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MACHIAVELLIANISM, POWER, AND COMMUNICATION
BEHAVIOR IN THE CREATIVE ALTERNATIVE GAME.

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GRADUATE COLLEGE

MACHIAVELLIANISM, POWER, AND COMMUNICATION BEHAVIOR IN THE CREATIVE ALTERNATIVE GAME

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

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By

VINCENT HAZLETON, JR.

1977

MACHIAVELLIANISM, POWER,

AND COMMUNICATION BEHAVIOR

IN THE CREATIVE ALTERNATIVE GAME

A DISSERTATION

APPROVED FOR THE DEPARTMENT OF COMMUNICATION

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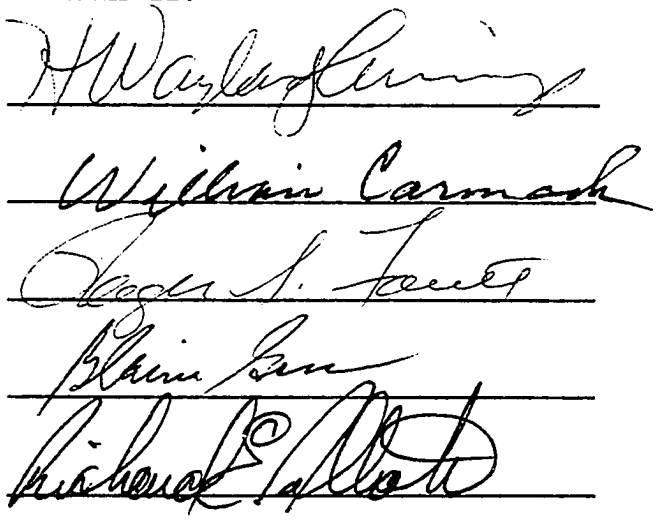

DISSERTATION COMMITTEE

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I will try and remember everyone else with Christmas Cards.

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MACHIAVELLIANISM, POWER, AND COMMUNICATION BEHAVIOR IN THE CREATIVE ALTERNATIVE GAME

INTRODUCTION

Collusion is a social behavior for which opportunity to communicate has been found to be a necessary but not sufficient cause (Seibold and Steinfat, 1975). This previous research conceptualized communication simply. Subjects were given the opportunity to communicate verbally in a face-to-face setting or they were allowed no opportunities for communication. Verbal behavior constitutes a manifest element of communication. Verbal behavior can be conceptualized as a complex set of variables which may be found to be related to personality, situational variables, or other social behaviors. This conceptualization of communication in terms of verbal behavior leads to the observation that perhaps variances in verbal behavior may account for the previous findings. That is, there may be observable differences in the verbal behaviors found in collusive and non-collusive relationships.

This dissertation reports an investigation of certain manifest aspects of verbal behavior encoded by human subjects engaged in collusive and non-collusive relationships. The personality variable, Machiavellianism, and the situational variable, power, are also considered. The dissertation is organized into four chapters. The first

chapter presents both a rationale for the study, and the hypotheses to which the study is addressed. The second chapter consists of a discussion of the procedures utilized in gathering and analyzing the data. The third chapter presents the results of the data analysis. The final chapter consists of a discussion of the results and significance of the study, and suggestions for future research.

CHAPTER I

RATIONALE AND HYPOTHESES

Three assumptions which are common to communication scholars underly this investigation. The first assumption is that communication behavior may be a cause of other social behavior. The second assumption is that each or both of two classes of variables may be antecedent to communication behavior: (1) The actor's personality may affect the communication; (2) the situation may affect the communication; or (3) the actor's personality and the situation may interact to affect communication. A third assumption is that verbal behavior constitutes primary evidence for communication and is the most abundant and accessible data concerning communication.

These assumptions lead to a consideration of four class variables whose interrelationship is the focus of this investigation: (1) Social behavior for which communication is a causal variable; (2) personality variables; (3) situational variables; and (4) verbal behavior. Specifically, the purpose is to investigate the relationship between the social behavior of collusion; a situational variable of power; a personality variable, Machiavellianism; and two aspects of verbal behavior, syntax and utterances.

To explicate the rationale for this study, the remainder of this chapter is divided into five sections. In the first section, the research strategy which underlies the investigation is presented. In the second section, the social behavior variable of collusion is discussed. In section three, the situational variable of power is examined. Section four presents the relevant literature for the personality variable, Machiavellianism, and a hypothetical relationship between Machiavellianism and power is suggested. In the final section, relationships between collusion, power, Machiavellianism, and the verbal behavior variables of syntax and utterances are hypothesized.

Research Strategy

In its most general sense, the purpose of this study is to increase understanding of communication by studying the relationship of certain manifest aspects to other meaningful social variables. One way to generate information concerning the relationship between situational variables, personality variables, and communication is to study their interrelationships within an experimental task for which communication has previously been identified as an essential determinant of some other social behavior such as collusion.

A simple logic provides the rationale underlying the need for a task in which communication is an essential ingredient to some social outcome. As will be seen in the next section of this study, a kind of social outcome is collusion. If communication is always present when collusion occurs, but communication also can occur without collusion, then communication is a necessary but not sufficient condition for collusion. Communication, however, is a complex phenomena; it is defined

diversely (Dance and Larson, 1976). It may be that communication has been defined so broadly that we reach a false conclusion about its "necessary but not sufficient" nature. Without "sufficiency," a statement of "necessary" conditions is less precise. If we had a more precise definition, or if we viewed communication as a complex of several variables, we may find more useful knowledge claims can be made. Greater precision in the defining of communication might allow us to make statements about what is necessary, what is sufficient, and what is necessary and sufficient.

It is just such a concern that motivates this study. In order to do this, this chapter will discuss the relationship between the social behavior of collusion and communication. Power will be described, then, as a situational variable found in communication; a discussion of Machiavellianism as a personality variable related both to power and communication will follow. The chapter will close with a discussion of the interrelationships between collusion, power, Machiavellianism, and certain verbal behaviors characteristic of communication. Hypothesized relationships will be part of this last section, and submitted for testing in a concern for better understanding of the role of communication and human behavior.

Collusion

Collusion occurs when two or more individuals enter into a mutually beneficial agreement at the expense of some third individual or social institution (Steinfatt, 1973). Kickbacks and bribes are the most obvious examples of collusion. A more abstract example is the victimless crime such as prostitution or drug trafficking, where the

expense to society is hypothetical. However, because collusion in most cases is considered immoral or illegal, it is a form of social behavior which is generally not readily accessible to study.

When a form of social behavior is not directly accessible, game simulations provide a realistic alternative for study (Goffman, 1969). Game-simulations are of particular interest because they allow the study of particular classes of behavior and their relationships to variables of theoretic interest under controlled laboratory conditions.

Steinfatt (1973) has developed a game simulation which provides an opportunity to study collusive behavior. Called the "Creative Alternative Game", the simulation is a two person, non-zero sum game. The game is defined in the following manner:

> A CA (creative alternative) game may be defined as a matrix in which (1) there exists only one rational choice for one player (o) but a mixed motive situation for the other player (p); (2) the choice of his best move by o must result in only one rational choice remaining for p; (3) the payoff to both players from this semi-forced solution must be equal; (4) the total pay-off to both players must be a maximum when both fail to choose their rational alternative (for p this means the alternative shot is rational when o chooses rationally) and should be on the order of twice the total payoff available from the mutual rational choice cell; and (5) neither player has fate control over the other if the other chooses his rational alternative (Steinfatt and Miller, 1974, 62).

The choices in the game matrix provide a simple operationalization of the concept of collusion (see Figure 1). By agreeing to split either points or a reward associated with maximizing the points of a single player and choosing the BD alternative, the players (p and o) may maximize their own rewards at the expense of a third party (the house or experimenter). All other combinations of choices are non-collusive. Previous research using the Creative Alternative Game (Steinfatt, 1973;

Steinfatt, Seibold, and Frye, 1974) indicates that opportunity for communication is a necessary cause of collusion. Seibold and Steinfatt (1974, 7) observe that "the CA game yields maximum rewards to both players only if they agree to side payments, and to form a joint strategy which has no rational basis; and would not be possible without communication."

Another characteristic of the Creative Alternative Game is that it allows the investigation of the effects of power differences upon behavior. The concept of power and its operationalization in the Creative Alternative Game is discussed in the following section.

Power

Power theorists (i.e. March, 1955; Schur, 1969, Harsanyi, 1962) generally define power in terms of the ability to influence the outcome of particular interactions. To understand the concept of "power" as a situational variable, it is necessary to understand how situations, in general may differ.

At present there is no viable theory of situations. In the field of communication, Hewes, Haight, and Szalay (1976) have noted the need to develop a theoretic language to describe situations. While the study of human ecology (Barker, 1960, 1963, 1965, 1968) is still in its infancy, it is possible to identify some superordinate categories for a taxonomy of situations. Categories of situational variables considered relevant to communication events are discussed below.

The communication "situation" is considered to be a cognitive state, constructed by communicators. A considerable body of evidence for this proposition has been amassed by the proponents of attribution

theory (e.g. Heider, 1958; Bem, 1972; Kelley, 1972). Given this perspective, the researcher must then reconstruct situations by identifying the information used by participants as they construct communication situations.

Two categories of information appear to influence the construction of communication situations. The first category of information consists of the prior cognitions of the participants. This information is not readily accessible to the observer of a situation, but is inferred from data such as attitudinal pre-tests, personality measures, and demographics. Because of its personal inferential nature, this type of information is labeled idiosyncratic. The second type of information is provided by the physical, unalterable elements of the communication setting. This type of information which is readily accessible to both actor and observer is labeled contextual.

There are three categories of idiosyncratic information: cultural, sociological, and psychological (Miller and Steinberg, 1975). Cultural information consists of knowledge of beliefs, habits, practices, and communication of large geographically defined groups.

Sociological knowledge is similar to cultural knowledge. However, they differ in several significant ways. Social groups tend to have fewer members than cultures. Membership in social groups is likely to be voluntary. Membership in social groups is not restricted by cultural identification.

There are two types of psychological information: dispositional and cognitive. Personality attributes are dispositional information. Cognitive information consists of the actors unique knowledge of the behavioral characteristics of particular others and prior events.

There are two categories of contextual information. The first category of contextual information is identified as physical/adaptive. Background noise is an example of this type of information. In the presence of background noise, the participants in a communication event speak more loudly.

The second type of contextual information is labeled symbolic. Symbolic information is a function of the interaction between the physical environment and the actor's store of idiosyncratic information.

Power and status may be used as examples of symbolic information. A priest's collar (physical cue) provides information concerning status only if the actor is familiar with the practices of the social groups known as Catholics and Episcopalians. Guns in the hands of conquistadores intially were not symbols of power for the natives of Peru and Mexico who had no cognitive information about their effect.

In the game setting, differences in power are a function of the alternatives made available through the game matrix. When points determine rewards and a player's choice has an impact on the points received by the other player, points take on psychological significance and function as tokens of power.

Following Harsanyi (1962), the relative power relationship between players p and o in the Creative Alternative Game is determined by the probability of p or o getting the other to adopt the Creative strategy (the BD choice) when the other has initially adopted the rational strategy (the A or C choice). An analysis of the game matrix (see Figure 1) reveals that the maximum possible payoff during any game round is 4 for o and 20 for p. However, p's success is dependent upon the behavior

FIGURE 1

Creative Alternative Game Matrix

		Player P: C	Player P: D
Player O	A	P = 4 O = 4	P = -8 O = 4
	B	P = 4 O = 0	P = 20 O = -2

of o. Because p may derive maximum benefits from the BD strategy, it is reasonable to assume that the probability of o persuading p to engage in this strategy is greater than the probability of p persuading o. Therefore, o is considered to be more powerful than p.

Both power and communication are variables which have been linked to the personality variable of Machiavellianism. The relevant literature of Machiavellianism is reviewed next.

Machiavellianism

Machiavellianism (Christie and Geis, 1968, 1970) is a personality construct related to willingness to manipulate others. It is a variable of increasing interest to communication theorists because its literary and historical roots lie in communication situations. Christie initially hypothesized the Machiavellian to be characterized by: (1) a relative lack of effect in interpersonal relationships; (2) a lack of concern with conventional morality; (3) a lack of gross psychopathology; and (4) low ideological commitment. Subsequent research indicates the high Machiavellian is amoral, resistant to social pressure, cognitively oriented, distrusts people, initiates structure and controls interaction when possible and is relatively unaffected by his own beliefs. The low Machiavellian, on the other hand, believes in an implicit morality, is susceptible to social pressure, is influenced by implicit assumptions about social behavior, is distracted by the process of interaction, and is affected by his own behaviors.

Machiavellianism was identified as a personality variable of interest for three reasons. First, it is one of the few personality constructs whose theoretic literature takes into account the situation.

Second, a considerable body of literature exists which suggests that Machiavellianism is related to communication behavior. Third, previous research (Geis, 1970b) links Machiavellianism to position power in a game setting.

Important for the present study is the Christie and Geis (1970) contention that there is an interaction between the dispositional characteristics of Machiavellianism and the environmental-psychological situation. The three situational variables identified by Christie and Geis are: (1) Face-to-Face Interaction--where subjects are physically present and have the opportunity to observe and communicate with each other; (2) Latitude for Improvisation--where the structure of the task is sufficiently ambiguous to allow subjects to improvise both the content and timing of responses; (3) Irrelevant Affect--where there is the potential for personal and emotional involvement with either people or issues.

The three variables were identified through an analysis of 50 experimental studies involving bargaining games or attitude change. In 13 of the 13 studies where face-to-face interaction, latitude for improvisation, and the potential for irrelevant affect were judged present, results indicated that "high Machs won more, were persuaded less, persuaded others more, or behaved as predicted significantly (Christie and Geis, 1970, p. 289)" when compared to low Machiavellians. In the 11 studies where none of the situational variables were present, no significant differences in behavior were observed. In 7 of the twelve studies in which two of the variables were present, high Machiavellians performed differently from low Machiavellians. Finally, differences were observed

in only 5 of the 13 studies in which one of the three variables was present.

Several subsequent studies have tended to provide additional support for the Machiavellianism-situation interaction. Burgoon (1971) tested the relationship between Machiavellianism and success in a loosely structured communication course and a highly structured public speaking course. Also, as expected, there was no significant relationship between Machiavellianism and success in the highly structured course.

Young and Hurt (1973) observed a significant interaction between Machiavellianism and channel of communication for attitude change. There were no differences in attitude change between high and low Machiavellians in audio-tape and written channel conditions, while in a live channel condition, high Machiavellians exhibited less attitude change than low Machiavellians. Another interesting finding of Young and Hurt was that high Machiavellians preferred the live channel condition, while low Machiavellians were equally satisfied by all conditions.

Hazleton (1976) found that high and low Machiavellians perceived the credibility of a non-interpersonal source similarly, while they perceived the credibility of an interpersonal source type differently.

Taken together, these studies provide compelling evidence for the Machiavellianism-situation interaction. It is most interesting to note that the conditions under which differences in behavior as a function of Machiavellianism have been observed are almost precisely the conditions which Mischel (1973) suggests are necessary for personality differences to be manifested in behavior. A summary of the effects of the personality-situation interaction for Machiavellianism is provided in

Figure 2 (adapted from Christie and Geis, 1970, p. 351).

The second reason that Machiavellianism was selected as a variable of interest is that a considerable body of research exists linking Machiavellianism to communication. This link is seen in studies of deception, manipulation, and bargaining.

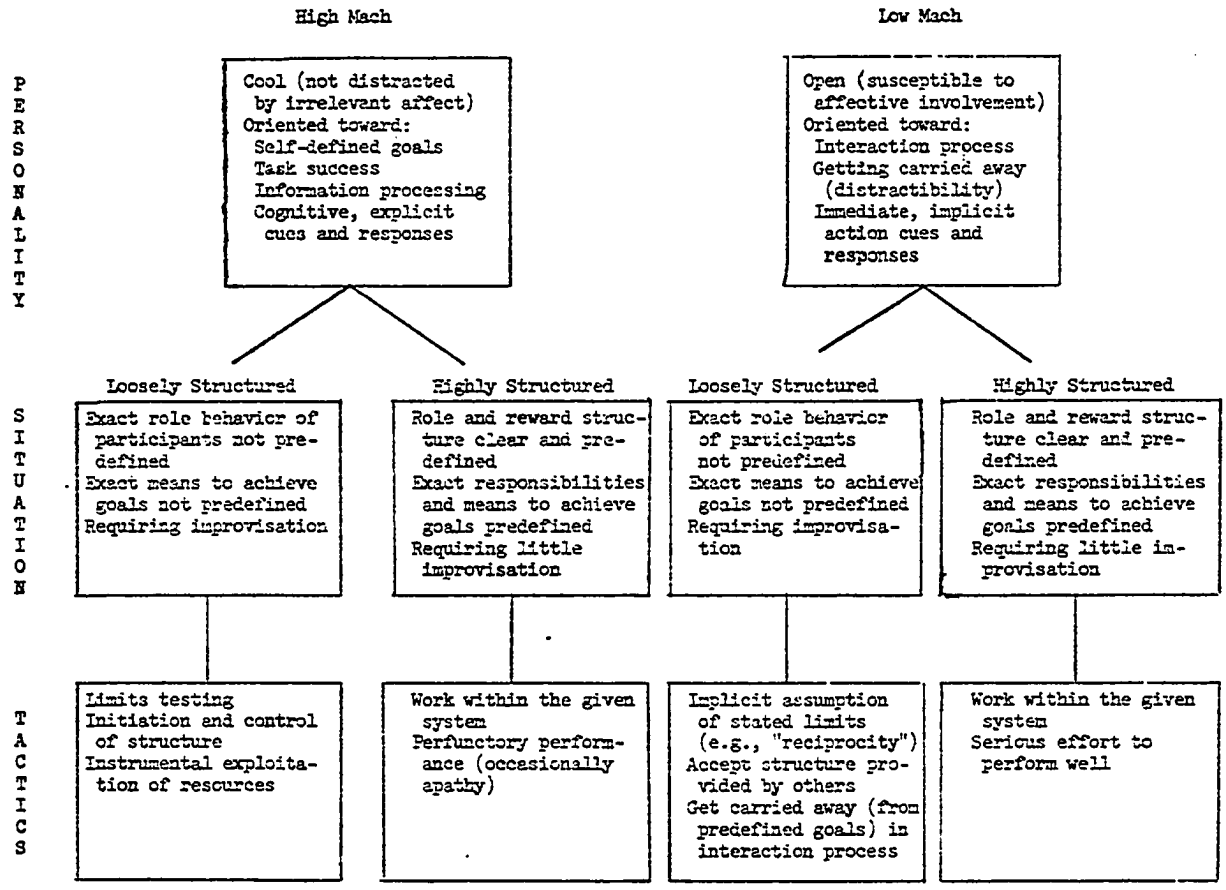
Exline, Thibaut, Hickey, and Gumpert (1970) studied the relationship of Machiavellianism to deception. While their primary variable of interest was non-verbal behavior (visual interaction), they do provide data which is suggestive of verbal differences as well. In the experiment, each of 48 subjects (24 males, 24 females) were either implicated in cheating on an experimental task (N=40) or not implicated (N=8). Following the manipulation, each subject was interviewed by the experimenter concerning his/her behavior during the experiment. The interview was divided into two portions. The first portion of the interview consisted of open-ended questions about the method used by subjects to arrive at their answers to the problem. The second portion of the interview consisted of the subjects responses to the experimenter's accusations of cheating.

Judgements of the plausibility of statements in the pre and post accusation conditions were made by judges using the audio tape data. No significant differences were observed between high and low Machiavellians in the pre-accusation condition. In the post-accusation condition, high Machiavellians were judged to lie more plausibly than low Machiavellians.

Knapp, Hart, and Dennis (1974) conducted a study of deceptive behavior, focusing upon the role of language choice. Knapp, et al., video-taped segments of interviews in which subjects argued both in

FIGURE 2

Interaction Model of Machiavellian Personality and Situational Factors



favor of and against a proposition concerning veteran's benefits. Segments in which the subject's arguments were counter to their true beliefs were classified as deceptive. Behaviors in deceptive and non-deceptive segments were compared.

While a variety of measures related to language choice were used, only two yielded significant results. High Machiavellians were observed to use significantly more words and significantly more different words than low Machiavellians. Analysis of the use of speech errors (e.g. uh, er, ah), self references (e.g. I, me, mine), group references (e.g. we, us, our), other references (e.g. they, them), past references (e.g. was, has, had), future references (e.g. will, shall), absolute verbs (all forms of "to be"), qualifications (e.g. may, should, could), and allness terms (e.g. every, all, none) yielded non-significant results.

The findings of Knapp and his colleagues, while somewhat disappointing, are limited. First, it is possible that the situation was not salient for the high Machiavellian subjects. In contrast to the study of Exline, et al. (1970), where deception was induced without subject's awareness of the intent of the study, the subjects of Knapp, et al., were aware of the purpose of the study. That is to say that there was no perception of consequences connected with the outcome of the experiment for these subjects, as there was for the subjects of the Exline study. Second, Knapp, et al., did not test for interactions between Machiavellianism and deception for the language variables.

Several studies suggest that the communication behaviors of high Machiavellians are more manipulative than the communication behaviors of low Machiavellians. Geis, Christie, and Nelson (1970), McLaughlin (1970)

and Bergner (1972) studied communication in situations which provided opportunities for manipulations.

Subjects (N-27) in the Geis, et al. (1970) study were placed in the role of experimenter and asked to administer a personality test to another subject (stooge) after having taken the same test themselves. Subjects were informed that the previous student experimenter who had tested them had performed three simple deceptions, and the subjects were given permission to "use your power arbitrarily" in testing their subjects. Verbal and non-verbal behaviors of subjects were observed by a hidden observer who judged behaviors as manipulative or non-manipulative. Those behaviors judged manipulative were coded into predefined categories. Behaviors which could not be coded were either recorded or paraphrased. Verbal behaviors were coded by internal content (meaning) and behaviors recorded as a single manipulation, ranged from a single word to several sentences. Initially, six categories of verbal manipulations and four categories of non-verbal manipulations were used. To account for uncodable behaviors, an additional five verbal manipulation categories were developed.

Analysis of the data revealed significant differences in the number of manipulations performed, variety of manipulations performed, magnitude of lies told, number of verbal distractions, number of innovative manipulations, and variety of innovative manipulations.

Two of these differences were especially revealing. The first difference reflects the total number of manipulations. High Machiavellians averaged 15.43 manipulative acts per administration compared to an average of 7.08 acts by the Low Machiavellians. The second difference

of interest is the number of innovative manipulations, manipulations not suggested by the experimental induction. High Machiavellians averaged 5.93 innovative manipulations ranging across an average of 3.57 categories compared to an average of 1.69 innovative acts across 1.15 different categories for the Low Machiavellians.

In contrast to the verbal data, the analysis of non-verbal behaviors was disappointing. Only 8 of the 27 subjects engaged in non-verbal manipulations. Of those 8, six were High Machiavellians. While means for the two groups differed in the expected direction, the differences were not significant.

McLaughlin (1970) conducted a study similar to that of Geis, et al. (1970), using a verbal learning task as the experimental situation. McLaughlin found that High Machiavellians were more manipulative than Low Machiavellians, particularly with respect to the use of threats and deception.

Bergner (1972) investigated the use of influence attempts in a simulated industrial setting. Subjects (N=120) played the role of supervisor for 4 workers located in another room, two of whom produced above standard and two of whom produced below standard. Subjects were told that they would be rewarded if they could get all four workers to produce above standard. Subjects were placed in either a reward, coercion, or reward-plus-coercion condition and worker production was held constant for all subjects. Berger found no significant differences in the number of influence attempts by High and Low Machiavellians. Influence attempts made by High Machiavellians were, however, judged more manipulative than those by Low Machiavellians.

Several bargaining type studies also indicate that High and Low Machiavellians communicate differently. Studies by Geis (1970a) and Schwendiman (1971) provide indirect evidence. A recent study by Long (1976) provides more direct evidence.

Geis (1970a) attempted to determine how High Machiavellians achieved success in a three-person-bargaining game. Geis used three trained observers to identify and code five game-relevant behaviors during each session. The five behaviors were: (1) proposals to form a coalition; (2) acceptance of coalition proposals; (3) rejection of coalition proposals; (4) breaking of existing coalition conditions; and (5) advice, a suggestion or warning designed to influence other players.

While these five variables represent only a portion of the total interaction, they do appear to reflect critical communication encounters. Interestingly, only one of these variables yielded significant results. High Machiavellians were more likely to maintain existing coalitions and Low Machiavellians were more likely to break existing coalitions. The lack of significant findings for the remaining variables could be interpreted to suggest that there are no significant differences in the communication behaviors of High and Low Machiavellians.

Two factors suggest that such an interpretation is not warranted. First, High Machiavellians were more successful than Low Machiavellians. To the extent that communication is a critical element in the game situation, differences must exist at some level of analysis. Second, an analysis of the distribution of behaviors suggests that some differences must exist. Analysis of the distribution of behaviors revealed that there was a significant tendency for communication to be directed at

the High Machiavellians. Geis (1970) provides a description of the pervasive nature of the Machiavellian influences.

> At the first step in creating structure, making offers, High Machiavellians did not differ from other players except for virtually imperceptible tendencies to make more and better offers. Even without statistically discernable salience, however, they somehow elicited significantly more offers from each of the other two members of the triad than either of them drew from the other. . .at each succeeding step in determining the final group structure, the controlling influence of the higher Machiavellian in the group was apparent (p. 142-143).

Schwendiman (1971) also investigated Machiavellian behavior in a three-person bargaining game. Schwendiman found no significant differences between High and Low Machiavellians for the amount of money won in either a low incentive or a high incentive condition. However, the offers of High Machiavellians in the high incentive condition were judged more aggressive than the offers of the Low Machiavellians.

Long (1976) investigated the communication behavior of High and Low Machiavellians in a bargaining situation using the Bales (1950) Interaction Process Analysis system. Long's subjects were asked to reach consensus on a problem solving case involving ethical and moral issues. Prior to interacting, one subject was asked to indicate a prior position on an attitude instrument and informed that the other participant had taken an opposite position. The subject was then told he would be paid one dollar for each step on the attitude scale the other subject moved toward the first subject's position. The second subject was simply informed of the first subject's position and told that he would be paid one dollar for each change away from the first subject's original position on the attitude instrument. Consistent with expectations, High Machiavellians won three times as much money as Low

Machiavellians.

Long analyzed communication in randomly selected segments of video tapes. His analysis revealed that in contrast to Low Machiavellians, Highs were less cooperative, less tension relieving, less agreeable, and gave fewer suggestions. Low Machiavellians sought more information and suggestions than did High Machiavellians. Finally, High Machiavellians were judged to be more antagonistic than Low Machiavellians.

The body of research reviewed here suggests strongly that under the appropriate conditions High and Low Machiavellians communicate differently. As language is the primary vehicle for communication, it is reasonable to assume that differences in language behavior may account for Machiavellian behavior. Only a single study among those reviewed attempted to study language as a variable in Machiavellian behavior and with disappointing results. As with any area of research, the results of a single study should not be considered conclusive. It is possible that the Knapp, et al. experimental induction was not salient for High Machiavellians or that the language categories utilized were not appropriate. The present study represents a second attempt to link language to Machiavellian behavior.

The studies reviewed above suggest three types of experimental situations in which High and Low Machiavellians communicate differently: Deception, manipulation, and bargaining. In the present study, communication in a bargaining situation will be studied. The bargaining situation has been selected because in contrast to the other two situations, bargaining games allow the operationalization of power as a situational variable. Also, power as a variable in Machiavellian behavior has been

previously investigated.

Geis (1970b) studied the relationship between Machiavellianism, power, and success in a three person bargaining game. The game involved bargaining for shares of a total payoff of 100 points. Each player received a hand of six power cards at the beginning of each game. During each turn a player would throw a pair of dice and move his marker a multiple of the higher die value determined by a power card used from his hand. The first player to reach the goal received the 100 points. Players were allowed to form coalitions and distribute points as they pleased. Power was distributed in such a manner as to allow any two players to form a winning coalition. Two power conditions were investigated: One in which all powerhands were known to all players (unambiguous), and one in which players were aware of only their own hands (ambiguous).

Interestingly, differences in success for the High Machiavellians were observed in the two power conditions. Geis found that in the ambiguous power situation, High Machiavellians outscored Low Machiavellians independent of power position. In the unambiguous power situation, the average score of High Machiavellians increased with power.

Thus, an unambiguous power situation and Machiavellianism provides an opportunity to explore how the interaction between a personality variable and the situation is expressed through communication behavior. Because the Creative Alternative Game represents an unambiguous power situation the following relationship between Machiavellianism and Collusion is hypothesized in this study.

H_1: Dyads in which player o has a higher Machiavellianism score than p will be more likely to engage in collusion than dyads in which p has a higher score than o.

Hypothesized Verbal Behaviors

Verbal behavior, as a reflection of an individual's reality, contains elements of both personality and situation. That is in a practical sense, we often define personalities and situations based on observations of linguistic utterances and the manner in which they are constructed. Consequently, personality, situation, and verbal behavior are best viewed as related variables. In the following sections, relationships between selected verbal behavior variables, and collusion, power, and Machiavellianism are hypothesized.

The hypotheses presented here fall into two categories: Hypotheses which are suggested by previous literature and hypotheses which are derived from a consideration of the characteristics of the variables to be studied. Ten hypotheses relating to nine verbal behaviors are presented. Verbal behaviors of interest are: Total words, total utterances, nouns, nouns with sensory referents, nouns accompanied by one or more modifiers, verbs accompanied by one or more modifiers, total unmodified verbs and nouns, self reference pronouns, and feedback cues (e.g. yes, no, why).

Total words and total utterances are indices of the amount of verbal behavior occurring. An utterance is the conceptual equivalent of the sentence in written communication. Two of the studies reviewed in the Machiavellianism section suggest that High Machiavellians communicate more than Low Machiavellians. Geis, et al. (1970) observed that High Machiavellians engaged in more manipulative acts than Low Machia-

vellians. Knapp, et al. (1975) observed that High Machiavellians used more total words than Low Machiavellians. In the present study, the following hypotheses related to Machiavellianism and amount of verbal behavior are tested.

H_2: There will be a significant positive correlation between Machiavellianism and the total number of words encoded.

H_3: There will be a significant positive correlation between Machiavellianism and the number of utterances encoded.

Some nouns are used to denote sensory aspects of reality: Persons, places, or things. Other nouns may have non-sensory referents. The use of adjectives or prepositional phrases as modifiers of nouns increases their specificity of meaning. In contrast to Low Machiavellians, High Machiavellians are described as cognitively oriented, attending to explicit cues in the environment. This facet of the Machiavellian character suggests the following hypotheses which are tested in the present study.

H_4: There will be a significant positive correlation between Machiavellianism and the use of nouns.

H_5: There will be a significant positive correlation between Machiavellianism and the use of nouns with sensory referents.

H_6: There will be a significant positive correlation between Machiavellianism and the use of nouns accompanied by one or more modifiers.

Feedback cues are defined conceptually as any linguistic element encoded by a participant in a conversation which reduces ambiguity for another participant. Words included in this category indicate either agreement, disagreement, or the need for additional information. Three assumptions are made about feedback cues and their use in this study.

First, effective bargaining should be characterized by an efficient exchange of information. Second, feedback cues are responses. Third, High Machiavellians initiate and control interaction when possible. These assumptions suggest the following hypotheses which are tested in this study.

H_7: Collusive dyads will encode significantly more feedback cues than non-collusive dyads.

H_8: There will be a significant negative correlation between Machiavellianism and the use of feedback cues.

Self-reference pronouns such as I, me, we, and us, are used in utterances which indicate behavioral intentions or states, or which reflect upon past or future behaviors. Collusion requires an effective coordination of behavior and an understanding of each player's alternatives. The following hypothesis concerning the use of self-reference pronouns is tested.

H_9: Collusive dyads will use significantly more self-reference pronouns than non-collusive dyads.

In the bargaining situation the modifying of verb forms should reflect hesitation or uncertainty in regard to potential or desired courses of behavior. For example, in response to the question, what do you think we should do, a certain response would be, I will take B and you will take D. An uncertain response would be, "I really am not sure," where "really" and "not" are adverbs modifying a state of being. These verbal behaviors should occur primarily as responses. If the expected Machiavellian-by-power interaction occurs, then the following is expected concerning the use of modified verb forms.

H_{10}: There will be a significant power-by-collusion interaction for the use of verbs accompanied by modifiers.

The hypotheses outlined so far suggest that High Machiavellians will encode similar messages independent of position. The responses of Low Machiavellians will distinguish between collusive and non-collusive dyads. These expectations and the previous expectations concerning the use of modified verbs and nouns suggest one additional hypothesis concerning the total number of unmodified verbs and nouns.

H_{11}: Players in the p position will use more unmodified verbs and nouns than players in the o position.

Summary

This chapter has presented a rationale for this study and identified hypotheses which this study seeks to test. By studying the relationship between verbal behavior and personality variables, situational variables, and other social behaviors, knowledge of the role of verbal behavior in communication should be generated. Opportunity for communication is a necessary cause for collusion. The situation in which collusion can occur provides an opportunity to study the effects of power as a situational variable. Machiavellianism is a personality variable linked to success in bargaining games, power, and communication. Eleven hypotheses were generated concerning the inter-relationship between variables.

The methods and procedures used in the gathering and analysis of the data necessary to test the hypotheses posed in this chapter are presented in the following chapter.

CHAPTER II

METHODS AND PROCEDURES

This chapter outlines the methods and procedures used in the gathering and analysis of data for this experiment. The chapter describes the subjects of the study, the scales and procedures used for the gathering of data, and the steps taken in the analysis of the data.

Subjects

The subjects (N=42) of this study were male undergraduates enrolled in an introductory speech course at a large midwestern university. Randomly selected subjects from this population voluntarily participated in data-gathering sessions outside of class.

Procedures

Approximately four weeks prior to the gathering of experimental data, the Mach IV Scale (Christie and Geis, 1970) was administered in all sections of the basic speech course. The Mach IV scale is a 20-item instrument designed to measure Machiavellianism . The items are presented in a standard six-category Likert format with half of the items reversed. The High Machiavellian responses are scored from "5" to "7", and the Low Machiavellian responses are scored from "1" to "3". No response is scored a "4". Christie and Geis suggest that a constant of "20" be added

to the total score to create a neutral score of "100". Adding the constant, the lowest possible score is "40" and the highest is "160". Christie and Geis (1970) report a mean reliability for the Mach IV across 9 subject populations of .79 and a mean item test correlation of .38. A copy of the Mach IV scale is contained in Appendix A.

A total of 244 males and 189 females successfully completed the questionnaire. The group mean and standard deviation for the males were 94.85 and 14.04 respectively. The group mean and standard deviation for the females were 89.07 and 13.646. This is consistent with Christie's and Geis' (1970) observation that females tend to score lower on measures of Machiavellianism than males.

Due to the potential for a high subject attrition rate in research of the present type, 132 randomly selected males were identified as potential research subjects. A group mean and standard deviation of 94.61 and 15.92 on the Mach IV scale indicated that this sample was representative of the parent population. The selected subjects were contacted during regular class periods about participating in data-gathering sessions.

Those subjects contacted were informed that they had been randomly selected from the males enrolled in the basic speech course as potential subjects in a study of game playing behavior. They were told that participation was voluntary and that approximately one hour of time outside of class, to be arranged at their convenience, would be required. The subjects were told that they would play a simple game with one other student and that the game did not require prior training or physical skills. To induce participation and to make the situation salient, the

subjects were informed that at the end of the study, the player with the highest score would receive a reward of fifteen dollars ($15.00), and the player with the second highest score would receive a reward of ten dollars ($10.00). They were then asked if they would be willing to participate in the study.

Volunteers were informed that they could not be paired with a member of their own class or with someone they knew from another section of the basic course and then asked to indicate, on a previously prepared schedule sheet, when they would be able to participate in the research. Sessions listed were scheduled to begin and end on the hour. The first volunteer for each session was listed as subject A and the second volunteer for each session was listed as subject B. Eighty-two subjects volunteered to participate.

Data was collected over a period of 14 days and a total of 54 subjects participated in data-gathering sessions. Analysis of the Mach IV scores of these subjects yielded a group mean of 94.50 and a standard deviation of 15.07, indicating that this group was representative of the parent population.

Subjects A and B were alternately assigned to the p and o conditions immediately prior to participating in data gathering sessions. Subjects were seated directly across from each other at a comfortable conversational distance. Each subject was given a score sheet and a sheet of instructions explaining how to use and read a hypothetical game matrix (see Appendix B). The game matrix for the Creative Alternative game was placed face-down in front of each of the participants and they were instructed not to look at it until the beginning of the game.

After both subjects read the instructions, the experimenter asked if they understood the instructions. If there were no questions, or after any questions were answered, the experimenter briefly repeated the instructions orally and again asked if the instructions were clear to both players. The subjects were then reminded of the potential for monetary rewards.

Each experimental game consisted of 10 two-minute rounds. Each round was comprised of a 90 second discussion period and a 30 second decision/scoring period. Prior experience with the Creative Alternative game indicates that the two-minute round provides a maximum opportunity for natural interaction. Subjects become distracted from the task if longer periods are utilized. Subjects were notified of the beginning of each new round by the sound of a whistle and of the 30 second period by a sign placed in their field of vision.

Subjects were told they could communicate freely during the discussion period, if they desired to do so, and that they were required to mark their choice of alternatives for each round upon the score sheet and share that information with the other player during the scoring period. Subjects were told that points will not be awarded for any given round unless instructions are followed explicitly.

During the game, the experimenter was in the room with the subjects seated behind the tape recording equipment. The experimenter wore audio-headphones and maintained a posture such that eye contact with the subjects was impossible.

Communication behavior of the subjects was recorded using a Teac 4010-S stereo-tape deck with unidirectional lavolier microphones.

Tapes were 1.0 mil polyester on 7-inch reels. All sessions were recorded at 3 3/4 inches-per-second. Data from one pair of subjects was lost due to a malfunction of the tape recorder.

Subjects were debriefed in their classes after all data had been collected.

Sampling Guidelines

Two rounds of communication behavior were transcribed and analyzed for each pair of subjects. Previous experience with the Creative Alternative game suggests that subjects become aware of and discuss the possibility of engaging in the Creative Alternative in the round prior to the round in which they actually select the BD alternative. Because the communication behaviors of interest are those which precede and coincide with the selection of the Creative Alternative, comparisons were made between groups using two rounds of communication preceding the selection of the BD alternative and two rounds of communication preceding the selection of some other alternative.

Several factors were taken into consideration in selecting and grouping data from dyads for analysis. First, data from pairs of subjects (N=2) who communicated only during the 30 second scoring period were not considered for analysis.

There are two reasons for utilizing this criterion. First, interest in this study is in situations in which communication is an active ingredient. Second, a lack of communication may indicate the presence of some experimental artifact contaminating the situation. Communication requires cognitive involvement. The more communication occurring between subjects, the more they are likely to be successfully

involved with the experimental situation.

Second, data from pairs of subjects (N=3) who engaged in the Creative Alternative during all game rounds was not considered for analysis. While communication still precedes the selection of the BD alternative in this case, the possibility that other prior events are effecting behavior in the situation cannot be ruled out. If subjects select some other initial strategy, then it can be said, with greater certainty, that communication processes occurring in the experimental situation contributed to the selection of the Creative Alternative if and when it occurs.

The third factor considered was consistency. In a four-alternative ten-round game, it is expected that the BD alternative might be selected on an average of 2.5 times, using a random strategy. To minimize the probability of analyzing data from subjects selecting the BD alternative randomly a minimum criterion of three consecutive BD responses was used to identify dyads as purposefully adopting the BD strategy (Steinfatt, 1975). The probability of three consecutive BD choices is approximately 0.02. Thirteen of the 21 dyads meeting criteria 1 and 2 also met criterion 3.

Because no prior estimate of the percentage of subjects likely to meet criterion 3 was available, the following guideline was used in the event that the number of subjects meeting this criterion exceeded the number which did not. Those dyads which met the minimum criterion discussed above, which selected the BD alternative most frequently (N=11), not to exceed half of the dyads successfully meeting other criteria, were grouped and identified as early adopters for purposes of

analysis. The remaining dyads which meet the minimum criterion (N=2) were identified as late adopters and grouped with subjects which did not meet the minimum criterion for purposes of analysis.

The frequency criterion makes certain that there are sufficient rounds in which the late adopters did not select the BD alternative to make comparisons, as suggested previously, possible. That is, rounds of communication for analysis from the late adopters and non-adopters were selected from rounds prior to the frequency cut-off figure selected. For purposes of convenience, the combined group of late adopters and non-adopters will hereafter be referred to as "noncollusive." The group of early adopters will be identified as "collusive."

Data Analysis

Three types of analysis are discussed here. First, the procedures used to determine the number of utterances spoken by subjects is presented. Second, the procedures used in the content analysis of syntactic data are discussed. Third, the statistical procedures and decision rules to be used in the analysis of data are discussed.

Distribution Analysis

To determine the number of utterances used by subjects, independent judges were used to evaluate typewritten transcripts of the conversations of collusive and noncollusive dyads for selected game rounds. This procedure was used because utterances are meaningful within the context of conversation and utterances are readily recognizable within context by the speakers of the language.

The following procedures were utilized. Typewritten manuscripts of the conversations were prepared. Speaker change was indicated on the manuscripts through the use of an asterisk (*) and by capitalizing the first letter of the first linguistic unit of a speaker's turn. No other forms of punctuation or syntactic cues were provided.

Six sets of messages were constructed from the original set of manuscripts, with each manuscript being randomly assigned to three message sets. Each message was judged independently by three judges with no two judges evaluating the same set of messages.

The six judges were given a training session which included (1) a presentation and a discussion of the definition of the utterance construct, and (2) instructions on marking messages to indicate the end and beginning of utterances, and (3) the evaluation of two sample messages by each judge to determine if the instructions were understood and to provide an estimate of inter rater reliability. Analysis of the two sample messages yielded an average of 76 percent and 80 percent agreement for the six judges. Instructions given to the judges and copies of the sample messages are contained in Appendix C.

Content Analysis

Syntactic data and feedback cues were analyzed using SLCA-II (Cummings and Renshaw, 1976), a computer program for analyzing the complex grammatical characteristics of verbal behavior. The categories identified by the program are drawn from traditional grammatical taxonomies and the propositional relationships used in formal logic (Cummings, 1970; Cummings and Renshaw, 1976). Categories corresponding to the variables of interest in this study are identifiable using the program.

To make possible comparisons between messages of varying lengths, the program divides the frequency of occurrence for the members of each category by the sum of nouns, verbs, and modifiers. Previous research (Cummings, 1970) indicates the correlation between this denominator and the total number of words in messages is above .90. Because of this relationship, the figure obtained by dividing the frequency of occurrence within a category by this denominator is the conceptual equivalent of a syntactic type-token ratio.

Statistical Analysis

Two aspects of the statistical analysis of data are considered here. First, tests used in the analysis of data are identified. Second, criteria used in the evaluation of the results of statistical tests are discussed.

To test the hypothesized relationship between Machiavellianism and power, a test for significant differences between proportions was used. The proportion of dyads in which the Mach IV score for o was greater than the Mach IV score for p which selected the BD alternative for at least three consecutive rounds was compared to the proportion of dyads in which the Mach IV score for o was less than the Mach IV score for p which selected the BD alternative for at least three consecutive rounds.

Analysis of co-variance procedures were used to test all relationships between communication and other variables. Machiavellianism was treated as a co-variant with power and collusion treated as fixed factors yielding a 2 x 2 factorial analysis of co-variance design.

Because players p and o are communicating over time together in the experimental situation, it could be argued that their behaviors are not independent. To test this assumption, and to determine if tests for related measures or tests for unrelated measures should be used in the analysis of data, Pearson r's were calculated between players p and o for the dependent verbal behaviors. All r's were non-significant (see Table 1 in Appendix D) and it was decided that tests for independent measures were appropriate.

Statistical tests are decision-making tools. The interpretation of the results of statistical tests, however, is problematic. That is, a variety of factors related to the probabilities of error must be taken into consideration before deciding whether to: (1) reject the null hypothesis, (2) not reject the null hypothesis, or (3) suspend judgement and wait for more evidence (Hays, 1973).

Cohen (1969) and others (Brewer, 1972; Katzer and Sodt, 1973; Chase and Tucker, 1975) have observed that too often social scientists do not take into account the probability of incorrectly accepting the null hypothesis in interpreting statistical results. The implication of these observations is that an uncontrolled rate of Type II error is undesirable. This leads to the conclusion that in planning and interpreting the results of research the social scientist should take into account the probability of Type II error relative to the probability of Type I error. Cohen (1965) recommends a four to one ratio of Type II to Type I error. That is a test for which an alpha level of .05 has been established should have power of .80 to maintain the desired 4-1 ratio. This ratio provides a rule for identifying appropriate

probability levels for making decisions to accept the null hypothesis or to suspend judgement.

In the present study, decisions to reject the null hypothesis are based upon an alpha level of .05. That is, statistical values whose probability of occurrence by chance is less than .06 are considered sufficient evidence to reject the null hypothesis. The null hypothesis is not rejected when the probability value for the results of a particular test is greater than the probability of beta error divided by 4. Judgement is suspended when the probability value for a particular test is greater than .05 and less than or equal to the estimated probability of beta error divided by 4.

The probability of beta error for particular tests was determined using tables provided by Cohen (1969). Beta is a function of alpha, n, and effect size. The n used for each test, an alpha of .05 and a medium effect size were used in determining alpha. Cohen (1965; 97) recommends the medium effect size in estimating the power of statistical tests when there is no a priori basis for selecting an appropriate effect size. The critical values for each test used in this study are presented in Figure 3.

The procedures and tests outlined here should provide adequate tests of the hypotheses suggested in Chapter I. The results of the data analysis are presented in Chapter III.

FIGURE 3

Critical Values for the Interpretation of Statistical Tests*

Test	Beta	Decision Reject the Null Hypothesis	Decision Not Reject the Null Hypothesis	Suspend Judgement
Analysis of Co-Variance				
Machiavellianism** (co-variate)	.67	.05	.18	.06 to .17
Power (main effect)	.64	.05	.17	.06 to .16
Collusion (main effect)	.66	.05	.17	.06 to .16
Power x Collusion (interaction)	.82	.05	.21	.06 to .20
Test for Significant Difference of Proportions	.64	.05	.17	.06 to .16

* All values are rounded to 2 decimal places.

** Cohen (1969) does not provide power estimates for tests on co-variates. The values used are based on a test for main effects with df= (1, 37).

CHAPTER III

RESULTS

Three sets of results are reported in this chapter. First, the results of the analyses outlined in the preceding chapter are presented. Second, on the basis of the reported results, a case is made for reanalyzing the data and the results of the reanalyzed data are reported. Third, additional variables suggested by the results of the previous data analyses are identified and analyzed. For ease of reading, the results of the analysis of covariance are organized according to dependent variables. Summary tables for all statistical tests are presented in Appendix D.

Decisions concerning the rejection of the null hypothesis for tested relationships will be made using the rules outlined in the preceding chapter. When the obtained probability value for any test statistic is $p \leq .05$ the decision rule will be to consider the null hypothesis rejected. When the obtained probability value is greater than the probability of estimated beta error divided by 4 (see Figure 3) the decision rule will be to not reject the null hypothesis. When the obtained probability is between these two values the decision rule will be to suspend judgement concerning the null hypothesis. These decision rules should insure an acceptable ratio of Type I to Type II

error (Cohen, 1965).

Collusion

It was initially hypothesized that dyads in which player o had a higher Mach IV score than player p would be most likely to engage in collusion. Of the 14 dyads in which player o's Mach IV score was greater than player p's Mach IV score, 10 dyads met the pre-established criterion for defining collusive behavior. Seven of 13 dyads in which the Mach IV score for player o was less than the Mach IV score for player p were identified as engaging in collusion. A test for significant differences between proportions yielded a z value of 0.919 resulting in a decision to not reject the null hypothesis.

Total Words

On the basis of prior research (Geis, et al., 1970; Knapp, et al., 1975), it was hypothesized that a positive relationship would be observed between Machiavellianism and the number of words encoded. The results of the data analysis ($F<1$, see Table 2) support a decision to not reject the null hypothesis for Hypothesis 2. Tests for unhypothesized relationships also yielded non-significant results (see Table 2).

Total Utterances

Hypothesis$_3$ posits a positive relationship between Machiavellianism and total utterances. Analysis of the data regarding this relationship yielded an F value of 1.011 ($df=1,37$; $p=.32$) resulting in a decision to not reject the null hypothesis. Tests for unhypothesized relationships also yielded non-significant results ($F<1$, see Table 3).

Nouns

Analysis of co-variance for the use of nouns yielded an F value of 1.186 (df=1,37; p=.28) for the collusion by power interaction and values of less than 1.0 for all other tests of relationships (see Table 4). On the basis of these results, a decision was made to not reject the null hypothesis for $Hypothesis_4$, which posits a positive relationship between Machiavellianism and the use of nouns.

Nouns With Sensory Referents

$Hypothesis_5$ suggests a positive relationship between Machiavellianism and the use of nouns with sensory referents. Analysis of the data resulted in a decision to not reject the null hypothesis for $Hypothesis_5$ ($F<1$, see Table 5). No significant relationship was predicted for the interaction between collusion and power. However, analysis of this relationship yielded an F value of 1.985 (df=1,37; p=.16) resulting in a decision to suspend judgement concerning this relationship.

Nouns Accompanied By Modifiers

$Hypothesis_6$ predicted a significant relationship between Machiavellianism and the use of nouns accompanied by modifiers. The analysis of data resulted in a decision to not reject the null hypothesis for $Hypothesis_6$ ($F_{(1,37)} = 1.37$; p=.29; see Table 6) and a decision to suspend judgement concerning the relationship between power and the use of nouns accompanied by modifiers ($F_{(1,37)} = 3.572$; p=.06).

Feedback Cues

Analysis of the feedback cue data resulted in decisions to not reject the null hypothesis for Hypotheses$_7$ and $_8$ ($F<1$, see Table 7). Hypothesis$_7$ predicted that collusive dyads would use more feedback cues than non-collusive dyads. Hypothesis$_8$ concerns Machiavellianism and the use of feedback cues. The interaction between collusion and power yielded an F value of 1.699 (df=1,37; p=.20) resulting in a decision to suspend judgement.

Self Reference Pronouns

Hypothesis$_9$ predicted that collusive dyads would use more self reference pronouns than non-collusive dyads. None of the values obtained in the statistical analysis of self reference pronouns were significant ($p<.05$) or sufficiently large to suspend judgement (see Table 8). On the basis of these results, the decision was made to not reject the null hypothesis for Hypothesis$_9$.

Verbs Accompanied by Modifiers

Hypothesis$_{10}$ posited a significant collusion by power interaction for the use of verbs accompanied by modifiers. The analysis of the collusion by power interaction yielded an F value less than 1.0 (see Table 9) resulting in a decision to not reject the null hypothesis for Hypothesis$_{10}$. The F value for the main effect for power was 3.301 (df=1,37; p=.07) resulting in a decision to suspend judgement.

Unmodified Verbs and Nouns

The results of the analysis of unmodified verbs and nouns yielded two significant F values. As predicted by Hypothesis$_{10}$, a significant

main effect for power was observed ($F(1,37)=5.625$; $p=.02$; see Table 10). Players in the p position used more unmodified verbs and nouns than players in the o position. In addition to the main effect for power, a significant collusion by power interaction was observed ($F(1,37)=5.062$; $p=.03$).

Summary of Results

The results of the data analysis yielded two F values sufficient to reject null hypotheses, and four F values sufficient to suspend judgement concerning null hypotheses. Both a significant main effect for power and a significant interaction between collusion and power for the proportion of unmodified verbs and nouns were observed. Main effects for power for the use of modified nouns and modified verbs and interaction effects between collusion and power for the use of feedback cues and nouns with sensory referents resulted in decisions to suspend judgement concerning the null hypotheses. For all other relationships tested, the null hypothesis was retained.

Discussion of Co-variance Analysis

The interpretation of the results of the data analysis just reported is somewhat problematic. The interpretation of differences between groups adjusted on the basis of a co-variate can be misleading if the observed relationship between the co-variate and the criterion variable is spurious. In such cases, a co-variate may obscure the true relationship between direct variates and criterion variables.

In the present study, the null hypothesis was retained for tests of the relationship between Machiavellianism and all dependent variables. That the null hypothesis was so consistently retained constitutes

justification for re-analyzing the data to determine if the variance attributed to Machiavellianism in the analysis of co-variance could be attributed to collusion, power, or the interaction between collusion and power. All dependent verbal behaviors were re-analyzed using a 2 x 2 factorial analysis of variance design with collusion and power treated as fixed factors.

Analysis of Variance Results

The re-analysis of data yielded three F values with probabilities less than .05 and three F values with probabilities sufficient to justify suspending judgement. Tests of relationship for the variables "total words," "total utterances" and "nouns" yielded F values which resulted in decisions to retain the null hypothesis for the relationships tested. Tests on the variables "modified nouns," "feedback cues," "self-reference pronouns," "modified verbs," and "unmodified verbs and nouns" each yielded an F value sufficient to reject the null hypothesis or suspend judgement.

Re-analysis of the data related to the use of "nouns with sensory referents" yielded results similar to the analysis of co-variance. The analysis yielded a p value of approximately .17 (see Table 11) for the interaction between collusion and power, resulting in a decision to suspend judgement concerning the null hypothesis. Examination of the cell means (see Table 12) suggests that the observed degree of relationship might be attributable to the differences in the encoding behaviors of players p and o in the collusive dyads, while the cell means for p and o in the non-collusive dyads appear approximately equal.

Analysis of co-variance for the use of modified nouns resulted in a decision to suspend judgement concerning the null hypothesis for the relationship between power and the use of modified nouns. The analysis of variance for this data indicates that a decision to reject the null hypothesis for this relationship is warranted ($F_{(1,38)} = 5.961$; $p=.02$; see Table 13). Examination of the cell means (see Table 12) reveals that players in the less powerful p position used proportionally more modified nouns than players in the o position.

Re-analysis of the feedback cue data supported the original decision to suspend judgement concerning the null hypothesis for the interaction between collusion and power ($F_{(1,38)} = 1.718$; $p=.20$; see Table 14). Examination of cell means for the variable (see Table 12) suggests that p uses more feedback cues than o in collusive dyads and that o uses more feedback cues than p in the non-collusive dyads.

As with the analysis of co-variance, the analysis of variance for the use of self-reference pronouns warrants a decision to suspend judgement concerning the null hypothesis for the relationship between collusion and the use of self-reference pronouns ($F_{(1,38)} = 2.548$; $p=.12$; see Table 15). Cell means (see Table 12) indicate that collusive dyads may use more self-reference pronouns than non-collusive dyads.

Analysis of co-variance for the use of modified verbs yielded a decision to suspend judgement for the main effect due to power. The re-analysis indicates that a decision to reject the null hypothesis for the main effect due to power is warranted ($F_{(1,38)} = 9.892$; $p=.003$; see Table 16). Examination of the cell means (see Table 12) reveals that players in the more powerful o position modify more verbs than

players in the less powerful p position.

The analysis of co-variance for the use of unmodified verbs and nouns yielded significant F values for the main effect due to power and the interaction between collusion and power. Reanalysis of the data, yielded a decision to reject the null hypothesis for the interaction between collusion and power ($F(1,38) = 5.137$; $p=.03$; see Table 17) and a decision to not reject the null hypothesis for the main effect due to power ($F(1,38) = 1.172$; $p=29$). To determine the sources of the significant interaction, the differences among the cell means were analyzed using Duncan's multiple Range statistic (Bruning and Kintz, 1968). The analysis of means (see Table 12) revealed that subjects in the p position in the non-collusive dyads use significantly fewer unmodified verbs than all other players and that players in the o position in the non-collusive dyads used significantly more unmodified verbs and nouns than players in the o position of the collusive dyads.

Additional Variables

To clarify relationships observed in the previous analyses of the data, several related variables were selected for analysis. Additional variables considered are unmodified verbs, unmodified nouns, verb modifiers, and noun modifiers.

To determine if the significant collusion by power interaction for the use of unmodified verbs and nouns was attributable to either the noun or verb sub-categories, unmodified nouns and unmodified verbs were analyzed separately.

The analysis of unmodified verbs yielded a significant collusion by power interaction (F (1,38) = 5.031; p=.03; see Table 18). Examination of the cell means (see Table 20) reveals that players in the p and o positions exhibit different patterns of encoding behavior in the collusion and non-collusion conditions. In the collusive dyads, players in the p position use more unmodified verbs than players in the o position. This pattern is reversed in the non-collusive condition. Players in the o position in the non-collusive condition used the most unmodified verbs while players in the p position in the non-collusive condition used the fewest.

The analysis of unmodified nouns indicates that a decision to suspend judgement for the collusion by power interaction is warranted, (F (1,38) = 1.773; p=.19; see Table 19). Examination of the cell means (see Table 20) reveals a tendency toward the pattern of encoding observed for the use of unmodified verbs.

Because the modified verbs and modified noun variables are not a complete index of the extent to which modifiers are used, a decision was made to examine the proportions of verb modifiers and noun modifiers.

The analysis of verb modifiers yielded F values of less than 1.0 for all tests of significance (see Table 21). Thus a decision was made to not reject the null hypothesis for the relationships tested.

The analysis of noun modifiers yielded a significant F value for the collusion by power interaction (F (1,38) = 6.247; p=.02; see Table 22) and a significant F value for the main effect for power (F (1,38) = 6.161; p=.02). Analysis of the cell means (see Table 20) reveals that Player p in the non-collusive dyads used significantly

more noun modifiers than other players. Thus, the interaction effect is attributable primarily to the discrepancy between positions o and p in the non-collusive dyads.

Summary of Results

In the present study, the relationships between the independent variables of Machiavellianism, power, and collusion and 13 dependent verbal behaviors are considered. Analysis of the data using co-variance techniques resulted in decisions to retain the null hypothesis for tests of relationships between Machiavellianism and the dependent verbal behaviors. On the basis of these results, the decision was made to re-analyze the data, dropping Machiavellianism as an independent variable.

Re-analysis of the data yielded three significant F values and three F values sufficient to suspend judgement concerning the null hypothesis. Power was observed to be significantly related to the use of both modified verbs and modified nouns. A significant interaction between collusion and power for the use of unmodified verbs and nouns was also noted. Judgement was suspended for the relationship between collusion, and self-reference pronouns and the relationships between collusion, power, and the dependent variables, feedback cues, and nouns with sensory referents.

Four additional variables were considered. Analysis of noun modifiers yielded a significant interaction between collusion and power. Analysis of verb modifiers resulted in decisions to retain the null hypothesis. Analysis of unmodified verbs yielded a significant collusion by power interaction. Judgement was suspended for the

interaction between collusion and power for the use of unmodified nouns.

A discussion of this study and the results reported here is presented in the following chapter.

CHAPTER IV

DISCUSSION

This chapter is presented in four parts. In the first section, interpretation of the data is considered. Section 2 considers the significance of this research effort. Limitations of this study are considered in the third section. Finally, suggestions for future research are presented.

Interpretation

In the present study, the null hypothesis was not rejected for 10 of the 11 research hypotheses presented in Chapter I. Judgement was suspended for Hypothesis 9, which posited that collusive dyads would use more self-reference pronouns than non-collusive dyads. The data analysis did indicate significant relationships which were not predicted for the use of "modified nouns," "modified verbs," "unmodified verbs and nouns," "unmodified verbs," and "noun modifiers." Potentially significant relationships were observed for the use of "feedback cues," "nouns with sensory referents," and "unmodified nouns." For reasons discussed in parts 2 and 3 of this chapter, a simple interpretation of these results is not possible. Some observations about the data are possible, however.

with the exception of three variables, "modified verbs," "modified nouns," and "self-reference pronouns," the data is characterized by interactions between collusion and power. This observation includes the three variables for which the null hypothesis was rejected, "unmodified verbs and nouns," "unmodified verbs," "noun modifiers," and the three variables for which judgement was suspended, "nouns with sensory referents," "feedback cues," and "unmodified nouns."

Two patterns of interactions are apparent in the data. The first pattern is characterized by a reciprocal or symmetrical pattern of encoding across power positions in the collusive and non-collusive dyads. That is, the behavior of the more powerful player o in the collusive dyads is similar to the behavior of the less powerful p in the non-collusive dyads; and the behavior of the less powerful p in the collusive dyads is similar to the behavior of o in the non-collusive dyads. This pattern appears to characterize the use of unmodified verbs and perhaps feedback cues.

The first pattern of interactions indicates that social behaviors are not necessarily a simple function of message characteristics. Messages interact with situational variables such that similar messages do not yield similar results. For this pattern of interactions, who says what appears to be most important. When the less powerful p uses more unmodified verbs than o, they are identified as collusive. On the other hand, dyads in which p uses fewer unmodified verbs than o are observed to be non-collusive.

The second pattern of interactions is characterized by an asymmetrical pattern of encoding. In this pattern, the behavior of

players p and o within one of the two collusion conditions are similar while behaviors of p and o in the other condition are different. Also, at least one of the cell means in the condition in which significant differences are observed is also significantly different from at least one mean in the other condition. That is $p_1 = o_1$, $p_2 \neq o_2$, and p_2 and/or $o_2 \neq p_1$ and/or o_1. This pattern appears to characterize the use of unmodified verbs and nouns, noun modifiers, and perhaps nouns with sensory referents and unmodified nouns.

The second pattern of interactions suggests that there are verbal behaviors which do uniquely characterize collusive and non-collusive relationships. However, these behaviors are characteristic of a single power position. Thus, players in collusive dyads behave similarly with respect to the use of unmodified verbs and nouns, noun modifiers, and unmodified nouns while the less power p in the non-collusive dyads uses fewer unmodified verbs and nouns, fewer unmodified nouns, and more noun modifiers than o in the non-collusive dyads.

The main effect results are more easily understood. Two of the variables studied appear related to the power construct. Players in the more powerful o position used more modified verbs and fewer modified nouns than players in the less powerful o position. It also appears that the hypothesis that collusive dyads use more self-reference pronouns remains tenable.

Significance

Research may be considered significant for any number of different reasons. This study is considered significant because of the relationships it reveals among the concepts studied. It is also

considered significant because of what it tells us about the methods used in the gathering and analysis of data. It may also be considered significant on the basis of its potential contribution to the theoretic maturity of its parent discipline.

Three types of knowledge claims are made concerning relationships among concepts. First, this study identifies five manifest verbal behaviors which appear to be significantly related to collusion and/or power. Second, this study provides a substantive body of data to support the conclusion that Machiavellianism is not related to the manifest verbal behaviors studied. Third, four manifest verbal behaviors are identified which may be related to collusion and/or power. Knowledge claims of the first and second type are sufficient to document significance on the basis of knowledge concerning relationships.

With respect to methodological significance, two aspects of this study are considered important. First, the results of this study reflect the utility of the computer program SLCA-II for the study of verbal behavior. Second, subjectively speaking, the present study represents a satisfactory test of the decision rule guidelines suggested in Chapter II. This means that statements concerning the acceptance or rejection of the null hypotheses are made with considerable confidence. Subsequent research will however, be able to make an objective assessment of the effect of these decision rules upon the Type II error rate.

With respect to potential theoretic contributions, two claims are made. First, this study is the first to describe the verbal behavior of collusive and non-collusive dyads. Second, this study links communication at a syntactic level to communication at a pragmatic level

(Morris, 1946).

The first claim to significance is predicated upon the precept that necessary observation and description are necessary precursors. In recent journal articles, Fisher (1977), Scheidel (1977), and Hawes (1977) have all noted the relationship between description and theory, and also observed the need for more descriptive research within the discipline of speech communication. Hawes (1977, 64) summarizes this viewpoint in a critique of theoretic approaches to the study of communication.

> Communication has never gone through the phase of systematically observing, describing, and interpreting all manner of human communicative activity. During the three or so generations we have been training social and behavioral scientists, few have been trained to observe, describe, and interpret; most have been trained to experiment. But now, concern is being expressed about the questions we ask and the variables we manipulate and control. . . .Perhaps, so goes the thinking, the problem is a confusion over which mold we ought cast our theories into. On the contrary, I think the problem is insufficient description and interpretation of the communicative activity our theories are supposed to explain.

Hopefully, as suggested in the first chapter, studies of the present type will lead to a more precise conceptualization of communication. Previously, potential for communication, the opportunity to converse in a face-to-face setting, has been identified as a cause of the social behavior collusion. In the present study, certain verbal behaviors of collusive and non-collusive communicators are observed to differ significantly. Some of the verbal behaviors are also observed to covary with the situational variable power. These findings are evidence for the potential of this line of research to produce meaningful hypotheses and theories.

The second claim to significance is predicated upon Morris' division of the study of sign behavior into the study of syntactics, semantics, and pragmatics. Syntactics refers to the relationship between signs. Semantics refers to the relationships between signs and their referents. Pragmatics refers to the relationships between signs and their users. More explicitly, pragmatics, refers to what users do with signs, their social effects (Morris, 1946, 1971). A theory of signs or communication must account for variance at and between these three levels of analysis.

To say that something is done by some other thing is to imply a cause effect relationship. If communication is a cause of collusion, then, at a pragmatic level of analysis, it can be said that collusion is done by communication. The dependent verbal behaviors in this study, observed to be related to collusive behavior, are syntactic variables. Thus, in this study, communication at a syntactic level is observed to be empirically related to communication at a pragmatic level.

Limitations

The following limitations should be taken into consideration in interpreting the results of this study.

First, the research reported is descriptive. While the time ordering of variables in the study may imply causal relationships, no manipulations of variables were utilized. Thus, causal interpretations of relationships must be considered hypothetical.

Second, the descriptions of encoding behavior are constructed from the analysis of multiple utterances. That is the data may not necessarily be said to characterize particular utterances.

Third, only a single semantic characteristic of the messages was considered. Any attempts to infer meaning based on the analysis of syntactic characteristics or the sensory/non-sensory characteristics of referents is speculative.

Fourth, possible relationships between dependent variables are not considered. It is possible that variables considered in combination may be significantly related to collusion and/or power while when considered independently no significant relationships are observed.

Finally, as the results of a single study, the findings reported here must be considered tentative. Additional observation is necessary to indicate the true generalizability of the results of this study.

Directions for Future Research

As a result of this study, some suggestions are made concerning future efforts. First, future research should consider additional syntactic variables for analysis. The data analyzed here do not present a complete description of the syntactic characteristics of the messages encoded. A complete account of syntactic variation is necessary for the development of theory.

Second, multivariate techniques should be used in the analysis of data. The promise of such an approach is to reduce a large number of observations to a smaller, meaningful, and more precise set of observations. For example, it may be that qualified verbs is a significant

variable when and only when total verbs encoded are also considered.

Third, future research efforts should include semantic analysis of the observed verbal behaviors. Identification of utterances within message corpi as influences attempts, information seeking, information giving, etc. would increase the probability of developing an explanatory theory of considerable power. Concommitant with this third recommendation is the need to determine how subjects approach the experimental situation. The question of how the game is perceived, for example as a problem solving situation or a compliance gaining situation, has significant implications for the development of an investigative and interpretive framework.

Finally additional individual difference variables should be considered. The belief that the characteristics that the individual brings to the situation influence both language behavior and subsequently the outcomes of communication events remains primitive and is an important element of the research model utilized in this study. In addition to other personality variables, future research should consider individual difference variables related to success at problem-solving, such as intelligence or cognitive style.

Conclusion

While none of the hypotheses tested in this study are directly supported by the results, significant relationships are observed between selected verbal behaviors and the situational variable power and the social behavior collusion. These findings support the utility of the research strategy advocated in the first chapter. That is, by considering communication as a complex set of variables, a more precise

understanding of communication and its role in facilitating other behaviors may be achieved. Hopefully, this study will be a useful model in guiding research efforts in this area and in related areas of research.

REFERENCES

Bales, R. Interaction process analysis. Cambridge, Mass: Addison-Wesley, 1950.

Barker, R. G. Explorations in ecological psychology. American Psychologist. 1965, 20, 1-14.

_____.(Ed.) The stream of behavior. Appleton-Century-Crafts, New York, 1963.

_____. Ecological psychology: concepts and methods for studying the environment of human behavior. Stanford, Calif: Stanford University Press, 1968.

_____. Ecology and motivation. In M. R. Jones (Ed.), Nebraska symposium on motivation. Lincoln: University of Nebraska Press, 1960.

Bem, D. J. Self-perception theory. In L. Berkowitz (Ed.), Advances in experimental social psychology, Vol. 6. New York: Academic Press, 1972.

Bergner, L. Use of power, Machiavellianism, and involvement in a simulated industrial setting. Unpublished doctoral dissertation. Temple University, 1972.

Brewer, J. K. On the power of statistical tests in the American educational research journal. American educational research journal, 1972, 9, 391-401.

Bruning, J. L. and Kintz, B. L. Computational handbook of statistics. Glenview, Ill.: Scott, Foresman and Co., 1968.

Brugoon, M. The relationship between willingness to manipulate others and success in two different types of basic communication courses. The speech teacher, 1971, 20, 178-183.

Chase, L. J. and Tucker, R. K. A power analytic examination of contemporary communication research. Speech monographs, 1975, 42, 29-41.

Christie, R. and Geis, F. Studies in Machiavellianism. New York: Academic Press, 1970.

_____. Some consequences of taking Machiavelli seriously. In E. F. Borgatta and W. W. Lambert (Eds.), Handbook of personality theory and research. Chicago: Rand McNally, 1968.

Cohen, J. Statistical power analysis for the behavioral sciences. New York: Academic Press, 1969.

_____. Some statistical issues in psychological research. In B. B. Wolman, (Ed.), Handbook of clinical psychology. New York: McGraw Hill, 1965.

Cummings, H. W. Specified cognitive structures and their effects on language encoding variables. An unpublished doctoral dissertation. Michigan State University, 1970.

_____ and Renshaw, S. L. SLCA-II: A computerized technique for the analysis of syntactic language behavior. Minneapolis: Burgis Publishing Company, 1976.

Dance, F. E. X. and Larson, C. The functions of human communication: A theoretical approach. New York: Holt, Rinehart, and Winston, 1976.

Exline, R., Thibaut, J., Hickey, D., and Gumpert, P. Visual interaction in relation to Machiavellianism and an unethical act. In R. Christie and F. Geis (Eds.) Studies in Machiavellianism. New York: Academic Press, 1970.

Fisher, B. A. Evidence varies with theoretical perspective. Western journal of speech communication, 1977, 41, 9-19.

Geis, F. The con game. In R. Chrsitie and F. Geis (Eds.), Studies in Machiavellianism. New York: Academic Press, 1970a.

_____. Bargaining tactics in the con game. In R. Chrsitie and F. Geis (Eds.), Studies in Machiavellianism. New York: Academic Press, 1970b.

_____, Christie, R., and Nelson, C. In search of the Machiavel. In R. Christie and F. Geis (Eds.), Studies in Machiavellianism. New York: Academic Press, 1970.

Goffman, E. Strategic interaction. Philadelphia: University of Pennsylvania Press, 1969.

Harsanyi, J. C. Measurement of social power, opportunity costs, and the theory of two person bargaining games. Behavioral science, 1962, 7, 67-80.

Hawes, L. C. Alternative theoretical bases: Toward a presuppositional critique. Communication quarterly, 1977, 25, 63-68.

Hays, W. L. Statistics for the social sciences. New York: Holt, Rinehart, and Winston, 1973.

Heider, F. The psychology of interpersonal relations. New York: Wiley, 1958.

Hewes, D. E., Haight, L. and Szalay, S. M. The utility of cross-situational consistency of measures of verbal output: An exploratory study. Paper presented at the annual convention of the International Communication Association, Portland, 1976.

Kelley, H. H. Causal schemata and the attribution process. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valin, and B. Weiner, (Eds.), Attribution: perceiving the causes of behavior, New York: General Learning Press, 1972.

Katzer, J. and Sodt, J. An analysis of the use of statistical testing in communication research. Journal of communication, 1973, 23, 251-265.

Knapp, M. L., Hart, R. B., and Dennis, H. S. An exploration of deception as a communication construct. Human communication research, 1974, 1, 15-29.

Long, D. K. An experimental investigation of selected communication effects of Machiavellianism. Paper presented at the Speech Communication Association Convention, 1976.

March, J. G. An introduction to the theory and measurement of influence. American political science review, 1955, 49, 431-451.

McLaughlin, B. Incidental learning and Machiavellianism. Journal of social psychology, 1970, 82, 109-115.

Miller, G. R. and Steinberg, M. Between people. Chicago: Science Research Associates, 1975.

Mischel, W. Toward a cognitive social learning reconceptualization of personality. Psychological review, 1973, 80, 252-283.

Morris, C. W. Signs, language and behavior. New York: Prentice-Hall, 1946.

_____. Writings on the general theory of signs. The Hague, Mouton, 1971.

Scheidel, T. M. Evidence varies with phases of inquiry. Western journal of speech communication, 1977, 41, 20-31.

Schur, E. M. Law and society. New York: Random House, 1969.

Seibold, D. R. and Steinfatt, R. M. Game theory and the study of human communication. A paper presented at the Speech Communication Association Convention, Chicago, December, 1974.

Steinfatt, R. M. The prisoner's dilemma and a creative alternative game: The effects of communication under conditions of real reward. Simulation and games, 1973, 4, 384-409.

Steinfatt, T. M. and Miller, G. R. Communication in game theoretic models of conflict. In G. R. Miller and H. W. Simon (Eds.), Perspectives on communication in social conflict. Englewood Cliffs: Prentice Hall, 1974.

_____, Seibold, D. R., and Frye, J. K. Communication in game simulated conflicts: Two experiments. Speech monographs, 1974, 41, 24-35.

Young, R. W. and Hurt, H. T. The effects of Machiavellianism and message channels on attitude change and satisfaction ratings. A paper presented at the International Communication Association Convention, April, 1973.

APPENDIX A

MACH IV SCALE

READ EACH STATEMENT CAREFULLY - then indicate the extent to which you agree or disagree by darkening in the corresponding number from the following choices;

1 = Agree Strongly
2 = Agree Somewhat
3 = Agree Slightly
4 = Disagree Slightly
5 = Disagree Somewhat
6 = Disagree Strongly

Work quickly and remember that first impressions are usually best in these matters. Please give your opinion on each statement.

STUDENT NUMBER

SEX

1 2

1. Never tell anyone the real reason you did something unless it is useful to do so.
2. The best way to handle people is to tell them what they want to hear.
3. One should take action only when sure it is morally right.
4. Most people are basically good and kind.
5. It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.
6. Honesty is the best policy in all cases.
7. There is no excuse for lying to someone else.
8. Generally speaking, men won't work hard unless they're forced to do so.
9. All in all, it is better to be humble and honest than to be important and dishonest.
10. When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which carry more weight.
11. Most people who get ahead in the world lead clean moral lives.
12. Anyone who completely trusts anyone else is asking for trouble.
13. The biggest difference between most criminals and other people is that the criminals are stupid enough to get caught.
14. Most men are brave.
15. It is wise to flatter important people.
16. It is possible to be good in all respects.
17. Barnum was wrong when he said that there's a sucker born every minute.
18. It is hard to get ahead without cutting corners here and there.
19. People suffering from incurable diseases should have the choice of being put painlessly to death.
20. Most men forget more easily the death of their father than the loss of their property.

APPENDIX B

INSTRUCTIONS TO SUBJECTS

Instructions

The game you are to play is very simple. Read the instructions below very carefully. After the game begins the experimenter will not answer any questions.

There are two players: P and O. You are player_____.

The game is played using a game matrix (there is an example below). In order to score points each player must choose a payoff-letter. Player P may choose either A or B and player O may choose either C or D. The game matrix is divided into four parts for scoring purposes. Each player's score is determined by both players' decisions. If player P chooses the payoff-letter A and player O chooses the payoff-letter D, their scores will be found in the lower left hand square of the game matrix. Using the example below player P would have a score of -2 and player O would have a score of 3.

There are 10 scoring rounds to a game. A round consists of a one minute-thirty second study/discussion period and a thirty second decision/scoring period. Points are scored during the thirty second decision/scoring period. During the one minute-thirty second study/discussion period, you may communicate freely with the other player, but you cannot receive any points. In order to score points during the thirty second decision/scoring period you must write your choice of payoff-letters upon the pad in front of you upon the table and share that information with the other player. When you have exchanged information with the other player, examine the matrix to determine your score for that round and write your score on the appropriate place upon the scorepad. You will receive no score for a round if you mark your decision prior to or after the thirty second decision/scoring period. The experimenter will notify you of the beginning of the thirty second period by holding up a sheet of paper with 30 seconds written on it. A whistle will be blown to signal the end of the thirty second period.

The game matrix to be used in this study is face down in front of you. Do not turn it over until instructed to do so. It is different from the example. You will use the same matrix for all 10 rounds of the game. If you have any questions, ask them now! If you have no questions, return this sheet to the experimenter.

Remember you can only mark decisions and receive points during the 30 second period. Feel free to communicate with the other player, but do not talk to the experimenter once the game begins.

	A	B
C	P = 1 O - 1	P = 4 O = -4
D	P = -2 O = 3	P = 3 O = 5

APPENDIX C

INSTRUCTIONS TO JUDGES AND SAMPLE TRANSCRIPTS

People take turns talking in conversations. The amount of speech encoded during turns varies. A turn in conversation may consist of 1 or more complete utterances. An utterance is the conceptual equivalent of the sentence in written language. However utterances are not sentences. They are often only meaningful within the context of the conversation in which they occur. An utterance is the minimum linguistic unit which can stand as a turn in conversation. Speaker change tends to occur at the end of utterances. True interruptions and overlapping tend to occur infrequently in most conversations.

Your task will be to judge the number of utterances that are present in a number of transcripts of conversations that I have made. The transcripts consist of the conversation between 2 people who are playing a game (the game will be explained after you have read these instructions in order to provide you with contextual information that may be necessary to make judgements). In the transcripts all of the turns of the first person to speak are underlined. The first word of each speaker's turn is capitalized and an asterisk follows the last word of each speaker's turn. Contractions are indicated by apostrophes and incomplete words are followed by a dash. No other punctuation is provided.

Guide Lines

Before making any judgements read the entire transcript. Then begin with the first complete turn of the first speaker. Always take into consideration the speech of the preceding and succeeding speaker. Mark the transcripts in the following manner. Place a line behind the last word of each utterance in the transcripts. It is possible that a few true interruptions appear in the transcripts you will be judging. If an utterance is incomplete (interrupted) circle the last word of the incomplete utterance. If the incomplete utterance is completed during a succeeding turn by the same speaker draw a line from the point of interruption to the first word of the speakers next turn. Do not draw the line through the speech of the other speaker.

You will judge 10 or 11 transcripts in addition to those used for training. Work at your own pace and work carefully. Feel free to take breaks whenever necessary. But please don't discuss the transcripts until all judging is completed.

Jones and Brunsman

You know so i get 4* Okay hmm i see how it's working now* What you got you put down a minus 8 don't you* Yeah* I guess it's just kind of a reaction game you know what you put down* Right we're we're playing back off each other right so there isn't let's see* Excuse me* Hmm i don't know what to think about this now i got confused* Here we go* We mark* Yeah* C this time i guess we got to figure out how to one of us can win and the other one get a dollar or 2 you know from it* Well i don't know how anyone is gonna win it you know actually c and a we both get 4 you know really anybody who gets that 20 points man you know it's gonna add up fast* Uhhuh* You know if you i wonder how he's designed that so that you can pull out a 20 on it* Wll if i choose d and you choose b since i've a* Yeah Yeah that's true* How do you want to do it* You know that's really weird like i can take all of the lowest i'll get is a minus 2* Uhhuh* The lowest you'll get is a minus 8 so i can blow it you know but* Let's see as it is* Man that is really weird if you choose d i choose b we both lose at the same time* Same time* I guess we just fool around* No we don't if i if i choose d and you choose b i get the 20 and you get the minus 2 if i choose d and you choose a like we did a while ago* Yeah* Then i get the minus 8* Yeah* and the most points you can get is 4 points* Yeah* In one way* Kind of stuck* Tell you what you uh give me your uh b decision and i'll take the d and i'll give you uh 7 and one half out of the 15* Wow that's a lot man* Can't beat that* You gonna go that way* Well i'm i'm gonna go d because you know somebody's gonna have to win* You want to do it that way* Well it's up to you if you know so however you want to mark it* Well yeah i go a b*

Gray and Knox

I don't know though i don't know we're wasting a minute and a half here* Yeah* Shucks there's nothing i can do to score more than 4 points though* Well okay* Well* C* Okay i put d* 4* What for* What* What'd you do that for alright since there's no chance in me winning anything even though i did mess up on the second round i can't do much more than lose anyway so the only thing i can do is give it all to you and hope you come out on top at the end of this okay* It's fine with me* It's fine with me you don't mind winning do you* Oh i guess not* Why do you keep looking over there anyway* Okay* Stalemate all the way down i could deceive you though and put a every time i guess i i shouldn't or i wouldn't or you'd have to trust me 1 of the 1 of the 2 hmm* Okay i put uh d* I put b* Got a 20 uh a negative 2* Well i'm even right now anyway* Oh gee wonder if you get anything for the lowest score* I don't know*

APPENDIX D

STATISTICAL TABLES

TABLE 1

PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN PLAYERS FOR DEPENDENT VERBAL BEHAVIORS

Variable	r	Variable	r
Total Words	.320	Feedback Cues	.306
Total Utterances	.370	Self-reference Pronouns	.300
Nouns	.146	Modified Verbs	-.146
Nouns with Sensory Referents	.081	Unmodified Verbs and Nouns	.080

TABLE 2

ANCOVAR FOR TOTAL WORDS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	9437.609	1	9437.609	0.932	0.99
Main Effects					
Collusion (C)	2834.871	1	2834.871	0.280	0.99
Power (P)	1631.669	1	1631.669	0.161	0.99
Interaction					
C x P	1361.349	1	1361.349	0.134	0.99
Error	374506.937	37	10121.809		

TABLE 3

ANCOVAR FOR TOTAL UTTERANCES

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	350.456	1	350.456	1.011	0.32
Main Effects					
Collusion (C)	193.497	1	193.497	0.558	0.99
Power (P)	168.193	1	168.193	0.485	0.99
Interaction					
C x P	241.454	1	241.454	0.696	0.99
Error	12829.922	37	346.755		

TABLE 4

ANCOVAR FOR NOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	0.001	1	0.001	0.269	0.99
Main Effects					
Collusion (C)	0.000	1	0.000	0.019	0.99
Power (P)	0.000	1	0.000	0.083	0.99
Interaction					
C x P	0.003	1	0.003	1.186	0.28
Error	0.090	37	0.002		

TABLE 5

ANCOVAR FOR NOUNS WITH SENSORY REFERENTS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	0.001	1	0.001	0.547	0.99
Main Effects					
Collusion (C)	0.002	1	0.002	0.846	0.99
Power (P)	0.000	1	0.000	0.116	0.99
Interaction					
C x P	0.005	1	0.005	1.985	0.16
Error	0.096	37	0.003		

TABLE 6

ANCOVAR FOR MODIFIED NOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	0.001	1	0.001	1.137	0.29
Main Effects					
Collusion (C)	0.000	1	0.000	0.030	0.99
Power (P)	0.004	1	0.004	3.572	0.06
Interaction					
P x C	0.000	1	0.000	0.070	0.99
Error	0.038	37	0.001		

TABLE 7

ANCOVAR FOR FEEDBACK CUES

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	6.415	1	6.415	0.163	0.99
Main Effects					
Collusion (C)	34.678	1	34.678	0.883	0.99
Power (P)	24.780	1	24.780	0.631	0.99
Interaction					
C x P	66.696	1	66.696	1.699	0.20
Error	1452.653	37	39.261		

TABLE 8

ANCOVAR FOR SELF-REFERENCE PRONOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	0.005	1	0.005	1.853	0.18
Main Effects					
Collusion (C)	0.005	1	0.005	1.902	0.17
Power (P)	0.000	1	0.000	0.020	0.99
Interaction					
C x P	0.000	1	0.000	0.108	0.99
Error	0.104	37	0.003		

TABLE 9

ANCOVAR FOR MODIFIED VERBS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	0.000	1	0.000	0.214	0.99
Main Effects					
Collusion (C)	0.000	1	0.000	0.023	0.99
Power (P)	0.003	1	0.003	3.301	0.07
Interaction					
C x P	0.000	1	0.000	0.214	0.99
Error	0.034	37	0.001		

TABLE 10

ANCOVAR FOR UNMODIFIED VERBS AND NOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Covariate					
Machiavellianism	0.002	1	0.992	0.191	0.99
Main Effects					
Collusion (C)	0.010	1	0.010	1.116	0.30
Power (P)	0.050	1	0.050	5.625	0.02
Interaction	0.045	1	0.045	5.062	0.03
Error	0.327	37	0.009		

TABLE 11

ANOVA FOR NOUNS WITH SENSORY REFERENTS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.000	1	0.000	0.010	0.99
Power (P)	0.003	1	0.003	1.000	0.325
Interaction					
C x P	0.005	1	0.005	1.970	0.17
Error	0.098	38	0.003		

TABLE 12

UNADJUSTED GROUP MEANS FOR DEPENDENT VERBAL BEHAVIORS

Variable	Collusive Dyads Player P	Collusive Dyads Player O	Non-Collusive Dyads Player P	Non-Collusive Dyads Player O
*Total Words	190.73	185.91	190.80	209.90
*Total Utterances	46.00	42.18	43.20	48.4
*Nouns	0.216	0.189	0.186	0.192
Nouns with Sensory Referents	0.172	0.149	0.130	0.132
Modified Nouns	0.094	0.072	0.097	0.070
Feedback Cues	13.36	10.55	10.90	13.10
Self-reference Pronouns	0.195	0.211	0.162	0.166
Modified Verbs	0.058	0.090	0.069	0.094
**Unmodified Verbs and Nouns	0.452_{ab}	0.421_{a}	0.365	0.465_{b}

*All tests of significance resulted in decisions to retain the null hypothesis.

**Cell means with common subscripts are not significantly different at the p.05 level. Comparisons were made using Duncan's Multiple Range Test.

TABLE 13

ANOVA FOR MODIFIED NOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.000	1	0.000	0.001	0.99
Power (P)	0.006	1	0.006	5.961	0.02
Interaction					
C x P	0.000	1	0.000	0.060	0.99
Error	0.039	38	0.001		

TABLE 14

ANOVA FOR FEEDBACK CUES

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.022	1	0.022	0.001	0.99
Power (P)	1.929	1	1.929	0.050	0.99
Interaction					
C x P	65.953	1	65.953	1.718	0.20
Error	1459.068	38	38.397		

TABLE 15

ANOVA FOR SELF-REFERENCE PRONOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.007	1	0.007	2.548	0.12
Power (P)	0.001	1	0.001	0.318	0.99
Interaction					
C x P	0.000	1	0.000	0.090	0.99
Error	0.109	38	0.003		

TABLE 16

ANOVA FOR MODIFIED VERBS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.000	1	0.000	0.464	0.99
Power (P)	0.009	1	0.009	9.892	0.003
Interaction					
C x P	0.000	1	0.000	0.227	0.99
Error	0.035	38	0.001		

TABLE 17

ANOVA FOR UNMODIFIED VERBS AND NOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.005	1	0.005	0.588	0.99
Power (P)	0.010	1	0.010	1.172	0.29
Interaction					
C x P	0.044	1	0.044	5.137	0.03
Error	0.329	38	0.009		

TABLE 18

ANOVA FOR UNMODIFIED VERBS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.001	1	0.001	0.156	0.99
Power (P)	0.003	1	0.003	0.770	0.99
Interaction					
P x C	0.022	1	0.022	5.031	0.03
Error	0.17	38	0.004		

TABLE 19

ANOVA FOR UNMODIFIED NOUNS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.002	1	0.002	0.904	0.99
Power (P)	0.002	1	0.002	0.842	0.99
Interaction					
C x P	0.004	1	0.004	1.773	0.19
Error	0.080	38	0.002		

TABLE 20

GROUP MEANS FOR ADDITIONAL VERBAL BEHAVIOR VARIABLES

Variable	Collusive Dyads		Non-Collusive Dyads	
	Player P	Player O	Player P	Player O
*Unmodified Verbs	0.331_a	0.305_a	0.276_a	0.343_a
Unmodified Nouns	0.122	0.117	0.089	0.122
Verb Modifiers	0.116	0.131	0.124	0.118
*Noun Modifiers	0.275_a	0.273_a	0.336	0.242_a

*Cell means with common subscripts are not significantly different at the p.05 level. Comparisons were made using Duncan's Multiple Range Test.

TABLE 21

ANOVA FOR VERB MODIFIERS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.000	1	0.000	0.055	0.99
Power (P)	0.000	1	0.000	0.128	0.99
Interaction					
C x P	0.001	1	0.001	0.595	0.99
Error	0.073	38	0.002		

TABLE 22

ANOVA FOR NOUN MODIFIERS

Source of Variation	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Collusion (C)	0.002	1	0.002	0.694	0.99
Power (P)	0.022	1	0.022	6.161	0.02
Interaction					
C x P	0.022	1	0.022	6.247	0.02
Error	0.136	38	0.004		