Hocking and Leathers argument is that some behaviors indicative of anxiety cannot be controlled and thus are increased during lying (i.e., vocal nervousness, stuttering, etc.).⁹

To be sure, the Hocking and Leathers perspective cannot entirely subsume and explain all results on deception leakage. Previous research on nonverbal leakage of deception yields inconsistent results for a number of behaviors, including leg/foot movement, eye contact duration, postural shifts, facial pleasantness and message duration.¹⁰ Further, predictions based on the Hocking and Leathers hypotheses are sometimes contradictory to predictions based on the Ekman and Friesen sending capacity hypothesis, which states that clues to deception are more likely to occur in channels low in sending capacity (leg/foot and/or hand movements) than in channels high in sending capacity (face).¹¹ Thus, support for the sending capacity hypothesis that leg/foot movement is increased during lying is incompatible with the Hocking

Deception as a Communication Construct," *Human Communication Research*, 1 (1974), 15-20; Robert E. Kraut, "Verbal and Nonverbal Cues in the Perception of Lying," *Personality and Social Psychology*, 36 (1978), 380-91; Glenn E. Littlepage and Martin A. Pincault, "Verbal, Facial and Paralinguistic Cues to the Deception of Truth and Lying," *Personality and Social Psychological Bulletin*, 5 (1979), 325-28; Joseph D. Matarazzo, Arthur N. Wiens, Russel H. Jackson, and Thomas S. Manaugh, "Interview Speech Behavior Under Conditions of Endogenously-present and Exogenously-induced Motivational States," *Journal of Clinical Psychology*, 26 (1970), 141-48; Charles C. McClintock and Raymond G. Hunt, "Nonverbal Indicators of Affect and Deception in an Interview Setting," *Journal of Applied Social Psychology*, 5 (1975), 54-67; Albert Mehrabian, *Nonverbal Communication* (Chicago: Aldine Atherton, 1972); H. Dan O'Hair, Michael J. Cody, and Margaret L. McLaughlin, "Prepared Lies, Spontaneous Lies, Machiavellianism, and Nonverbal Communication," *Human Communication Research*, 7 (1981), 325-39.

²Hocking and Leathers.

³Hocking and Leathers. We do not discuss here a class of variables which Hocking and Leathers judged as unrelated to deception.

⁴Hocking and Leathers.

⁵Hocking and Leathers.

⁶Matarazzo et al.

⁷Matarazzo et al.

⁸Mehrabian, *Nonverbal Communication*.

⁹Hocking and Leathers.

¹⁰Compare, for example, Mehrabian, *Nonverbal Communication*, Knapp, et al., and Kraut with Matarazzo et al., and compare Exline et al. and Knapp et al. with Matarazzo et al. and McClintock and Hunt. Inconsistencies exist for many variables. See reviews of deception research by Hocking, Miller and Fontes, and by Mark L. Knapp and Mark E. Comadena, "Telling It Like It Isn't: A Review of Theory and Research in Deceptive Communication," *Human Communication Research*, 5 (1979), 270-85.

¹¹Ekman and Friesen, "Nonverbal Leakage"; "Hand Movements"; "Detecting Deception"; Ekman, Friesen and Scherer

and Leathers argument.¹² Hocking and Leathers themselves note that when the liar's fear of consequences increases during lying more gestures of anxiety will be evidenced while the ability to control behaviors will be attenuated; and that the length of time required to maintain a lie may affect controllability as well.¹³

Liars may differ significantly in the ability to monitor their own behaviors effectively and may effect better control in some contexts than in others.¹⁴ For example, Fugita, Hogebe, and Wexley report that liars glance more frequently and maintain more eye contact with an "expert" interviewer than with an interviewer who is not described to the liars as a trained "expert."¹⁵ Subsequently, to derive support for the Hocking and Leathers' perspective, to explore its viability in comparison to the sending capacity hypothesis and to enhance the prediction of cue leakage, theorists need to explore carefully what behaviors are monitored and controlled by particular types of liars in particular types of lies.

We believe that a preliminary examination of the Hocking and Leathers perspective should begin with the role of communication characteristics in nonverbal communication during truth-telling. Specifically, we believe that if Hocking and Leathers are correct that a liar *suppresses* bodily movements when lying, then a significant reduction in behavior can only be evidenced if the liar engages in that behavior with some frequency during truth-telling. Obviously, if some individuals engage in little or no leg/foot movement during truth-telling,

then it cannot be argued that they "suppress" the behavior during lying. One logical extension, then, of the Hocking and Leathers perspective is to identify communicator characteristics that predict differences in "normal" truth-telling contexts and subsequently test hypotheses concerning the type of individual who would suppress the behavior when lying. Additionally, differences exist in how various types of individuals exhibit nervousness or anxiety, and thus the prediction of increases in specific anxiety indicators should be enhanced by knowing the type of individual who is lying.

In the present report two communicator characteristics, gender and dominance, are selected for study because previous literature links the variables to differences in nonverbal communication during interaction. Gender differences are considered important for two reasons.¹⁶ First, not only do males and

¹⁶Considerable evidence indicates that males and females differ in a wide range of behaviors, including leg/foot movement, eye contact, illustrators, sitting positions, smiling, the ability to interpret negative affect, etc. See Michael Argyle, Veronica Slater, Hilary Nicholson, Marilyn Williams, and Philip Burgess, "The Communication of Inferior and Superior Attitudes by Verbal and Nonverbal Signals," *British Journal of Social and Clinical Psychology*, 9 (1970), 222-31; Ross Buck, "Measuring Individual Differences in the Nonverbal Communication of Affect: The Slideviewing Paradigm," *Human Communication Research*, 6 (1979), 47-57; Ross Buck, Robert E. Miller, and William F. Caul, "Sex, Personality and Psychological Variables in the Communication of Emotion Via Facial Expression," *Journal of Personality and Social Psychology*, 30 (1974), 587-96; Starkey Duncan and Donald W. Fiske, *Face-to-Face Interactions: Research, Methods and Theory*, (Hillsdale, NJ: Lawrence Erlbaum Associates, 1977); Barbara Eakins and R. Gene Eakins, *Sex Differences in Human Communication* (Boston: Houghton-Mifflin, 1978). Nancy Henley, *Body Politics: Power, Sex and Nonverbal Communication* (Englewood Cliffs, NJ: Prentice-Hall, 1977); Paulette Peterson, "An Investigation of Sex Differences in Regard to Nonverbal Gestures, in *Siscom '75: Women's (and Men's) Communication*, ed. Barbara Eakins, R. Gene Eakins, and Barbara Lieb-Brihart (Falls Church, VA: Speech Communication Association, 1976); Robert Rosenthal, Judith A. Hall, M. Robin DiMatteo, Peter L. Rogers, and Dane Archer, *Sensitivity to Nonverbal Communication: The PONS Test* (Baltimore: The Johns Hopkins University Press, 1979); Robert Rosenthal and Bella M.

¹²Ekman and Friesen, "Nonverbal Leakage"; "Detecting Deception."

¹³Hocking and Leathers.

¹⁴Hocking and Leathers; Geizer, Rarick and Soldow.

¹⁵Stephen S. Fugita, Mark C. Hogebe, and Kenneth N. Wexley, "Perceptions of Deception: Perceived Expertise In Detecting Deception, Successfulness of Deception and Nonverbal Cues," *Personality and Social Psychology Bulletin*, 6 (1980), 637-43.

females differ in nonverbal communication during truth-telling but also in how anxiety is exhibited, thus providing predictions concerning the types of nervous gestures which might be displayed while lying.¹⁷ Second, our review of literature suggests that some of the inconsistencies in cue leakage may simply disappear when gender is taken into consideration. For example, evidence indicates that males engage in more leg/foot movement than females, and the majority of the Hocking and Leathers' respondents are male.¹⁸ On the other hand, the majority of Ekman and Friesen's respondents are female (nurses).¹⁹ Thus, Hocking and Leathers may find a decrease in leg/foot movements because male respondents engage in the behavior during truth-telling and suppress the behavior when lying in order to avoid looking like a stereotypical liar.²⁰ Alternatively, Ekman and Friesen may obtain a significant increase in leg/foot movement because the nurses employ little leg/foot movement when telling the truth and increased leg/foot movement when lying because of increased anxiety (or, as suggested by Hocking et al., as a reaction to the noxious stimulus materials presented—slides of burn victims).²¹ Because different sexes are used in these studies, the viability of one, or both of the hypotheses can only be explored if direct tests of sex differences are made.

DePaulo, "Sex Differences in Eavesdropping on Nonverbal Cues: *Journal of Personality and Social Psychology*, 37 (1979), 273-85.

¹⁷Eakins and Eakins; Eakins, Eakins and Liebrilhart.

¹⁸The observation that males engage in more leg/foot movement was documented in Peterson. Also see Eakins and Eakins; and Mehrabian, *Nonverbal Communication*. Hocking and Leathers originally sampled 19 male and 4 female students. Data for seven students were discarded, but the sex of these discarded students was not reported.

¹⁹Ekman and Friesen, "Detecting Deception."

²⁰Hocking and Leathers.

²¹Ekman and Friesen, "Detecting Deception"; Hocking, Bauchner, Kaminski, and Miller, p. 35.

Communicator dominance is generally associated with control of interactions and with verbal differences during interactions (i.e., latency duration and message duration).²² According to Hocking and Leathers, long latencies are indicative of anxiety and should therefore be evidenced when lying.²³ Previous research on both latency and message duration provide inconsistent results. In one study with no preparation or rehearsal of lying (i.e., "spontaneous" lying in response to a randomly flashing light), Kraut reports that liars engage in longer latencies when lying than when telling the truth.²⁴ However, O'Hair, Cody, and McLaughlin find individuals to engage in shorter latencies when they know they are to lie and are prepared to lie.²⁵ Several studies also indicate that when individuals are prepared to lie, messages of shorter duration are evidenced during lying than when telling the truth.²⁶ Consequently, because dominant communicators employ shorter latencies and longer messages in normal truth-telling interactions than low dominant communicators, we believe that differences for latency duration and message duration would be a function of both the level of dominance and the type of lie that is told (prepared vs. sponta-

²²Mehrabian, *Nonverbal Communication*; Albert Mehrabian, *Silent Messages* (Belmont, CA: Wadsworth, 1981); Mark L. Knapp, *Nonverbal Communication in Human Interaction* (New York: Holt, Rinehart and Winston, 1978).

²³Hocking and Leathers.

²⁴Kraut. Specifically, Kraut found that both the liar's perceptions of truthfulness and the observer's perceptions of truthfulness were correlated negatively with length of "hesitation," which was operationalized the same way we operationalized response latency (i.e., "the time from the end of the interviewer's question to the beginning of the actor's subjective answer divided by the length of the answer," [Kraut, p. 383]).

²⁵O'Hair, Cody and McLaughlin.

²⁶O'Hair, Cody and McLaughlin; Knapp, Hart and Dennis. An exception to this is Matarazzo, Wiens, Jackson and Manauagh, who found no difference in message duration between liars and truth-tellers.

neous).²⁷ For example, if low dominant communicators routinely employ longer latencies when telling the truth than dominant communicators and if liars exhibit short latencies during a prepared lie response, then a significant reduction in latency duration should be evidenced for low dominant liars. Thus, the central thesis of this paper is that predictions of specific cues leaked during deception can be based on the assessment of how different individuals typically behave in interactions. The variables of gender and communicator dominance are isolated to test this thesis.

HYPOTHESES

Gender Differences

This paper provides a secondary analysis of the O'Hair, Cody, and McLaughlin data because their data included an equal number of males and females and because they included a measure of dominance.²⁸ This data also offered two instances of lying (prepared vs. spontaneous) and two instances of telling the truth (pre-lie and post-lie).²⁹ One half of

the sample was assigned to the lying condition. Lying was induced by having respondents believe they were confederates in a study on "conversational analysis" and by instructing those respondents to lie by exaggerating their grade point averages on one question in a brief "self-disclosure" exercise (prepared lie).³⁰ After lying, a true confederate asked the respondents if the reported grade point averages were "averaged up a little," prompting liars to provide another lie (a spontaneous lie) in order to cover-up the prepared lie (and to cover-up their role as a "confederate"). The rest of their answers to questions were to be truthful. One half of the sample was assigned to the truth condition and told the truth on all questions including their grade point averages. Four interview segments were thus assessed for our analysis: pre-critical response (truthful responses by all subjects in both conditions which occurred prior to either of the critical questions), prepared-critical response (the response on which liars told a prepared lie and truth-tellers reported their actual grade point averages), spontaneous-critical response (the response on which liars told a spontaneous lie and truth-tellers denied exaggerations) and post-critical response (truthful responses by all subjects in both conditions which occurred at the end of the interview).

Hocking and Leathers did not make a distinction between prepared and spontaneous lies, but one would expect that liars would generally attempt to effect some control over behaviors in both types of lies.³¹ However, based on the Matarazzo et al. observation that allowing liars to rehearse lies afforded the liars the opportunity to control behaviors, we felt

²⁷Concerning dominance effects for latency and message duration, see Mehrabian, *Nonverbal Communication; Silent Messages*; Knapp, *Nonverbal Communication*.

²⁸O'Hair, Cody and McLaughlin. A measure of dominance was administered after the debriefing interview.

²⁹Both the two instances of lying and the two instances of truth-telling are considered advantageous for the following reasons. First, should the Hocking and Leathers hypotheses be supported for both types of lies then generalizability of results across lie type would be enhanced. Alternatively, if different results are obtained for the two types of lies then future research on cue leakage will have to take the type of lie into consideration when predicting cue leakage. Second, it is noted that individuals assigned to the lie condition may suppress postural shifts and answer questions with shorter latencies prior to actually lying because of the anticipation of lying (see O'Hair, Cody, and McLaughlin, and the related work by Gustafson and Orne). Further, there is some evidence that individuals may normally increase or decrease some behaviors (i.e., eye contact duration) as an interview progresses. Thus, both truthful responses which occur early in the interview and truthful responses which occur late in the interview are

required in order to assess "normal" truth-telling behaviors.

³⁰Details of the study are presented in the methods section of this paper. Also see O'Hair, Cody, and McLaughlin.

³¹Hocking and Leathers.

that liars would be better able to effect control over certain behaviors during the prepared lie than during the spontaneous lie.³² Further, while both lies should increase anxiety in comparison to truthful responses, we anticipated that the spontaneous lie would induce somewhat more anxiety than the prepared lie because of the more immediate threat to the image of the liar posed by the question implying that s/he had exaggerated. Thus, the ability to control behaviors should be somewhat better for the prepared response than for the spontaneous response, and the frequency of anxiety indicators should be somewhat higher for spontaneous responses than for prepared responses.

Behaviors judged as stereotypical of liars and considered controllable by Hocking and Leathers and by Matarazzo et al. included leg/foot movement, head movements, hand-to-face gestures, illustrators, overall body nervousness, and eye contact duration.³³ Of these behaviors, the variables of leg/foot movement, illustrators, and eye contact duration represent variables which differentiate between males and females during interactions.³⁴ Males typically engage in more leg/foot movement, more

illustrators, and less eye contact than females. While the general hypothesis is that both male and female liars will suppress leg/foot movement and illustrators when lying and maintain a sufficient amount of eye contact when lying in order not to appear to be a liar, the gender differences in interactions suggest that significant differences between truth-telling and lying responses would depend, in part, on gender. First, during truth-telling (for both pre-critical responses and post-critical responses) we anticipate male liars will engage in more leg/foot movement than female liars. Subsequently, if leg/foot movement is suppressed during lying, then males are expected to demonstrate a greater reduction in leg/foot movement than females. Further, male truth-tellers will engage in more leg/foot movement throughout the interview than female truth-tellers, and male truth-tellers will engage in more leg/foot movement when responding to the prepared and spontaneous critical questions than male liars. Thus,

H₁: There will be a significant three-way interaction effect for leg/foot movement such that female liars, female truth-tellers, and male truth-tellers will not differ in leg/foot movement across trials, while male liars will engage in less leg/foot movement during the prepared and spontaneous critical responses than during truth-telling and will engage in less leg/foot movement during the prepared and spontaneous critical responses than male truth-tellers.

Second, we anticipate that males will exhibit more illustrators when telling the truth than females.³⁵ Since an excessive amount of illustrating may be considered stereotypical of liars, the amount of illustrators exhibited by liars should be reduced when individuals lie.³⁶ Subsequently, male liars are more likely to demonstrate a significant reduction in

³²Matarazzo et al.

³³Hocking and Leathers; Matarazzo, Wiens, Jackson and Manaugh. In contrast to Hocking and Leathers, we do not consider adaptors to be under the control of liars.

³⁴Michael Argyle, *The Psychology of Interpersonal Behavior* (Baltimore: Penguin Books, 1967); Duncan and Fiske; Eakins and Eakins; Ralph Exline, David Grey, and Dorothy Schuette, "Visual Behavior in a Dyad as Affected by Interview Content and Sex of Respondent," *Journal of Personality and Social Psychology*, 1 (1965), 201-09; Ralph Exline and L. C. Winter, "Affective Relations and Mutual Glances in Dyad," in *Affect, Cognition and Personality*, ed. S. S. Thomkins and C. E. Izard (New York: Springer Press, 1965); Carolyn M. Holstein, Joel Goldstein, and Daryl Bem, "The Importance of Expressive Behavior, Involvement, Sex and Need-Approval in Inducing Liking," *Journal of Experimental Social Psychology*, 7 (1971), 534-44; William Libby, "Eye Contact and Direction of Looking As Stable Individual Differences," *Journal of Experimental Research in Personality*, 4 (1970), 303-12; Mehrabian, *Nonverbal Communication*; Peterson.

³⁵Eakins and Eakins; Peterson.

³⁶Hocking and Leathers argue that liars will suppress the use of illustrators when lying.

illustrators when lying, as compared to telling the truth, than females. Further, male truth-tellers are expected to engage in more illustrating when responding to the prepared and spontaneous critical questions than male liars. Thus,

H₂: There will be a significant three-way interaction effect for illustrators such that female liars, female truth-tellers, and male truth-tellers will not differ in illustrators across trials while male liars will engage in less illustrators during the prepared and spontaneous critical responses than during truth-telling and will engage in fewer illustrators during the prepared and spontaneous critical responses than male truth-tellers.

Matarazzo et al. reported that when individuals rehearsed their lies, they were able to maintain eye contact at the same rate as when telling the truth.³⁷ Hocking and Leathers, however, argue that variables associated with eye behavior (eye contact, eye flutter, etc.) are variables that may not differentiate between liars and truth-tellers.³⁸ Our review of literature both in deception and in gender differences suggest that males are less likely to maintain eye contact than females when lying. First, in the Hocking and Leathers study, which employed a primarily male sample, individuals engaged in less eye contact duration when lying than when telling the truth.³⁹ Similarly, Knapp, Hart, and Dennis employed a male sample (veterans) and found that individuals engaged in less eye contact when lying than when telling the truth.⁴⁰ Second, the work by Buck and by Rosenthal and DePaulo indicated that females are more likely to monitor visual cues associated with the face than aspects of the body when decoding nonverbal messages.⁴¹

Thus, if Hocking and Leathers are correct that monitoring a channel occurs prior to controlling it, we anticipate that females would be better able to control aspects of the face than males.⁴² Finally, females have been found to engage in more eye contact than males during interactions.⁴³ Subsequently, we anticipate that females will exhibit more eye contact than males when telling the truth and that female liars will exhibit similar rates of eye contact when truth-telling and when lying while male liars will reduce eye contact when lying. Thus, while female liars may evidence some reduction in eye contact when the ability to control behaviors is lowest (spontaneous lie), we generally expect female liars to maintain eye contact at rates similar to female truth-tellers while male liars will reduce eye contact when lying (in comparison to telling the truth) and that male liars will exhibit less eye contact during the prepared and spontaneous critical responses than male truth-tellers.

H₃: There will be a significant three-way interaction effect for eye contact duration such that female liars and female truth-tellers will not differ from each other across trials while male liars will employ less eye contact during the prepared and spontaneous critical responses than during truth-telling and will engage in less eye contact during the prepared and spontaneous critical responses than male truth-tellers.

Hocking and Leathers argue that some behaviors indicative of nervousness cannot be controlled by liars and are thus engaged in with increased frequency during lying.⁴⁴ We anticipate that male and female liars will display increased nervousness differently. In several studies, females were found to engage in

³⁷Matarazzo et al.

³⁸Hocking and Leathers.

³⁹Hocking and Leathers.

⁴⁰Knapp, Hart and Dennis.

⁴¹Buck; Buck, Miller and Caul; Rosenthal and De Paulo.

⁴²Hocking and Leathers.

⁴³Eakins and Eakins; Exline, Grey and Schuette; Exline and Winter; Holstein, Goldstein and Bem; Duncan and Fiske.

⁴⁴Hocking and Leathers.

more nervous smiling/laughter than males while males have been found to engage in increased bodily movements such as adaptors when feeling uncomfortable.⁴⁵ Therefore, we believe that female liars would engage in more smiling/laughter during lying than telling the truth while males would be more likely to engage in adaptors during lying than when telling the truth. Further, we anticipated that male truth-tellers would employ fewer adaptors during the prepared and spontaneous critical responses than male liars and that female truth-tellers would engage in less smiling/laughter during the prepared and spontaneous critical responses. Thus,

H₄: There will be a significant three-way interaction effect for smiling/laughter such that male truth-tellers, male liars, and female truth-tellers will not differ in smiling/laughter across trials while female liars will engage in more smiling/laughter during the prepared and spontaneous critical responses than when telling the truth and will engage in more smiling/laughter during the prepared and spontaneous critical responses than female truth-tellers.

H₅: There will be significant three-way interaction effect for adapting such that female truth-tellers, female liars, and male truth-tellers will not differ in adapting across trials while male liars will engage in more adapting during the prepared and spontaneous critical responses than during truth-telling and will engage in more adapting during the prepared and spontaneous critical responses than male truth-tellers.

Dominance

We anticipate that dominant communicators would have shorter latencies than low dominant communicators during truthful responses.⁴⁶ Liars should

evidence shorter latencies when prepared to lie, and because both dominant and low dominant communicators will be equally prepared to lie, we expect little difference between high and low dominant liars for the prepared critical response.⁴⁷ However, if low dominant liars exhibit longer latencies when telling the truth than dominant liars and all liars exhibit shorter latencies when lying preparedly, then we anticipate low dominant liars to evidence a greater reduction in response latency when providing a prepared lie than dominant liars. However, longer latencies are indicative of heightened anxiety and longer latencies should be evidenced when liars lie spontaneously. Kraut, for example, reports longer latencies when individuals lie spontaneously than when they tell the truth.⁴⁸ Yet, while both types of liars provide longer latencies during the spontaneous lie, the fact that dominant communicators typically exhibit shorter latencies than low dominant communicators suggests that dominant liars may produce shorter latencies than low dominant liars when lying spontaneously. That is, dominant liars will generally exhibit shorter latencies than low dominant liars when telling the truth and lying spontaneously while both types of liars will exhibit similar rates of latency when lying preparedly. Thus,

H₆: There will be a significant three-way interaction effect for response latency such that low dominant truth-tellers and dominant truth-tellers will not differ in response latency across trials while liars will engage in shorter latencies than truth-tellers during the prepared critical response, and dominant liars will exhibit shorter latencies when lying spontaneously than low dominant liars

We anticipate that dominant communicators will generally speak for longer

⁴⁵See Duncan and Fiske; Eakins and Eakins; Henley; Susan J. Beckman, "Sex Differences in Nonverbal Behavior," unpublished ms., Michigan State University, 1973. Jeanette Silveira, "Thoughts on the Politics of Touch," *Women's Press*, 1 (1972).

⁴⁶As noted earlier, dominance effects for latency and duration are referenced in Mehrabian, *Nonverbal Communication*; *Silent Messages*; Knapp.

⁴⁷O'Hair, Cody, and McLaughlin found that liars engaged in shorter latencies during the prepared-critical response than truth-tellers.

⁴⁸Kraut.

durations when responding to questions than low dominant communicators. For prepared lies, both Knapp, Hart, and Dennis and O'Hair, Cody, and McLaughlin report that liars speak for shorter durations when lying than do truth-tellers.⁴⁹ Consequently, if both high and low dominant communicators provide short responses when lying preparedly, we anticipate that dominant liars would evidence a greater reduction in message duration when lying than when telling the truth than low dominant liars. However, when liars lie spontaneously to deny the exaggeration, they are forced to encode quickly a message that, if they do not want to be detected, should be of sufficient length and plausibility to make the lie believable.⁵⁰ Thus, longer messages should be evidenced for spontaneous lies rather than for prepared lies. Further, if dominant communicators are more practiced in controlling verbal interactions and at providing lengthy answers to questions, it is likely that dominant liars would provide a longer message when lying spontaneously than low dominant liars. Thus, low dominant liars are expected to produce shorter answers when telling the truth than dominant liars, dominant liars are expected to produce longer messages when lying spontaneously than low dominant liars, and both types of liars are expected to produce the shortest message when lying preparedly. Thus,

H₇: There will be a significant three-way interaction effect for message duration such that dominant truth-tellers will engage in longer messages than low dominant truth-tellers, dominant liars will engage in longer messages than low dominant liars when telling the truth, while dominant liars will engage in longer messages than low dominant liars when lying spontaneously.

⁴⁹Knapp, Hart, and Dennis; O'Hair, Cody, and McLaughlin.

⁵⁰Kraut, for example, found that the liars' judgements of the truthfulness of a spontaneously produced answer correlated positively with message length.

Obviously, there could be additional differences due to dominance, but we feel there are insufficient grounds on which to make specific predictions. For example, some studies indicate that dominant speakers maintain less eye contact than low dominant speakers while others have suggested that dominant speakers engage in constant eye contact.⁵¹ Consequently, no hypotheses were advanced for those variables for which there are mixed results.

METHODS

Sample

Participants were 36 male and 36 female undergraduate students enrolled at a large southwestern university. Sixty-eight of these students completed the Norton measure of communicator style (34 male and 34 female),⁵² from which the dominant communicator subscale was used to measure dominance. (The five-item dominance measure has an alpha of .84.) The descriptive statistics were as follows: mean, 3.103; mode, 3.6; standard deviation, .899; median, 3.267; range, 3.6.

Procedures

Participants were recruited ostensibly for a study in "conversational analysis" and were told that the purpose of the study was to "see what kinds of topics people introduce in interactions between strangers."⁵³ All participants were given a list of 20 questions and were told that each participant and the partner with

⁵¹See for example, Knapp, p. 228

⁵²Robert W. Norton, "Foundations of a Communicator Style Construct," *Human Communication Research*, 4 (1978), 99-112; Barbara M. Montgomery and Robert W. Norton, "Sex Differences and Similarities in Communicator Style," *Communication Monographs*, 48 (1981), 121-32.

⁵³For complete details of procedures, methods and materials see O'Hair, Cody and McLaughlin; Henry Dan O'Hair, "Machiavellianism, Types of Lies and Nonverbal Communication," Master's Thesis, Texas Tech University 1979.

whom s/he was randomly paired would ask the questions of each other in order to start the conversation. All participants were led to believe the conversations would last one-half hour, and all participants were told that they could ask the questions in any order they desired. Truth-tellers were told to tell the truth on all twenty questions. Liars, however, were asked to be confederates in the study and were asked by the experimenter to lie on one question (i.e., to exaggerate their GPA's in order to "see the effects this would have on the topics your partner introduces"). The inflated GPA's were, on the average, rounded up .9 units. All participants were actually paired with one of three female or two male confederates who asked the twenty questions in a prearranged order. The prepared critical question "What's your current grade point average?" was placed in the middle as question number 10, and immediately after the prepared critical question the true confederate asked the spontaneous critical question: "Is that a rough estimate, averaged up a little?" Participants' bodies were filmed from a ceiling camera and their faces were filmed through a one-way mirror so that the participants would not be aware of the presence of the cameras although earlier they were informed that they would be videotaped.

Upon completion of the interview the experimenter debriefed the participants about the intent and purpose of the interview and questioned each participant as to the truthfulness of his/her responses. All participants in the deceptive condition indicated that they had told the truth throughout the interview except for the prepared and spontaneous critical questions. Participants in the truthful condition maintained that they had been honest on each question.

Responses for four pre-critical questions were coded ("Do you have a favorite author?" "What is your major?"

"What is your hometown?" "Do you belong to any organizations off campus?"), and the nonverbal gestures for these responses were averaged to form the pre-critical behaviors analyzed below. Responses for the prepared and spontaneous critical questions were also coded. Responses for four post-critical questions were coded ("What are your career goals?" "Do you play any sports?" "What is your father's [mother's] occupation?" and "Do you have a religion?") and averaged to form the post-critical behaviors. The behaviors coded were message duration, response latency, eye contact rate, affirmative head nodding rate, laugh/smile rate, postural shift rate, body adaptor rate, facial adaptor rate, illustrator rate, and leg/foot movement rate.⁵⁴ Each variable was measured to one-tenth of a second accuracy and intercoder reliabilities were established well beyond a .85 limit.⁵⁵ Because total interaction time (message duration plus response latency) varied considerably from one question to another, all variables except message duration and

⁵⁴Operational definitions of the variables are as follows: *message duration* was the length of time of a respondent's answer; *response latency* was the time between the last syllable of the confederate's question and the first syllable of the respondent's answer; *eye contact duration* was the length of time a respondent engaged in direct eye contact with the confederate when answering; *affirmative head nodding* was the length of time a respondent spent moving his/her head up and down when responding; *laughter/smiling* was the length of time the respondent engaged in laughter, smiling, or facial pleasantness when responding; *postural shift* was the length of time spent in changing the angle of the spine during the respondent's answer; *body adaptor* was the length of time spent in any touching of the body (trunk, legs, and feet) by the respondent's hands or arms (such as rubbing, scratching, pinching, picking—stationary chin holding was not included as an adaptor); *facial adaptor* was the length of time spent in any touching, pinching, picking, or rubbing of the face (above the shoulder blades and including the neck); *illustrator* was the length of time a respondent's arms and/or hands were used in an effort to illustrate what was being said; and *leg/foot movement* was the length of time spent in any movement by the respondent's leg or foot.

⁵⁵See O'Hair, Cody, and McLaughlin.

TABLE 1
MEAN LENGTH OF TIME ENGAGED IN LEG/FOOT MOVEMENT BY MALE
AND FEMALE LIARS AND TRUTH-TELLERS

Interview Segment:	Deception/ Male	Deception/ Female	Means:		Means:
			Truth/ Male	Truth/ Female	
Pre-critical	.0547	.0397	.1206	.0244	.0601
Prepared-critical	.0000	.0206	.0918	.0075	.0301
Spontaneous-critical	.1041	.0028	.1094	.0694	.0704
Post-critical	.1349	.0363	.1181	.0658	.0883
Mean:	.0734	.0248	.1100	.0418	.0622

Interview Segment:	Deception/ Male	Standard Deviations Deception/ Female	Truth/ Male	Truth/ Female
Prepared-critical	.0000	.0600	.2468	.0300
Spontaneous-critical	.2625	.0118	.2576	.1223
Post-critical	.1956	.0575	.2380	.0700

response latency were computed as rates (length of time engaged in behavior/total interaction time) in order to understand the behaviors.

RESULTS

To test the hypotheses, 2 (lie and truth) \times 2 (high and low dominant communicator) \times 2 (male and female) \times 4 (trials) repeated measures ANOVAs were computed for each variable.⁵⁶ The first hypothesis predicted that males would generally engage in more leg/foot movement than females and that male liars would suppress leg/foot movement when lying more than female liars. A significant Trials \times Deception \times Gender interaction effect was obtained ($F = 2.84$, $df = 3/180$, $p = .039$). Table 1 presents the means and standard deviations by trials, deception condition, and gender. As anticipated, male liars engaged in significantly less leg/foot

movement during the prepared-critical response ($\bar{X} = .000$) than during the pre-critical ($\bar{X} = .055$; $t = 2.75$, $df = 16$, $p = .014$) and post-critical responses ($\bar{X} = .135$; $t = 2.84$, $p = .012$), but not during the spontaneous critical response ($\bar{X} = .104$; $t = 1.64$, $p = .12$). For male truth-tellers, there were no significant differences in leg/foot movement across the four segments of the interview. Male truth-tellers engaged in marginally more leg/foot movement ($\bar{X} = .092$) than male liars ($\bar{X} = .000$) during the prepared critical response ($p < .10$), but not during the spontaneous critical response. Contrary to expectations, however, female truth-tellers employed more leg/foot movement during the post critical response ($\bar{X} = .066$) than during the pre-critical responses ($\bar{X} = .024$, $t = 2.17$, $p = .046$), and generally employed more leg/foot movement during the last half of the interview ($\bar{X} = .068$) than during the first half of the interview ($\bar{X} = .016$). These results indicate the female truth-tellers engaged in more leg/foot movement as the interview progressed, possi-

⁵⁶For these analyses program P2V was used in *Bio-medical Computer Programs, P-Series*, ed. W. J. Dixon and M. B. Brown (Berkeley: University of California Press, 1979).

bly because of increased confidence due to the fact that their role as respondent would soon finish. This trend was replicated by male liars (who employed significantly more leg/foot movement during the post-critical response [$\bar{X} = .135$] than during either the precritical response [$\bar{X} = .055$, $t = 2.75$, $p = .014$] or the spontaneous critical response [$\bar{X} = .000$, $t = 2.84$, $p = 0.12$]), but was not replicated by either male truth-tellers or female liars.

In contrast to male liars, there were no significant differences in leg/foot movement for female liars between the prepared critical response and any other segments of the interview. Instead, female liars engaged in less leg/foot movement when responding to the spontaneous critical question ($\bar{X} = .003$) than during the pre-critical ($\bar{X} = .040$, $t = 3.33$, $p = .004$) or the post-critical question ($\bar{X} = .036$, $t = 2.90$, $p = .01$). These results suggest that (1) male liars suppressed leg/foot movement during the prepared critical response; (2) female liars suppressed leg/foot movement during the spontaneous critical response; and (3) female truth-tellers and male

liars engaged in more leg/foot movement as the interview progressed over time. Hypothesis one was supported although the additional differences for female truth-tellers and the significant reduction by female liars during the spontaneous critical question were not anticipated.

The analysis for illustrator rate yielded a significant Trials \times Deception \times Gender interaction effect ($F = 4.45$, $df = 3/180$, $p = .005$). Table 2 presents the means and standard deviations. As expected, male liars displayed significantly less illustrating during the prepared critical response ($\bar{X} = .000$) than during the pre-critical ($\bar{X} = .017$, $t = 3.37$, $p = .004$), spontaneous critical ($\bar{X} = .075$, $t = 2.48$, $p = .025$) and post-critical responses ($\bar{X} = .012$, $t = 2.11$, $p = .05$). Male truth-tellers were somewhat more likely to engage in illustrating during the prepared critical response ($\bar{X} = .002$) than male liars ($\bar{X} = .000$) although not significantly more so. Female liars exhibited a pattern similar to male liars, but results were significant for only one of the comparisons. Female liars engaged in less illustrating dur-

TABLE 2
MEAN LENGTH OF TIME IN USE OF ILLUSTRATORS BY MALE AND FEMALE LIARS AND TRUTH-TELLERS

Interview Segment:	Means:				
	Deception/ Male	Deception/ Female	Truth/ Male	Truth/ Female	Means:
Pre-critical	.0171	.0167	.0071	.0200	.0151
Prepared-critical	.0000	.0000	.0024	.0000	.0006
Spontaneous-critical	.0753	.0339	.0465	.1156	.0666
Post-critical	.0124	.0461	.0241	.0312	.0287
Mean:	.0262	.0242	.0200	.0417	.0287

Interview Segment:	Standard Deviations			
	Deception/ Male	Deception/ Female	Truth/ Male	Truth/ Female
Pre-critical	.0208	.0373	.0110	.0529
Prepared-critical	.0000	.0000	.0097	.0000
Spontaneous-critical	.1252	.0771	.1117	.1742
Post-critical	.0241	.0646	.0384	.0463

ing the prepared critical response ($\bar{X} = .000$) than during the post-critical response ($\bar{X} = .046$, $t = 3.03$, $p = .008$), but less of a difference was exhibited during the pre-critical ($\bar{X} = .017$; $t = 1.90$, $p = .08$) and spontaneous critical responses ($\bar{X} = .034$, $t = 1.87$, $p = .08$). Thus, as expected, male liars exhibited a greater reduction in illustrating during the prepared critical response than did female liars.

For truth-tellers different trends were obtained for males and females. Male truth-tellers engaged in more illustrating during the post-critical ($\bar{X} = .024$) than during either the pre-critical ($\bar{X} = .007$, $t = 2.08$, $p = .05$) or the prepared-critical responses ($\bar{X} = .002$, $t = 2.72$, $p = .01$), indicating a tendency for male truth-tellers to increase the use of illustrating during the course of the interaction (for example, much more illustrating took place in the last half of the interview [$\bar{X} = .035$] than during the first half of the interview [$\bar{X} = .005$]). This trend was not replicated by either male liars ($\bar{X}s = .017$ and $.012$ for pre- and post-critical responses, $t = .54$, $p = .60$), female truth-tellers ($\bar{X}s = .020$, $.031$, $t = .93$, $p = .37$) or female liars ($\bar{X}s = .017$, $.046$, $t = 1.71$, $p = .10$). However, female truth-tellers employed significantly more illustrators during the spontaneous critical response ($\bar{X} = .160$) than during the pre-critical ($\bar{X} = .020$, $t = 2.26$, $p = .04$) and prepared critical responses ($\bar{X} = .000$, $t = 2.26$, $df = 16$, $p = .018$) but not in comparison with the post-critical response ($\bar{X} = .031$, $t = 1.87$, $p = .08$). These results indicate that (1) male liars suppressed the use of illustrators during the prepared critical response in comparison to other responses (and did so more than female liars); (2) male truth-tellers increased the use of illustrators during the course of the interaction; and (3) female truth-tellers increased the use of illustrators during the spontaneous critical response in comparison to other

responses. Partial support was thus obtained for hypothesis two although the differences evidenced by truth-tellers was not anticipated.

The third hypothesis pertained to gender differences for eye contact duration. There were no significant differences for either gender ($F = .05$, $df = 1/60$, $p = .83$), deception condition ($F = .23$, $df = 1/60$, $p = .63$) or trials ($F = .90$, $df = 3/180$, $p = .44$); nor were there any significant interactions. Hypothesis three was rejected. There were no significant differences for laughter/smiling. Hypothesis four was rejected.

There were no significant results for body adaptors; however there was a significant $\text{Trials} \times \text{Deception} \times \text{Gender}$ interaction effect for facial adaptors ($F = 3.60$, $df = 3/180$, $p = .014$). Table 3 presents the means and standard deviations. We anticipated that male liars would increase facial adapting during lying. A significant $\text{Deception} \times \text{Gender}$ interaction was obtained only for the prepared critical response ($F = 4.12$, $df = 1/60$, $p = .05$), indicating that male liars employed more facial adaptors during the prepared critical response ($\bar{X} = .142$) than male truth-tellers ($\bar{X} = .057$). Thus, partial support was obtained for the fifth hypothesis. However, we also had anticipated that male liars would exhibit increased adaptors when lying than when telling the truth, and this expectation was not supported. That is, while male liars exhibited significantly more facial adaptors during the prepared critical response than male truth-tellers, male liars did not exhibit a significant increase during the prepared critical response when compared to the amount exhibited when male liars told the truth. In part, this failure was due to the fact that male liars engaged in somewhat (although not significantly) more facial adapting during the pre-critical truthful responses ($\bar{X} = .062$) than male truth-tellers ($\bar{X} = .005$). Thus, because the male liars already engaged in the

TABLE
MEAN LENGTH OF TIME ENGAGED IN FACIAL ADAPTORS BY MALE AND FEMALE
LIARS AND TRUTH-TELLERS

Interview Segment:	Means:				
	Deception, Male	Deception, Female	Truth, Male	Truth, Female	Means
Pre-critical	.0618	.0072	.0047	.0306	.0257
Prepared-critical	.1418	.0000	.0000	.0575	.0490
Spontaneous-critical	.0288	.0533	.0106	.0156	.0276
Post-critical	.0465	.0189	.0459	.0269	.0344
Mean:	.0697	.0199	.0153	.0327	.0342

Interview Segment:	Standard Deviations			
	Deception, Male	Deception, Female	Truth, Male	Truth, Female
Pre-critical	.2297	.0160	.0137	.1090
Prepared-critical	.3379	.0000	.0000	.2300
Spontaneous-critical	.1188	.1479	.0437	.0457
Post-critical	.1235	.0852	.1422	.0692

behavior when telling the truth, possibly because of being moderately nervous about their role, the probability of obtaining a significant increase between pre- and prepared critical responses was attenuated. Nonetheless, male liars engaged in significantly more facial adaptors than male truth-tellers during the prepared critical responses.

The sixth hypothesis pertained to differences in response latency by high and low dominant truth-tellers and liars. In the analysis of response latency duration a significant Trials \times Deception \times Dominance interaction effect was obtained ($F = 4.52$, $df = 3/180$, $p = .004$). Table 4 presents the means and standard deviations. As expected, both dominant liars and low dominant liars did not differ in response latency during the prepared critical response than during other responses. Dominant liars engaged in shorter latencies during the prepared critical response ($\bar{X} = .80$) than during the pre-critical ($\bar{X} = 1.38$; $t = 4.73$, $df = 16$, $p = .001$), spontaneous critical ($\bar{X} = 1.197$, $t = 2.04$, $df = 16$, $p = .06$)

and post-critical responses ($\bar{X} = 1.43$; $t = 5.07$, $df = 16$, $p = .001$). Similarly, low dominant liars engaged in shorter latencies during the prepared critical response ($\bar{X} = .75$) than during the pre-critical ($\bar{X} = 1.33$, $t = 5.78$, $df = 16$, $p = .001$), spontaneous critical ($\bar{X} = 1.76$, $t = 3.08$, $df = 16$, $p = .007$) and post-critical responses ($\bar{X} = 1.23$, $t = 6.97$, $df = 16$, $p = .001$). However, we had anticipated that low dominant liars would evidence longer latencies during truth-telling responses than dominant liars and that low dominant liars would thus evidence a greater reduction in latency duration when lying than dominant liars. This result was not obtained: dominant liars did not differ from low dominant liars during either the pre-critical ($\bar{X}s = 1.38$, 1.33 for dominant and low dominant liars, $t = .33$) or post-critical responses ($\bar{X}s = 1.44$, 1.23 , $t = 1.24$). To some extent this failure was due to the fact that low dominant liars engaged in relatively short latencies prior to actually lying. As O'Hair, Cody, and McLaughlin noted,

TABLE 4
MEANS AND STANDARD DEVIATIONS FOR LATENCY BY TRIALS, DOMINANT STYLE, AND DECEPTION

Interview Segment:	Deception/ Dominant	Deception/ Low Dominant	Means:		Means:
			Truth/ Dominant	Truth/ Low Dominant	
Pre-critical	1.3803	1.3296	1.5829	1.9271	1.5411
Prepared-critical	.8002	.7548	1.2857	1.4189	1.0531
Spontaneous-critical	1.1966	1.7647	2.2513	1.4700	1.6865
Post-critical	1.4359	1.2318	1.4884	1.5149	1.4132
Mean:	1.2032	1.2702	1.6521	1.5827	1.4234

Interview Segment:	Deception/ Dominant	Standard Deviations		
		Deception/ Low Dominant	Truth/ Dominant	Truth/ Low Dominant
Pre-critical	.3889	.4630	.4332	1.0987
Prepared-critical	.3880	.2867	.7503	.8284
Spontaneous-critical	.8145	1.3609	1.6112	.6536
Post-critical	.5663	.3277	.6588	.6536

it is possible that an individual's role as a confederate in a study on deception may influence some behaviors prior to lying as the individual anticipates lying.⁵⁷ In the present analysis, it appeared that the anticipation of lying did influence latency durations during the pre-critical phase, and that low dominant liars were more strongly influenced by the anticipation than dominant liars: low dominant liars engaged in significantly shorter latencies ($\bar{X} = 1.33$) than low dominant truth-tellers ($\bar{X} = 1.93$, $t = 3.83$, $p = .01$) during the pre-critical responses while dominant liars ($\bar{X} = 1.38$) did not differ from dominant truth-tellers ($\bar{X} = 1.58$, $t = 1.39$). Thus, the failure to obtain a stronger trend towards reduced latencies during lying by low dominant liars than dominant liars was due, in part, to the fact that when low dominant liars were assigned the task of lying they became more responsive (shorter latencies) than low dominant truth-tellers during that part of the interaction where they anticipated the prepared critical question.

We had also anticipated that dominant liars would engage in significantly shorter latencies during the spontaneous critical response than low dominant liars. Dominant liars did engage in shorter latencies ($\bar{X} = 1.20$) than low dominant liars ($\bar{X} = 1.76$), but this comparison only approached significance ($t = 1.43$, $p < .05$). However, dominant liars engaged in shorter latencies during the spontaneous critical response than dominant truth-tellers ($\bar{X} = 2.25$, $t = 2.34$, $p < .05$). Hypothesis six was thus rejected. Instead, our results indicate that (1) both dominant and low dominant liars evidenced a reduction in latency duration when lying preparedly; (2) low dominant liars exhibited shorter latencies during the pre-critical response than dominant liars; and (3) dominant liars engaged in shorter latencies during the spontaneous critical response than dominant truth-tellers.

The seventh hypothesis pertained to differences in message duration for high and low dominant communicators. Only the Deception \times Dominance interaction effect was significant ($F = 4.29$, $df =$

⁵⁷O'Hair, Cody and McLaughlin.

1/60, $p = .043$). Low dominant liars engaged in significantly shorter messages throughout the interaction ($\bar{X} = 2.64$) than low dominant truth-tellers ($\bar{X} = 4.51, t = 2.84, df = 33, p = .05$) or dominant liars ($\bar{X} = 4.19, t = 2.06, df = 33, p = .048$) and marginally shorter than dominant truth-tellers ($\bar{X} = 3.66, t = 1.77, df = 30, p = .09$). Apparently, when low dominant communicators were assigned the task of lying, they generally answered all questions with shorter answers than either dominant liars or low dominant truth-tellers, possibly in the hopes of relinquishing their role as liar and confederate sooner.

Although not predicted, there was a significant Deception \times Dominance interaction effect for postural shifts ($F = 6.35, df = 1/60, p = 0.14$). Low dominant truth-tellers engaged in more postural shifts ($\bar{X} = .036$) than low dominant liars ($\bar{X} = .004, t = 2.19, df = 33, p = .05$) while there was no difference between dominant liars ($\bar{X} = .027$) and dominant truth-tellers ($\bar{X} = .005, p = .17$). Low dominant truth-tellers also engaged in significantly more postural shifts than dominant truth-tellers ($t = 2.39, df = 31, p = .045$). Thus, if low dominant communicators normally engage in more postural shifts when telling the truth than dominant communicators, then these results indicate that when low dominant communicators are assigned the task of lying that they sit in more rigid positions and shift less in those positions during the interaction than their low dominant counterparts.

DISCUSSION

Our purpose in this paper was to extend the Hocking and Leathers hypotheses by arguing that the prediction of specific cues leaked by liars can be achieved based on the assessment of how different individuals typically behave in

interactions.³ General, but qualified support was obtained for our approach. Males engaged in more leg/foot movement than females, especially as the interview progressed over time, and male truth-tellers increased the use of illustrators as the interview progressed over time. As expected, male liars suppressed both of these behaviors when engaged in the prepared-critical response. We also expected that gender could be related to differences in how nervousness would be evidenced and male liars were found to employ more facial adaptors during the prepared-critical response than male truth-tellers. Differences were also obtained for dominance. Low dominant liars engaged in shorter latencies prior to lying and during the prepared-critical response than low dominant truth-tellers. Further, our results indicate that low dominant liars engaged in shorter answers and sat in more rigid sitting positions throughout the entire interaction than their low dominant truth-telling counterparts, possibly because they desired to relinquish their role as liar and confederate sooner and because they felt less comfortable in their role as liar/confederate.

Thus, the results of the present study suggest that knowing the sex and level of dominance of the potential liar should help in detecting deception and provide guidelines as to where observers should look for cues. For example, these results suggest that low dominant males are likely to engage in little illustrating, little leg/foot movement, more facial adapting (at the time of lying), longer latencies (when lying spontaneously), and fewer postural shifts and shorter messages throughout the interview than other types of liars.

Several predictions were not supported, and several results were obtained that were not anticipated. First, both

³Hocking and Leathers.

male liars and female truth-tellers engaged in more leg/foot movement as the interaction progressed. Because previous literature linked increases in leg/foot movement to feelings of confidence, our results suggest that male liars and female truth-tellers evidenced greater confidence as they became aware of the fact that their role as the respondent was to end.⁵⁹ Further, female liars engaged in less leg/foot movement during the spontaneous-critical response than during truthful responses. This outcome may be explained in one of two ways. First, the reduced leg/foot movement may have occurred because female liars attempted to control the behavior when lying and effected better control during the spontaneous-critical response than during the prepared-critical response, thus providing some support for the Hocking and Leathers perspective. Alternatively, it may be the case that female liars reduced leg/foot movement during the response about which they felt the least amount of confidence, and because the accusation of exaggeration implies that their response to the prepared-critical question was not believed, female liars may have felt the least confident when lying spontaneously. Female truth-tellers increased the used of illustrators during the spontaneous-critical question and this may have been due to the fact that females desired to be convincing when explaining that they had indeed told the truth and thus employed more illustrators in order to be more convincing.

We had also expected gender differences for eye contact duration and for smiling/laughter. However, it is likely that, as Hocking and Leathers noted, eye contact duration simply may not differentiate between lying and telling the

truth.⁶⁰ Further, given that eye contact duration is influenced by how close partners sit, feelings of threat or embarrassment, how much eye contact the interviewer employs, etc., it is likely that too many variables besides deception influenced the amount of eye contact duration thus limiting the variable's usefulness as an indicator of deception.⁶¹ Finally, we had anticipated that female liars would engage in more nervous laughter/smiling than male liars during lying. Several reasons may have offset this trend. First, the enactment of their role as confederate may have prompted the female liars to be serious and to be highly concerned with their image and role. Thus, female liars did not engage in more smiling or laughter during the prepared-critical response. Second, because few cues were leaked by liars during the spontaneous-critical response, it may be the case that all respondents were surprised and were nervous when accused of exaggeration. Thus, female liars did not engage in more frequent laughter/smiling than other respondents.

Nonetheless, our results support the Hocking and Leathers perspective and our extension of it: communicator characteristics play a role both in normal truth-telling behaviors and in the leakage of deception cues. Further, because a direct test of sex differences was made, it would appear that the Hocking and Leathers hypothesis concerning leg/foot movement was supported while the Ekman and Friesen hypotheses were not.⁶² Obviously, further research needs to continue to explore the role of communicator characteristics in deception in order to enhance the prediction of cue leakage. Future research may find that

⁵⁹Harper, Wiens, and Matarazzo; Albert Mehrabian and Marilyn Williams, "Nonverbal Concomitants of Perceived and Intended Persuasiveness," *Journal of Personality and Social Psychology*, 13 (1969), 37-58.

⁶⁰Hocking and Leathers.

⁶¹Hocking and Leathers.

⁶²Hocking and Leathers; Ekman and Friesen, "Nonverbal Leakage."

other variables besides the ones selected for study here are affected by gender during truth-telling and are differentially leaked by the sexes during lying. Future research is needed to assess the role of additional communicator characteristics.

In addition, future research is needed to assess different types of lies. In both the present analysis and in the O'Hair, Cody, and McLaughlin analysis there were apparently few cues which differentiated liars and truth-tellers during the spontaneous-critical response.⁶³ In part, this failure may be due to the fact that all individuals were surprised by the spontaneous accusation of exaggeration and behaved similarly when responding. Further, the responses to the spontaneous-critical question were generally brief ($\bar{X} = 3.75$), which limited our ability to assess either differences in controlling behaviors or to assess increased nervousness by liars. Therefore, future research should have liars lie on questions which require a longer, more narrative answer in order to better differentiate liars from truth-tellers. According to Hocking and Leathers, longer lies should result in limiting controllability and possibly provide more observable instances of nervous gestures than the relatively brief lies examined in this report.⁶⁴ Further, a longer period of

lying would also provide the type of data required to assess leakage in the messages: variables such as vagueness, concreteness, and uncertainty.⁶⁵

A final limitation must be stipulated. While the findings of the present study basically support the notion that liars attempted to control behaviors associated with the stereotype of the liar, no direct evidence for such an explanation was provided here; nor was any provided by Hocking and Leathers.⁶⁶ To date, only the Matarazzo, et al. study conducted post-experimental interviews with liars to uncover whether intentional efforts at controlling behaviors were executed.⁶⁷ Future research should pursue such interviews in order to validate whether liars intend to behave in ways our hypotheses claim they intend to behave. Alternatively, some of our results may be explained on the basis of decreased confidence during lying and not on the basis of a conscious effort to control behaviors. Thus, future research needs to assess the role of additional communicator characteristics and additional types of lies and assess more directly liars' purported intentions in order both to enhance cue prediction and to establish evidence for one explanatory principle of cue leakage over rival explanations.

⁶³O'Hair, Cody, and McLaughlin.

⁶⁴Hocking and Leathers.

⁶⁵Knapp, Hart, and Dennis; Kraut.

⁶⁶Hocking and Leathers.

⁶⁷Matarazzo et al.

