STRATEGIES UNDER NON-TRANSFERABLE UTILITY: AN EXPERIMENTAL STUDY OF THE EFFECTS OF DIVISIBILITY OF PAYOFF, COGNITIVE COMPLEXITY, AND MACHIAVELLIANISM ON STRATEGY SELECTION IN A MIXED MOTIVE GAME

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ABSTRACT

STRATEGIES UNDER NON-TRANSFERABLE UTILITY: AN EXPERIMENTAL STUDY OF THE EFFECTS OF DIVISIBILITY OF PAYOFF, COGNITIVE COMPLEXITY, AND MACHIAVELLIANISM ON STRATEGY SELECTION IN A MIXED MOTIVE GAME

Game-theoretic treatments of political decision processes typically assume that the payoff of a decision is homogeneous and infinitely divisible. This assumption permits the transfer of goods to which the analytical concept "utility" may be applied. This study explores strategies that may be selected in a mixed-motive situation constructed with either easily divisible payoffs or relatively indivisible payoffs.

Recent studies of strategy selection (e.g., Riker, 1967) have contended that personality or individual differences do not have a significant effect on processes relevant to political strategy selection. A more general question, however, has been raised (Greenstein, 1967); Under what conditions do individual differences account for political behavior? The mixed-motive situation used in this study systematically controls conditions in which differential strategy patterns might be predicted from individual difference measures of attitudes or skills supposedly related to strategic behavior.

Studies by Cole (1969), Phillips and Nitz (1968) and Nitz and Phillips (submitted for publication, Journal of Conflict Resolution) indicate that the probability of executing a strategy choice and the ease of divisibility of the payoff elicit differential strategies in mixed-motive situations. In this study a mixed-motive coalition game known as the "political convention paradigm" presented subjects with a finite set of strategy options

as they played the roles of faction leaders in two mock political party conventions. Each subject played the role of a faction leader faced with one opponent who could muster an equal number of convention votes and one opponent who could control a greater number of votes. The subject also played the role of a "stronger" contender in a game with two large, equal factions and one small faction. Four explicit strategies were defined on the basis of the subject's joint choices in the two types of games and the divisibility of payoff: Maximization, Competition, Security and Intra-coalition Compatibility. The following hypotheses were examined:

1. Subjects seek to maximize their share of the payoff with respect to their coalition partners, regardless of the probability of winning or the ease of divisibility of the payoff.

2. Subjects seek to form coalitions in which the division of the payoff can be negotiated with a minimum of intracoalition friction. When the payoff is only unequally divisible, the probability of choosing the unequal contender is higher than when the payoff is easily divisible. When the payoff is easily divisible, no intracoalition incompatibility is engendered in a coalition between unequals, so the maximization decision rule is used.

3. Subjects seek to form coalitions that will allow maximum grounds for conflicts, that is, coalitions for which the payoff structure of the game suggest no obvious division of the payoff.

4. When the payoff to a coalition can be obtained only with some probability less than unity, subjects will seek to maximize their chances of winning by forming the largest coalition possible.

Twenty-seven triads of male college students were run in each of three experimental payoff conditions: easily divisible-certain (Here the payoff was 100 patronage positions at a mid-term party convention); indivisible-certain (The payoff was nomination for either the governorship or lieutenant governorship in a one-party state); and indivisible-uncertain (Nomination for governorship or lieutenant governorship in a two-party state).

Hypothesis 1, Maximization, and 2, Intracoalition Compatibility were confirmed, substantiating the initial findings of Phillips and Nitz (1968) and Nitz and Phillips (submitted for publication) that indivisibility of payoff tends to elicit strategies that seek to reduce conflict over payoff division.

Harvey's (1961) conceptual systems theory defines four rank-ordered modes of processing information that would be expected to affect decision-making behavior. Persons with the more cognitively complex information processing skills would be expected to reject irrelevant social cues and select more task-related maximization strategies than persons with less cognitively complex information processing patterns. Tuckman's (1964) Interpersonal Topical Inventory was used to identify subjects in each complexity level. A factorial partition of contingency tables was used to analyze the effect of complexity differences on strategy selection. The hypothesis relating complexity level to strategy selection was disconfirmed. The most complex and the third-most complex of the four groups, however, performed according to the prediction for the more complex persons. The second-most complex and the least complex groups selected strategies predicted for the less complex subjects. Moreover of the most and third-most complex groups of subjects, those who picked Maximization strategies perceived their opponents as likely to demand less than half of the payoff. Revisions of conceptual systems theory were suggested.

Christie's (1962) Machiavellian is expected to select strategies that maximize either payoff (regardless of conditions) or conflict. No strategy choices could be predicted with the dichotomous classes of subject scoring above and below the median Mach V score. A post-hoc discriminant function analysis, however, was able to discriminate Maximization from Competition,

Security and Compatibility; Security from Compatibility; but was not able to discriminate Compatibility from either Competition or Security. The extremely strong degree of association of the predicted by observed contingency tables for strategies ($X^2_{9df} = 73.09$) as well as the discrimination among strategies with only four Mach V items in the discriminant function equations ($X^2_{9df} = 27.86$; $.005 > p > .001$) indicates that the Mach items can effectively predict strategy selection in an abstract game, but not if they are taken as an additive scale. The high level of discrimination obtained among the discrete abstract strategies defined across different payoff conditions in the political convention game suggested that it may be inappropriate to assume that any particular attitude scale should predict political behavior across situations. This study suggested that it may be fruitful to examine those skills that permit a political actor to select strategies appropriate to the particular situation; i.e., that permit discrimination among strategic situations.

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Chapter 1

Introduction

If the process of forming a coalition to effect a political decision is conceptualized as an n-person game, we would expect the mathematical theory of n-person games to shed some light on the strategies that would be in some sense "rational" in the game. Luce and Raiffa (1957) note that the mathematical work on n-person games has generally assumed that "in addition to receiving the payoffs prescribed by the rules of the game, the players are permitted to make additional transfers...." This provision for side-payments generally subsumes the much stronger condition "that utility is unrestrictedly transferable". (Luce and Raiffa, 1957). This assumption about utility (or in actuality, goods to which individuals ascribe value) requires the additional supposition that:

> there exists an infinitely divisible, real, and desirable commodity (which for all the world behaves like money) such that any reapportionment of it among players results in increments and decrements of individual utilities which sum to zero according to some specific set of utility scales for the players. This can happen when money exists, provided that each player's utility for money and that the zero and unit of each utility function is so chosen that the conservation of money implies the conservation of utility. When else it can realistically happen is obscure. (Luce and Raiffa, 1957, p. 168)

Luce and Raiffa (1957) argue that the assumption of transferable utility is not essential to n-person game theory and that a solution function can be defined without it. Their discussion is roughly as follows: Suppose there is a lottery whose prizes are bundles of goods, services, obligations, etc. The bundles accrue to each possible winning coalition as a whole. Let C(S) denote the commodity bundle accruing to the coalition S and let J(S) denote the set of all possible physical

distributions, T, of C(S) over the members of S. A coalition S is defined to be effective for a set of utilities $X=(x_1, x_2,.....x_n)$, where n is the number of actors in S, if there exists at least one distribution, T, in the set J(S) such that the utility of T is less than x_i for all players i in the coalition S.

The set of utilities $Y=(y_1, y_2,...y_n)$ is said to dominate the set of utilities $X=(x_1, x_2,...x_n)$ if there exists a non-empty coalition S such that S is effective for Y and $y_i > x_i$ for all i in S. Under these conditions, S is a solution for the game.

Luce and Raiffa (1957) point out the critical mechanical problem of making side payments in units of indivisible physical commodities. Suppose the joint payoff to the coalition $S_1=\{1,2\}$ is $C(S_1)=\{A,B,C\}$, where A, B, and C are non-homogeneous, indivisible goods like a house, a painting and a car. If player 3 were to join S_1 to form $S_2=\{1,2,3\}$ the payoff might be $C(S_2)=\{D,E\}$, where D and E are also non-homogeneous, indivisible goods such as a yacht and an antique oriental chest. The monetary equivalents for the commodities A, B, C, D, and E may differ from person to person. So long as no external market mechanism is available, there is no apparent method either S_1 or S_2 may employ to divide the payoff. Nor is there a clear way to decide whether it is profitable to add another player. One means of circumventing this problem is by aggregating payoffs--either by bringing a number of small issues into the negotiations, or by contributing some divisible resource, such as money, to a common pot. Luce and Raiffa (1957) note that the problem of indivisible payoffs has neither been attacked directly, nor has it been approached through systematic development of a theory of aggregation.

This study attacks the problem of predicting strategy choices in games in which payoffs may not be infinitely divisible. The focus of the present

study, however, is not the mathematical derivation of ideal solution sets, but is rather the empirical examination of the effect of nontransferable utility on the strategies different subjects select. The remainder of this introductory chapter will note several significant studies of coalition strategy that have contributed to the general design of the present research. The chapters to follow will examine several studies in detail, derive empirical hypotheses, construct a test situation, and present the findings of the study.

Caplow (1959) was the first empirically oriented social scientist to investigate the problem of strategies in games with non-transferable payoffs. He defined three kinds of competitive environments: continuous, in which the rewards of the coalition process lie in the activities of forming the coalition, as in competitive social games; episodic--in which the rewards are distributed periodically to the coalition in control at predetermined distribution times; and terminal--in which the distribution of rewards permanently ends the game, e.g., by destroying one or more actors or by establishing an equilibrium condition.

In postulating three different strategies, Caplow (1959) made two implicit assumptions. The first was that all persons perceived the situation in the same way. The second was that all persons who perceived the situation in a given way would select the same strategy. Caplow's (1959) assumptions have been implicit in much contemporary research on coalition formation. (e.g., Gamson, 1961a, Riker, 1967).

One of the first political scientists to develop a formal coalition theory, William Riker (1962) also makes qualitative distinctions among types of payoff. Riker (1962) identifies one set of rewards as particularly appropriate to followers, and another set as constituting the principal reward of leaders. His distinctions, though, do not lead to

predictions of different strategies. Riker (1962) derived one strategy from a strictly deductive analysis of the n-person zero-sum game. This strategy assumes an infinitely divisible payoff. All rational subjects are not expected to perceive the payoff situation in the same way but they are expected to select the same strategy. Riker (1962) contends that an actor reaches a strategy decision only by comparing offers tendered with his own preferences and its subjective estimation of his opponent's preferences and alternatives. He claims generality for this approach since the estimation assumption frees him from the necessity of postulating interpersonal comparisons of utility. In the derivation of the "size principle", which postulates that rational actors will choose to form the smallest winning coalition, Riker (1962) examines a situation in which a larger-than-minimal winning coalition might form. If it is possible to increase the total payoff more than proportionately by adding members to an already winning coalition, a larger than winning coalition might conceivably form. Riker (1962) examines four rules for payoff division in this situation, and finds that none of them lead to a stable coalition larger than the minimal winning coalition--if they lead to a coalition at all. The entire analysis, though, examines payoff distribution rules that operate only with infinitely divisible payoffs. Thus despite his disclaimer to the contrary, Riker (1962) limits his analysis to situations which have transferable utility.

Schelling (1960) argues that if a social situation is conceptualized as a mixed-motive game--that is, as a situation in which there is something to be gained by cooperation with some, but not all of the participants--then

it is not possible to construct a totally deductive theory of coalition strategy. Cues in the environment that may be independent of the abstract characterization of the situation's payoffs may suggest strategies to actors that would permit them to coordinate their activities. Moreover, some empirical knowledge of how the actors assessed their opponent's responses to such cues is necessary to a viable theory of strategy selection (Schelling, 1960). This argument takes the individual actor's perceptions of the competitive situation as essential elements of a theory of coalition strategy. Schelling's (1960) approach would suggest that intangible goods such as agreement on ideological stands, or particular sensitivity of individual actors to certain outcomes or particular prominence of specific payoff divisions, would be likely to have cue value to the actor formulating a strategy--even if neither the actor nor an outside observer could assign an exchange value to the good or situation element that provided the cue.

Riker (1967) provides a contrast to Schelling's (1962) position in this introduction to an experimental study of bargaining in a three-person mixed motive game:

> The scientific expectation is that, by studying the quasi-political action of games--where the variations among institutional, psychological, and ideological components of the behavior are minimized--one will be able to understand more profoundly the basic political activities of bargaining, forming coalitions, and choosing strategies. This more profound understanding is a consequence of obtaining answers to the following questions: (1) What is the mathematical solution, that is, what amount of utility can players be expected to obtain, when it is assumed that players are rational and wish to maximize utility? (2) What is the strategy (or method of playing) that will ensure players of achieving the solution? (Riker, 1967)

Riker (1967) found that the mean payoff to players in each playing position was not significantly different from the mathematical solution of the game. He also found that those participants who "undersold" them-

selves in bargaining, that is, those who offered their opponents a larger share of the payoff than the opponent could expect to obtain in any other coalition, won significantly more games than did participants who offered less to the opponent and demanded more of the payoff for themselves.

Participants tended to change their offers as they played different positions in the game, and players from different social backgrounds did differ in bargaining strategy or amount won (Riker, 1967). Riker (1967) concludes his study with the following remarks:

> It is often suggested that the outcomes of political events are determined by the psychological or sociological characteristics of the participants. Such considerations seem inconsequential in these experiments where quite different kinds of subjects behaved in substantially identical ways and where the same subjects behaved differently in different positions . . . subjects did not let their psychological predispositions toward high or low aspirations or high or low feelings of dominance (or whatever else might be said to force them to behave similarly in different positions) affect their judgement on the choice of a strategy . . . I conclude that the crucial determinants of behavior are the subjects' (conscious or unconscious) recognition of the abstract solution and the strategy dictated by the temporal circumstances.

It should be noted that Riker (1967) reports no individual difference measures on his subjects other than their social group identification as political science students, randomly selected students, or businessmen in evening college. Moreover, Riker's (1967) experiment used only one form of abstract game and a monetary payoff--thus there was only one abstract solution.

The contrast between Riker's (1967) argument and Schelling's (1960) approach can be sharpened by examining one of the principal objections to the study of the effects of personality on political behavior:

> Personality is not an important determinant of behavior because individuals with varying personal characteristics behave similarly when placed in common situations. And it is not useful to study personal variation, if the ways in which people vary do not affect their behavior. (Greenstein, 1967)

Greenstein's (1967) critical review of this sort of objection rephrases it in terms amenable to scientific examination:

> Under what circumstances do different actors (placed in common situations) vary their behavior, and under what circumstances is behavior uniform?

Two sorts of questions may be asked with this proposition in mind. The first deals with characteristics of the environment that may facilitate or hinder personal variability. Sherif (1953) notes that ambiguous situations tend to leave room for personal variability. Budner (1962) elaborates the concept of ambiguity to include those environments which are completely new and offer no familiar cues, those which are complex and provide a great number of cues, and those which provide contradictory cues. Greenstein (1967) suggests the following proposition relating personality effects to environmental differences:

> The opportunities for personal variation are increased to the degree that political actors lack mental sets which might lead them to structure their perceptions and resolve ambiguities.

The second sort of question one might ask to ascertain the conditions under which individual differences might lead to differential behavior is, "What kinds of individual predispositions are sensitized by various situations? What kinds of skills do different situations draw upon?" These questions can be directed to those elements of the environment Budner (1962) held relevant to individual variation in behavior. What kinds of skills would be useful in a situation which is novel, complex or contradictory? What kind of predispositions would be sensitized by such a situation?

This study examines several theoretical contributions of the study of coalition behavior in the light of the effects of environmental and predispositional differences. It proceeds by (1) structuring a well

defined mixed-motive environment and postulating a set of strategies expected to be elicited by the environmental structure; (2) developing a set of systematic alterations in the environment and predicting the differences in strategy patterns resulting from environmental changes; and (3) postulating a set of strategy choices that would be expected of individuals with selected personal characteristics in specific environmental situations.

The Experimental Environment

The "political convention paradigm" has been used extensively as an experimental setting for testing hypotheses based on various theories of coalition formation behavior. The political convention paradigm was first used by Gamson (1961b). In it subjects are asked to take the roles of faction leaders or candidates in a political party convention. The purpose of the convention is to allocate an easily divisible payoff, such as a number of patronage positions or a relatively indivisible payoff such as the nomination to an office on the party's ticket. The subjects, as contenders, must garner a majority of the delegates' votes to gain effective decision power over the payoff distribution. Their activities consist of deciding whom to contact to begin negotiations with, negotiating, and arriving at some coalition agreement with an explicit division of the payoff. The political convention paradigm thus provides the opportunity to observe several forms of social and individual behavior. This study focuses on one phase of the individual's strategy: his selection of a potential partner with whom he will begin negotiations.

Abilities and Predispositions

The prospect that situations which are novel, complex, or contradictory may facilitate the use of particular kinds of skills suggests a

particular area of personality theory that may explain aspects of strategy selection behavior. Harvey's (1963) work with conceptual systems theory deals directly with skills essential for handling complex situations. Harvey, Hunt, and Schroder (1961), Harvey (1963), and Schroder, Driver and Streufert (1967) developed a theoretical scheme that postulates that the ability to deal with large amounts of complex or contradictory information is a basic individual skill. Individuals who can integrate large quantities of information and make accurate discriminations can generate more alternative conceptions of possible outcomes in a situation and can anticipate a larger number of consequences of different strategies. These persons are called cognitively complex. They have been found to be successful in several forms of strategy games (Schroder, Driver and Streufert, 1967). Persons who lack these abilities are more limited in their strategy perceptions and thus exhibit more rigid and invariate strategy choice. The contribution of conceptual systems theory to the prospect of determining the conditions under which different situations will elicit different strategies is examined in this study.

The possibility that different competitive environments might sensitize different predispositions or attitudes suggests that one would do well to examine some set of attitudes that are theoretically related to strategic behavior. The concept of the Machiavellian refers to the individual who has skill in interpersonal strategy and has no scruples about using it to his own advantage. Christie describes the ideal Machiavellian[1] as follows:

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[1]The development of an objective scale to measure Machiavellianism was initiated by an informal workgroup at the Center for the Advanced Study of the Behavioral Sciences in 1953-54. The group consisted of Robert Agger, Richard Christie, Bruce Melnik, and Frank Pinner. (Christie, 1962)

(1) He is not basically concerned with morality in the conventional sense.

(2) He is basically "cool" in the interpersonal relationships--once one becomes emotionally involved with another person it is difficult to treat him as an object manipulated.

(3) Since those who manipulate are more concerned with means than with ends, he might be of any ideological persuasion, but is more concerned with conning others than with what he is conning them for.

(4) He functions successfully in the contemporary world. He is not likely to display signs of irrationality viewed as neurotic or psychotic, but is more likely to be overly rational in dealing with people. (Geis and Christie, 1965)

The Machiavellian might be expected to be sensitized by situations which offered a number of strategies for dealing with the environment at hand. Moreover, he might be especially sensitive to those strategies which others might avoid because of questions of the "fairness" or "rightness". This study examines the effects of Machiavellianism in several competitive situations which provide such strategies as viable choices.

Implications for Political Theory

The study that follows attempts to integrate the major questions raised by two distinctly different arguments in modern political theory: One, the position that the abstract (mathematical structure of the competitive situation determines the participants' strategy choices; the other that the participants' perception of significant cues may lead actors to strategies not defined as mathematically optimal. The key to integrating these conflicting arguments is an examination of behavior in a situation which is characterized by non-transferable utility, i.e., indivisible payoff. Chapter II of this study reviews four competing theories of coalition formation, Minimum Power Theory, Minimum Resource Theory, Anti-Competitive Theory, and Utter Confusion Theory (Gamson, 1964). The

review poses a question suggested by Schelling's (1960) criticism of purely deductive approaches to theory of interaction in mixed-motive games: How do changes in the competitive environment alter the strategies chosen? This question provides a means of integrating the conflicting predictions of the four theories of coalition formation. Moreover in dealing with situations which may elicit alternative strategies, it becomes possible to ask if the perception and selection of specific strategies is in part the result of some particular skill or sensitization to the competitive situation.

Chapter II develops the theoretical basis for predicting alternate strategies in mixed-motive situations and Chapter III derives hypotheses predicting strategy selection from individual difference measures. Chapter IV restates the objectives of the study and develops the experimental design. Chapter V presents results and Chapter VI summarizes the findings of the study and briefly discusses their theoretical significance.

Chapter II

The Identification of Social Contact Strategies in The Political Convention Paradigm

The identification of "successful" strategies in mixed-motive games is generally contingent on the assumption of a particular theory of strategy behavior. This is most apparent in theories of "rational" choice, such as Riker's (1962) application of a game theoretic model to the study of political coalitions. Riker (1962) defines a rational choice as a strategy that would seek to build the smallest winning coalition. Any decision to form a coalition larger than necessary to win the contest at hand, unless it is made in ignorance of the necessary margin or size of the minimum winning coalition, is an irrational decision. In an empirical examination of a theory which assumes a single rationality it is meaningful to ask whether subjects or respondents chose rational strategies or not.

If the theoretical basis for a study of decision behavior postulates alternative strategies, that is, alternative goods that a participant may choose to maximize, then it makes little sense to ask whether subjects in the study are behaving rationally. It does make sense, however, to ask, "With respect to what decision rule are their decisions rational?" This study investigates several distinct patterns of strategy selection, each of which maximizes a somewhat different expected utility. Each strategy pattern is in this sense a rational pattern. The question we may then ask is, "Under what conditions do participants in a mixed-motive game select alternate rational strategies?"

This chapter reviews some of the empirical findings that have led to the development of the several theory fragments dealing with coalition formation process, Shelly and Phillips' (1966) distinction between two

phases of action in forming a coalition provides a useful analytic tool for the discussion to follow. They distinguished a temporally prior process in forming a coalition as the "social contact process" and a later phase as the "bargaining process". The contact process will receive principal attention in this study.

The social contact process is by no means a unitary event. There are at least two individual activities in the contact process. One is the individual's estimation of the demands other participants will make in bargaining. The other is the exercise of a decision rule to select one of the other participants to contact. Several studies have examined the contact process with major emphasis on decision rules (Chertkoff, 1966; Phillips and Nitz, 1968; Cole and Phillips, 1967; Nitz and Phillips, in preparation). Little previous research has examined the participant's evaluation processes. This study will provide initial data on the evaluative processes in the mixed-motive game.

Theoretical Background

Minimum Power Theory. Minimum Power Theory is derived from a game theoretic measure of power developed by Shapley (1953). The power of any participant in a mixed motive situation is measured by counting the number of ways he can turn a losing coalition into a winning one by joining it. The theory assumes that some decision rule that specifies the total amount of resources an actor or social unit must control in order to influence the distribution of payoff in the situation. For any mixed motive situation with a finite number of social actors and a fixed decision rule, it is possible to enumerate all possible orders of voting (i.e., joining a coalition) and count the number of times each actor holds the pivotal position. Shapley and Shubik (1954) have shown that any other internally consistent

measure of power in voting bodies must be a transformation of this one.

With Shapley and Shubik's (1954) simple algorithm for computing power, we can specify the relative power of each actor and the likelihood of his being the pivotal member of a coalition in a mixed motive situation. However, in a situation where resources are distributed as follows:

A= 4 votes B= 3 votes C= 2 votes

and a simple majority (5 votes) is required to win any contest, the Shapley-Shubik algorithm identifies two potential coalitions for each participant, such that either will become a winning coalition if it is formed. Thus the power of all participants is equal -- the probability of any participant forming a winning coalition is 1/3. In this sort of mixed motive situation where no participant has either dictatorial power or veto power, Minimum Power Theory predicts that all coalitions will form with equal likelihood.

So long as the probability of forming a winning coalition is equal for all actors, Minimum Power Theory neither suggests nor derives from any social contact strategy based on the payoff structure of the game. When the actors' chances of forming winning coalitions vary, though, Minimum Power Theory may suggest strategies based on order of play.

There has been little experimental support for Minimum Power Theory. Vinacke and Arkoff (1957), Vinacke (1959), Phillips and Nitz (1968), and Cole (1969), however, provide a convincing set of counter-examples. The one study (Kelley and Arrowood, 1960) that does not support Minimum Power Theory is based on an experiment that allows several confounding variables to be uncontrolled.

Anti-Competitive Theory

Anti-Competitive Theory was named by Gamson (1964) in his review of coalition formation literature. This theory assumes that participants in

a mixed-motive situation will attempt to minimize conflict or competition within an alliance by forming coalitions along lines of least resistance. The coalitions that form with least resistance will be between those participants for whom the distribution of resources suggests an obvious and unambiguous division of the payoff.[1] Gamson (1964) further specifies that "this will occur among players who are equal in resources, because . . . players with equal resources will share equally".

Two types of findings can be distinguished among studies supporting Anti-Competitive Theory. The first type consists of instances of anti-competitive behavior that arise through the play of the game. Hoffman, et al. (1954) found that achieving an early lead in a game where cumulative scoring was important was likely to stimulate opposition. Thus subjects found it advantageous to avoid taking a commanding lead early in the game.

Uesugi and Vinacke (1963) observed that females repeatedly attempted to transform a mixed motive game into a pure coordination game by rotating winners between plays and forming all-inclusive alliances. Chaney and Vinacke (1960) found that subjects high in achievement motivation were coalition members significantly less often than were those low on achievement motivation. Apparently the more highly motivated subjects presented the image of a fierce competitor and were therefore avoided.

The second type of evidence for Anti-Competitive Theory arises from the resource distribution and the formal structure in the game, rather than from the bargaining behavior occurring during the game play itself.

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[1] This is substantially the argument presented by Schelling (1960).

Willis (1962) found that an even distribution of resources between potential coalition partners tended to lead to the formation of more counter-coalitions in a four person game than did an unequal distribution of resources. Gamson (1961b) noted a prevalence of coalitions between participants with equal resources in a five man game under resource distribution conditions similar to those used by Willis.

Leiserson (1966) observed that his subjects divided a monetary payoff equally more often than any other way. He interprets this as division of payoff along the lines of least resistance--by virtue of the prominence of the strategy.[2] Nitz and Phillips (in preparation) further noted that subjects were less willing to form a coalition with a potential partner who had equal resources when the payoff was relatively indivisible. Under that circumstance the equal resource distribution cannot make it easier to agree on a division of the payoff.

This latter set of data suggests that a careful analysis of a limited set of structural variables, such as the resource distribution and the divisibility of the payoff may provide explanations for some of the behavior described as anti-competitive.

Minimum Resource Theory

Minimum Resource Theory evolved from the work of Caplow (1956), Vinacke and Arkoff (1957), and Gamson (1960, 1961a, b). The theory was explicitly formulated as a sociological theory of the coalition process by Gamson

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[2] I did not manage to secure a copy of Leiserson's (1966) Ph.D. dissertation until the work reported here was substantially complete. I shall touch on his research contribution more lightly than I might have had I examined his work before independently developing a parallel theoretical framework.

(1961a, 1964). Gamson (1961a) limits Minimum Resource Theory to mixed motive games where no participant has dictatorial or veto power. In a three-person game with participants A, B, and C, this would mean that the distribution of resources among the participants could not be

$$a > (B+C)$$

or

$$A = (B+C).$$

That is, no one contender (here arbitrarily designated "A") can have sufficient resources to control or block any decision. This exclusion of situations that have participants with dictatorial or veto power limits Minimum Resource Theory to situations which are essential games: Each participant has some stake in the outcome and some possibility of exercising control over that outcome.

Gamson (1961a) assumes that all participants have the same information about the initial resource distribution and payoff conditions. There is some class of payoffs among which they do not differentiate on the basis of payoff value, but among which they choose according to a "non-utilitarian" strategy.

These assumptions define an explicit set of situations for which the theory is appropriate. The first empirical hypothesis of Minimum Resource Theory is a statement of the goals or expectations the participant perceives others to have:

1. Any participant will expect others to demand from a coalition a share of the payoff proportional to the amount of resources which they contribute to the coalition.

This hypothesis has been referred to as the "parity norm" (Gamson, 1964). A succinct development of the notion of parity in interpersonal exchange is found in Homans' (1961) discussion of distributive justice:

> A man in an exchange relation with another will expect that the rewards of each man will be proportional to his costs--the greater the rewards, the greater the costs--and that net rewards or profits of each man will be proportional to his investments.... (Homans, 1961, pp. 75-77)

Gamson's (1961a) second hypothesis specifies a decision rule for the participant. It may be expressed in both general and specific forms, depending on the nature of the payoffs in the game and the relevance of non-utilitarian strategy choices. The more general form, which applies when the payoff to each possible coalition may differ is:[3]

> 2a. A participant will choose that coalition in which the product of the total payoff to the coalition and his expected share of that payoff is highest. He will not discriminate within payoff classes on the basis of his members have the highest mean rank in his evaluation of non-utilitarian preferences.

When the payoff to all coalitions is equal, hypothesis 2a may be rephrased as follows:

> 2b. When a player must choose among alternative coalition strategies where the total payoff to a winning coalition is constant, he will maximize his payoff by maximizing the ratio of his resources to the resources of the coalition. Thus he will favor his cheapest winning coalition.

The final prediction of the theory is:

> 3. A coalition will form if and only if there are reciprocal strategy choices between two participants. This hypothesis assumes that the coalition formation process proceeds in a pairwise manner.

An illustration of the theory's explicit predictions is found in Gamson's (1961b) study of coalition formation in the political convention paradigm. Gamson (1961b) constructed three political convention games and asked subjects from two local fraternities to play a series of the games. Two subjects from one fraternity and three from the other played in each

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[3]Hypothesis 2a and 2b are my wordings rather than Gamson's. I believe they convey the sense of Gamson's (1961a) propositions more explicitly than his original phrasing.

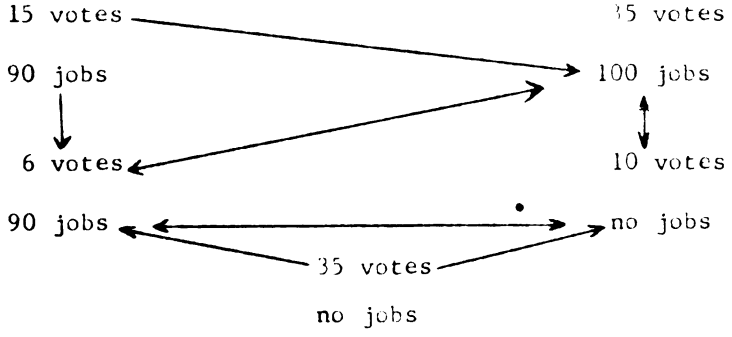
game. In one experiment the resources or votes were apportioned among five subjects in the following amounts: 17, 17, 17, 25, 25. The payoff in this convention was 100 political jobs that would be divided among the winning coalition. The non-utilitarian strategy preferences were established by composing each group of members from two different social fraternities. The effective decision point was taken to be a simple majority of the votes.

Since the payoff to all coalitions is the same in this convention, coalition preferences could be predicted on the basis of the initial resource distribution. The minimal winning coalition for all subjects is a coalition that includes two of the 17 vote contenders. When the cases in which both of a subject's pro-hypothesis choice options were members of the other fraternity were removed from the analysis, the choice hypothesis was confirmed. The minimum winning coalition was the alliance most often preferred by the three contenders with 17 votes each. The final coalitions formed as predicted one-third of the time (chance expectation was one-tenth).

In the second convention, both resource base and payoff to the coalition varied. The Minimum Resource Theory choice prediction are illustrated in Figure 2.1. (Gamson, 1960)

Figure 2.1

Minimum Resource Predictions in Gamson's Second Convention



The number of jobs the coalition was able to divide was the highest of the payoffs to the members, rather than the sum of the jobs available to the members if they should win.

In this convention the 6 and 10 vote participants made choices consistent with the prediction of the theory. The two 35 vote participants, however, chose each other more often than they chose any of the other contenders. None of the final coalition frequencies differed from chance expectancies. The latter two findings are contradictory to the prediction of Minimum Resource Theory.

Gamson (1960) suggests that this tendency of the contenders with greater resources to choose each other may be a strategy of risk-reduction. Forming any winning coalition on the first negotiating round may have been preferred to taking the chances involved in a series of negotiating rounds necessary to build a 3 member cheapest minimal winning coalition.

The results of Gamson's (1961b) first convention game tend to support Minimum Resource Theory. The results of the second game suggest that Gamson's empirical hypotheses capture only a portion of the substance of a viable coalition theory.

The three theoretical approaches discussed all appear to be faulted. Nonetheless, they provide a sufficient basis for formulating an integrated explanation of strategy selection.

Identification of Strategy Selection Propositions

The most fruitful place to begin an examination of unexplained strategy selection patterns is with the most clearly articulated theory fragment, Minimum Resource Theory. There are several ways in which Gamson's (1961a) Minimum Resource Theory hypotheses may not have been adequate for the task. The empirical hypotheses assumed (1) a particular distributive

justice expectation, (2) a specific maximization decision rule, and (3) required reciprocal choice as a prerequisite to coalition formation. In the experiment subjects chose partners until reciprocal choices were made, so no test of the latter hypothesis was possible. The subjects' evaluations or estimates of their opponents' expectations were not measured, but were inferred from their partner preference choices. Since the partner preferences did not confirm the theoretical predictions in Gamson's second experiment we must assume that either (1) the subjects did not entertain parity expectations, or (2) the subjects did not maximize according to the parity principle, or (3) both. Finally, Minimum Resource Theory predicts coalition outcomes on the assumption that all participants use the same decision rule and have the same estimate of other's expectations. This assumption is not upheld in Gamson's (1960, 1961b) second game.

The absence of any significant pattern in the coalitions formed in the second game, combined with consistent partner preferences in the opposite direction from the theoretical predictions challenges the adequacy of Minimum Resource as a sociological theory. The significant, though not necessarily pro-hypothesis, patterns of partner preferences in both the first and second games indicate that Gamson's (1960, 1961a) formulation may provide a model for a viable theory of strategy selection or individual choice in coalition formation situations.

Gamson's (1961a, 1961b) work suggests several elements of a strategy selection model. The first is a prediction that an individual will tend to hold a parity expectation:

> A. Any participant will expect others to demand from a coalition a share of the payoff proportional to the amount of resources which they contribute to the coalition.

Since little previous research on expectations and social judgments is directly related to coalition processes, I will not elaborate upon this hypothesis at this point. Its purpose is essentially exploratory in nature.

The second hypothesis suggested by Gamson's work is a modification of his maximization decision rule.

B1. Individuals seek to maximize their share of the payoff with respect to the coalition partners.

The remainder of this chapter will explore the effects of two factors that appear to be systematically related to coalition partner selection strategies; multiple resource dimensions and differential divisibility of payoff.

Multiple Resource Dimensions

Three studies of coalition processes involving multiple resource dimensions may suggest what sorts of mechanisms may contribute to a viable theory of individual choice in coalition formation. Chertkoff (1966) examined the effect that differing probabilities of success would have on coalitions formed in the political convention paradigm. The payoff or purpose of the convention was to award a nomination and to apportion 100 patronage positions among the coalition members. The distribution of votes among three contenders was 40-30-20. The distribution corresponds to Caplow's (1956) Type 5 resource distribution. The essential characteristic of the Type 5 distribution is that the resources be distributed among the contenders such that:

$$A > B > C$$

$$A < (B+C)$$

Here A represents the number of votes pledged to contender A; B, the number

pledged to contender B; and C, the number pledged to candidate C. The second resource dimension, the probability of winning the election if nominated, was also varied. Four conditions were used. In condition one the probability of winning the election was not introduced. In condition two each candidate had a probability of .50 of winning the election if he were nominated. In condition three contender A had a probability of .70, while contenders B and C had probabilities of .50 each. In condition four candidate A had a probability of .90 of winning the election if nominated, while contenders B and C had each probabilities of .50.

The bargaining period began only if two subjects made reciprocal choices. The subjects were allowed to bargain for a fixed period of time. If they reached no agreement within the time limit, the process of choice and bargaining was repeated until a coalition formed.

Chertkoff (1966) found that Minimum Resource Theory predictions of coalitions formed held for condition one, the condition with no probability manipulation. When the probability of winning was introduced, the frequency of BC coalitions decreased as the probability of A's winning the election increased. The BC coalitions were replaced by AB and AC coalitions. Stryker and Psathas (1960) and Kelley and Arrowood (1960) contend that misperception of the real power relationships in coalition situations generates the frequent coalitions observed between weaker contenders. Under Kelley and Arrowood's (1960) hypothesis the decrease in frequency of BC coalitions Chertkoff (1966) observed could be attributed to a "correction" of such a misperception of the power relationships.

An explanation of Chertkoff's (1966) data that does not resort the mechanism of subject error has been proposed by Cole (1969). Cole (1969) examined coalition formation in a truel (three person duel) under two conditions of certainty. In the deterministic condition, any attack

a coalition or an individual directed at an opponent was executed with a probability of 1.0. In a probabilistic condition, coalitions or individual actors were successful in their attacks with a probability of .50. Since no coalition in the probabilistic condition could be successful with certainty, no minimum winning coalition could be defined. To generate predictions comparable to those of Minimum Resource Theory, Cole (1969) suggested the following proposition:

> Participants in a probabilistic situation will prefer to form that coalition which will maximize their chances of winning.

Cole (1969) then predicted that the stronger contender would be the coalition choice preferred by all subjects in the probabilistic condition. The weaker contender would be the preferred coalition choice in the deterministic condition. Cole's (1969) first hypothesis was confirmed, while his second was not. He attributes subjects' choice of the stronger contender in the probabilistic situation to the operation of a desire for security. This desire is seen as a by-product of the same structure. It becomes salient when subjects cannot be certain of executing chosen game strategies (Cole, 1969).

Cole's (1969) concept of a desire for security is quite different from Homans' (1961) distributive justice and Gamson's (1960, 1961a) parity principle. The parity principle is an expectation the subjects have of others' desires. Cole's (1969) desire for security is actually a decision rule the subject uses to select a coalition partner. It would be consistent with this discussion to rephrase Cole's (1969) security norm as a decision rule alternative to the Gamson's (1961b) maximization rule:

> 2c. When the payoff to any coalition cannot be obtained with certainty, but only with some probability, individuals will seek to maximize their chances of winning by forming the coalition that will maximize that probability of winning.

> When the probability of winning is perceived as a function of the total weight or combined resources of the coalition members, persons will attempt to form the coalition with the greater resource weight.

Phrased in this way, the security rule describes a strategy found by Leiserson (1966), namely an urgency on the part of some subjects to get the benefits of a winning coalition no matter how small a share one had to accept.

Chertkoff (1966) noted that the contact process served as a sensitive indicator of a large portion of alliance forming behavior. In every position the probability of picking the weaker competitor was greater than the probability of picking the stronger. The difference from the null hypothesis $P(W) = .5$ was highly significant ($\chi^2_{df} = 18.32$, $p < .001$). Not all subjects, however, followed this Minimum Resource Theory strategy. A minority favored the stronger competitor. Several types of behaviors may be represented by these non-minimal winning coalition choices. The Kelley and Arrowood (1960) hypothesis is that these few subjects correctly perceived the real power of all three contenders to be equal and that the majority misperceived this power distribution. A positive hypothesis, though, can postulate a decision rule to explain this behavior.

Two possible explanations are suggested by these data. Each is consistent with a different interpretation of Gamson's (1964) Anti-Competitive Theory. First, the occurrence of a plurality of 35-35 coalitions may simply be an unintended consequence of the pair-wise negotiating procedure. Forming a three member coalition requires two rounds, forming a two-man coalition requires only one. A 35-35 coalition may simply be the result of mutual "security" strategies.

Gamson's (1961a, b) original study of the convention paradigm sheds some light on one sort of alternative decision rule that some subjects

may be using here. Gamson (1964) notes that the number of unexpected large 35-35 coalitions formed in his second game suggests that some form of anti-competitive behavior may have occurred. Second, coalitions between equally matched contenders suggests an obvious division of payoff--fifty-fifty. Schelling (1960) noted that psychologically salient outcomes may suggest distinct strategies. The saliency of some set of possible outcome allocations may affect subject's choices in this situation. The remainder of this chapter will review research developing this line of argument.

Phillips and Nitz (1968) conducted two studies of the decision rules used in the contact process that suggest an explicit set of alternate decision rules. The method used was a paper-and-pencil measure called the Political Decision Questionnaire, or PDQ. The PDQ has taken various forms, the first of which reads as follows:

> Assume that you are the manager for a candidate in a political party convention. There are a total of 300 votes among the delegates and at least a majority (151) of these are required to win the nomination. Your man, Candidate A, has ____ votes pledged to him. Candidate B has ____ votes pledged to him, and Candidate C has ____ votes pledged to him. Which of the other two candidates, B or C, will you approach first to try to make a deal? (Phillips and Nitz, 1968)

The following scheme was used to distribute the convention votes among the three candidates. The subject always played the role of the Faction A representative. One of the two remaining factions, B or C, was designated W, the weaker faction, and the other was designated S, the stronger faction. The subject always had the same number of convention votes as either W or S. The following relationships then existed in the resource distribution:

$$A + W + S = \text{Total number of votes}$$

$$S < (A + W)$$

and either

$$A = W \qquad \text{(Caplow's type 2 triad)}$$

or

$$A = S \qquad \text{(Caplow's type 3 triad)}$$

The probability that the subject will choose the weaker candidate can be designated p(W). The probability of choosing S, the stronger candidate can be designated 1 - p(W).

Minimum Resource Theory predicts that A will choose the weaker candidate, W, with a probability greater than .50 in both the Type 2 and Type 3 triad resource distributions. Phillips and Nitz's (1968) data confirmed this prediction. The data also showed that the p(W) was greater when A = S than it was when A = W. Phillips and Nitz (1968) hypothesized that this shift in preference toward the smaller contender was the result of the operation of some kind of anticompetitive norm. That is, some subjects sought to reduce intra-coalition competition over division of the relatively indivisible payoff--a nomination--by choosing the man whose resources were not equal to his own.

This hypothesis was examined more rigorously in a study by Nitz and Phillips (in preparation). The difference between [p(W), A=W] and [p(W), A=S] observed in the Phillips and Nitz's (1968) study was seen as a function of the subject's perceptions of the divisibility of the payoff. The experimental manipulation in Nitz and Phillips (in preparation) varied the nature of the payoff or outcome of the convention. Three conditions were used: an easily divisible payoff, a payoff that could be divided only unequally, and a payoff that could be divided only extremely

unequally. Each PDQ began as follows:

> A political party is divided into three factions or groups. These groups are designated Faction A, Faction B, and Faction C. The party is having a convention. There are 300 delegates to this convention. Each delegate has one vote. Faction A has ____ delegates (votes). Faction B has ____ delegates (votes) and Faction C has ____ delegates (votes).

In approximately half of the forms Faction A had 85 votes, Faction B or C had 85 votes, and the third faction had 130 votes. The subject's group, Faction A, was thus equal to the smaller of these two competitors. In the other half of the forms, Faction A had 115 votes, either B or C had 115 votes, and the third faction had 70 votes. The subject thus had resources greater than those of the weaker opponent. The three forms continued as follows:

Form 1. Easily divisible condition.

> The major business of the convention is to decide how many of 100 political jobs each faction will receive. Each faction would like to get as many of these 100 jobs as possible. It is standard procedure for two factions to get together and agree on some division of these jobs. If these two factions have a majority of the votes of the convention (at least 151 votes) between them, then the jobs are divided according to their agreement. An alliance between Faction A and Faction B would have ____ votes. An alliance between Faction A and Faction C would have ____ votes. An alliance between Faction B and Faction C would have ____ votes. Assume that you are the representative of Faction A(____ votes). Which of the other two factions would you try to contact first to try to make a deal for the political jobs?

Form 2. Unequally divisible condition.

The text of Form 2 was much the same as that for Form 1, with the exception of the following critical passage:

> The major business of the convention is to nominate a candidate for governor and a candidate for lieutenant governor. Each faction would like to have its man nominated for governor, but would not be extremely dissatisfied if he received only the lieutenant governor nomination.

Form 3. Very unequally divisible condition.

The critical passage in Form 3 was:

> The major business of the convention is to nominate a candidate for governor and a candidate for lieutenant governor. The governor's office is a very powerful position. The post of lieutenant governor, however, has generally been a political dead end for the candidates elected to it. (Nitz and Phillips, in preparation).

The three conditions above provided the experimental situation to test the operation of four different decision rules in the contest phase of the political convention paradigm. The subjects were assumed to evaluate others' expectations on the basis of the parity principle. Four alternate decision rules the subjects might use are described by the following general hypotheses:

1. Maximization

   Subjects seek to maximize their share of the payoff with respect to their coalition partners, regardless of the divisibility of the payoff.

2. Dominance

   Subjects prefer to be the dominant member of any coalition, regardless of the divisibility of the payoff.

3. Intra-Coalition Compatibility

   Subjects seek to form coalitions in which the division of the payoff can be negotiated with a minimum of intra-coalition friction. When the payoff is unequally divisible, the probability of choosing the unequal contender will be greater than when the payoff is easily divisible. When the payoff is easily divisible, no intra-coalition incompatibility will be engendered in a coalition between equals or in a coalition between unequals, so the maximization principle will be expected to hold.

4. Equalitarianism

   If the payoff is equally divisible, subjects seeking to minimize intra-coalition competition will prefer to form coalitions with equals more than with unequals--regardless of whether he is equal to the stronger or the weaker competitor.

These hypotheses are not totally independent. It was anticipated that the majority of the subject population would choose a maximization strategy in all payoff conditions--but that the divisibility of payoff would determine the size of that majority and the prevalence of the latter three marginal strategies.

The results of the Nitz and Phillips (in preparation) study are shown in Table 2.1. These data support the maximization and the compatibility hypotheses above. The maximization hypothesis assumption predicts that p(W) would be greater than .50 for any resource distribution. The data show that this is the case. The dominance hypothesis is not conditional on divisibility of payoff. It predicts p(W) will be high--and constant across conditions of payoff divisibility. The difference between p(W) for the easily divisible condition and p(W) for the unequally divisible condition at the point A=85 disconfirms the expectation that there will be no difference. Hypothesis three, intra-coalition compatibility, predicts that p(W) for easily divisible condition will be greater than p(W) for the unequally divisible conditions at A=85. This hypothesis is confirmed by the data presented in Table 2.1. Finally, hypothesis four assumes that an equal division is the most easily negotiated division and predicts that when the payoff is easily divisible, p(W) will be higher if A=W than if A≠W. That is, it predicts an effect exactly the opposite from the effect observed: p(W) at A=85 should be greater than p(W) at A=115. The observed difference is in the opposite direction.

The data in Table 2.1 indicate that the intra-coalition compatibility hypothesis is the most reasonable explanation of the deviation from the strict maximization observed in the Phillips and Nitz (1968) data.

Table 2.1 Probability of choosing the smaller contender as a function of resource distribution and divisibility of payoff

Payoff Divisibility Conditions	Type 2 Triad A = W f(W)	f(S)	p(W)	Type 3 Triad A = S f(W)	f(S)	p(W)	X^2
1. Easily divisible	49	10	.830	51	9	.850	.08
2. Moderately non-equally divisible	36	19	.655	50	10	.833	4.12*
3. Extremely non-equally divisible	48	23	.676	56	12	.824	4.01*

Between divisibility conditions X^2 comparisons

	C_1	C_2	C_3	C_1	C_2	C_3
C_1	--	4.65*	4.06*	--	.20	.16
C_2		--	.06		--	.00
C_3			--			--

* $p < .05$

Integration of Strategy Selection Hypotheses

The findings of the Gamson (1961b), Chertkoff (1966), Phillips and Nitz (1968) and Nitz and Phillips (In preparation) studies suggest the importance of the contact phase in the process of alliance formation. Phillips and Nitz (1968) and Nitz and Phillips (In preparation) have demonstrated the viability of the maximization assumption strategy of Minimum Resource Theory for social contacts in the Type 2 and Type 3 resource distributions. They have also shown that perceived indivisibility of the payoff causes some persons to make contacts that would tend to minimize eventual intracoalition conflict (Nitz and Phillips, in preparation). Their conclusion that the maximization strategy of Minimum Resource Theory explains most coalition partner choices and that the major deviations from the maximization choice can be interpreted as strategies that would reduce intra-coalition competition is subject to three strong limitations.

In this section I will examine these limitations, suggest means of dealing with them, and present the elements of a theory of strategy selection whose major purpose is to explain those marginal strategies not predicted by the simple maximization hypothesis of Minimum Resource Theory.

The first limitation of Phillips and Nitz (1968) and Nitz and Phillips (in preparation) theoretical interpretation is related to Cole's (1969) security principle. The security principle asserts that when strategies can succeed with probabilities less than unity, individuals will choose coalition partners so as to maximize their chances of winning. The political convention paradigm can be interpreted as either a probabilistic or a deterministic game. If subjects conceive of a coalition formed in a convention to nominate a candidate as a necessary compaign force for

an impending general election, then the security principle would be relevant to their coalition choices. If they placed higher value on winning the general election than on attaining the top spot on the ballot, they would attempt to build the largest coalition possible. In the Nitz and Phillips (in preparation) PDQ such a strategy would be indicated if

$$p(W)_{\text{Type 2}} = p(W)_{\text{Type 3}} < 1/2$$

in the unequally divisible nomination condition. This security strategy asserts a preference for the smaller contender less than half of the time.

Another finding might be attributable to security strategies in the indivisible payoff convention situation. If some subjects perceived the uncertainty of a future general election as more salient when they are relatively weak than when they are relatively strong, they might choose security strategies when in a position of weakness and compatibility strategies when in a position of strength. This combination of strategies would lead to predictions like this:

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}}$$

That is, subjects would tend to choose the different (smaller) man in the Type 3 situation, where they were equal to the larger opponent. In the Type 2 situation, they would tend to choose the larger man (who controlled a <u>different</u> amount of resources). Moreover, if both of these strategies were found in a population that predominantly used Maximization strategies, the data would take the form:

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

But this is exactly the effect Nitz and Phillips (in preparation) identified as Intracoalition Compatibility! Nitz and Phillips' (in preparation) provide no means of distinguishing the alternative individual strategies that

might account for this aggregate statistic. This failure to discriminate between security and anti-competitive strategies is in part due to an inadequate conceptualization of the nature of these strategies.

Thus the theoretical implications of the Intracoalition Compatibility hypothesis proposed by Nitz and Phillips (in preparation) are not clear. A replication of Nitz and Phillips' (in preparation) experiment with alternate unequally divisible payoff conditions would provide a test of the conditions under which the Intra-coalition Compatability hypothesis identifies a form of Security strategy and the conditions under which it identifies a strategy that is independent of security motivation.

Three critical convention situations for a test of the distinction between Security and Compatibility strategies can be constructed. Condition I would be identical to the easily divisible payoff condition used by Nitz and Phillips (in preparation). Condition II would be identical to their unequally divisible condition, with nominations for the ballot positions for a state governorship and lieutenant governorship. This condition would represent a probabilistic payoff condition. While this condition does not directly manipulate the probability of winning, it replicates the ambiguity about the probabilistic dimension found in Nitz and Phillips' (in preparation) PDQ. Condition III would remove this ambiguity by presenting a convention in a one-party state. Thus the successful nominee need not be concerned about organizing support for a general election campaign. If he wins the nomination in the convention, he is virutally assured of the office itself.

All three conditions will provide tests of the Maximization hypothesis:

1. Maximization

> Subjects seek to maximize their share of the payoff with respect to their coalition partners. Their choices are not altered by the divisibility of the payoff or the probability of winning in a subsequent contest. This strategy is expected to occur with a probability of .50 or more under all three experimental conditions.

The following strategies are essentially marginal strategies. These strategies may or may not be independent of each other, but are not generally independent of the maximization strategy. They are defined so as to explain a portion of the subject population's behavior that is not accounted for by the Maximization hypothesis. The proportion of non-maximization strategy choices they explain is expected to vary as a function of the experimental condition.

2. Intracoalition Compatibility

> Subjects seek to form coalitions in which the division of the payoff can be negotiated with a minimum of intracoalition friction. When the payoff is unequally divisible, the probability of choosing the unequal contender is higher than when the payoff is equally divisible. When the payoff is easily divisible, no intracoalition incompatibility will be engendered in a coalition between equals or in a coalition between unequals, so the maximization decision rule will be used.

Here Condition III provides a clearly non-probabilistic form of an unequally divisible payoff. To the extent that Phillips and Nitz' (1968) and Nitz and Phillips' (in preparation) subjects perceived the payoff as simply a larger or a smaller nomination and ignored the probabilistic aspect of the nomination, their results should be replicated in this condition.

Conditions II and III test the independent hypotheses that the security strategy is elicited by a probabilistic payoff situation:

3. Security

> When the payoff to a coalition can be attained only with some probability less than unity, subjects will seek to maximize their chances of winning by forming the largest coalition possible.

Subjects are expected to choose Candidate W less often in Condition II than in Condition III in both the Type 2 and Type 3 triad, indicating a tendency to form larger coalitions under conditions of probabilistic payoff. An indication of the contribution of security strategies to the occurrance of Intra-coalition Compatibility behaviors is given by the difference

$$\left(p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}} \right)_{\text{Condition II}} - \left(p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}} \right)_{\text{Condition III}}$$

The test of this difference, moreover, is independent of the two hypothesis tests discussed above. If the difference given by the above equation is positive and significantly different from zero, it will indicate that the Intra-coalition Compatibility strategies identified by Nitz and Phillips (in preparation) can be attributed more correctly to Security choices. Otherwise, it will suggest that the effect observed by Nitz and Phillips (in preparation) is entirely the result of subjects' compatibility strategy choices.

These tests should resolve the ambiguity between the Security and the Intra-coalition Compatibility strategies identified by Cole (1968) and by Nitz and Phillips (in preparation). Three additional marginal strategies may now be presented. All three are marginal to the simple Maximization strategy, but two are closely related to Intra-coalition Compatibility.

4. Equalitarianism

> If the payoff is equally divisible, subjects seeking to minimize intra-coalition competition will prefer to form coalitions with equals more than with non-equals. (No stipulation will be made here as to the effect of probabilistic outcome on this decision rule.)

This hypothesis provides a plausible counter-proposition to explain the strategy choice Phillips and Nitz (1968) designated as weak anti-competitive behavior. Choosing Candidate W more often when the payoff is easily divisible may be a result of situational cues suggesting an equal split. Nitz and Phillips (in preparation) argue that an Equalitarian Strategy would be indicated by

$$p(W)_{\text{Type 2}} > p(W)_{\text{Type 3}} > 1/2$$

for the equally divisible condition, and

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

for the unequally divisible condition. Yet the Equalitarian prediction for the equally divisible condition differs from the prediction of the Intra-coalition Compatibility hypothesis only insofar as Compatibility predicts

$$p(W)_{\text{Type 3}} = p(W)_{\text{Type 2}}$$

A more general strategy that incorporates both would be defined:

$$p(W)_{\text{Type 2}} \geq p(W)_{\text{Type 3}} > 1/2$$

for the equally divisible Condition I, and

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

for the unequally divisible condition, Condition III.

The second strategy related to Intra-coalition Compatibility is not a subset of Compatibility behaviors, but rather is the complement. The Competition strategy can be defined:

5. Competition

   Subjects will seek to form coalitions that will allow maximum grounds for conflict; that is, coalitions for which the structure of the resource distribution suggests no obvious division of the payoff.

The Competitive strategy hypothesis predicts behavior exactly opposite of Compatibility behavior:

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

for Condition I, and

$$p(W)_{\text{Type 2}} > p(W)_{\text{Type 3}} > 1/2$$

for Condition III. The Competition strategy is obviously not independent of Compatibility. One is necessarily accepted if the other is rejected.

The final strategy pattern to be examined here is the Dominance Strategy:

6. Dominance

> Subjects prefer to be the dominant member of any coalition. Their choices are not altered by the divisibility or the payoff or by uncertain prospects of final attainment of the payoff.

The Dominance hypothesis is dependent on all of the preceeding marginal hypotheses. If any of the other hypotheses are confirmed, then the conditions of the Dominance hypothesis are not met. These conditions are as follows:

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

for Conditions I, II, and III.

The second limitation to the generality of Nitz and Phillips' (in preparation) findings is in a sense methodological. Gamson (1961a), Chertkoff (1966), and Cole (1969) gathered their contact data in an experimental situation in which subjects played in each others' presence. The PDQ studies gathered data in a classroom situation in which subjects were asked to imagine their opponents. A high degree of similarity between the induction

of the PDQ studies and the experimental induction in other studies of coalition formation in the political convention paradigm is insufficient grounds to justify the assertion that the PDQs and the political convention paradigm experiments yielded the same sort of social contact data. The comparability of the data from these two forms of the political convention paradigm must be demonstrated empirically. It is therefore necessary to introduce two experimental conditions, one in which subjects are given PDQs, and another in which they make essentially the same types of choices in an interactive three person political convention game.

The third restriction on the generality of the Phillips and Nitz (1968) and Nitz and Phillips (in preparation) hypotheses is that the identification of marginal strategies is essentially the identification of strategies selected by only a portion of the subject population. The development of an experimental paradigm that will permit positive identification of individual strategies is the topic of the next chapter.

Chapter III

Situation Structure, Cognitive Complexity, and Machiavellianism as Determinants of Strategy Selection

The Nitz and Phillips' (in preparation) study was among the first to examine a set of systematically related coalition strategy hypotheses under alternative experimental conditions. Their use of two convention resource distributions (Type 2=S < (A+W) A=W; Type 3=S < (A+W), A=S) and three payoff divisibility conditions provided an experimental design that would necessarily either confirm or reject the Maximization hypothesis, and could support one and only one of the marginal strategy hypotheses.

The design of the Nitz and Phillips' (in preparation) study, however, does not permit identification of individual's strategies. It provides information only on the existence of the strategy in the population. The two critical statistics, p(W) for the Type 2 triad and p(W) for the Type 3 triad within any one payoff condition, are based on the choices of independent samples of subjects. Since a major goal of this study is to identify individual strategy patterns and to predict these strategies from individual difference measures, a situation must be constructed that will provide Type 2 and Type 3 choices for each individual.

Identification of Individual Strategies

Nitz and Phillips (in preparation) were able to identify four distinct strategies on the basis of joint consideration of their subject populations' choices in Type 2 and Type 3 triad PDGs. Their subject's choices of either Faction (W) or Faction (S) yielded only one bit of information. The four mutually exclusive strategies they defined, however, were necessarily based

on two bits of information. If subjects were asked to make two choices, one in a Type 2 triad and one in a Type 3 triad, they would supply two bits of information. This would be sufficient to identify four alternative strategies among the individuals in the subject population. Joint consideration of the four possible combinations of the two choices a person could make in the two coalition situations should permit the identification of four strategy types.

The choice measures can be obtained for a subject if he plays in a Type 2 triad game and a Type 3 triad game. Since we are concerned here only with social contact behaviors, they may be obtained equally well if he takes a Type 2 PDQ and a Type 3 PDQ, or if he plays a Type 2 game and takes a Type 3 PDQ. Moreover, if the subject is given no feedback he is subject to less uncontrolled social interaction that would unpredictably provide cues for his choices in the second PDQ.

The four possible combinations of choices in the two PDQs, are illustrated as follows:

Figure 3.1

Joint Choices in Types 2 and 3 Triads

	Type 2	Type 3
1.	E	W
2.	E	E
3.	S	W
4.	S	E

E = A choice of the equal resource opponent;

W = A choice of the weaker resource opponent;

S = A choice of the stronger resource opponent.

These four joint choice patterns can be mapped isomorphically into a set of four simple strategies. These basic strategies generate a more complex pattern of strategies when two variables discussed in Chapter II are added to the design.

Strategy Interpretation

Indivisible or uncertain payoffs will change the interpretation of these four strategy patterns in much the same way as they did in Chapter II. I will discuss each of the four choice patterns above and elaborate the changes in strategy they represent as a function of the divisibility and certainty of payoff.

Choice pattern No. 1, "E" in the Type 2 situation and "W" in the Type 3 situation, suggests only one individual strategy. According to the Maximization hypothesis, choosing the weaker contender in both the Type 2 and Type 3 triads would indicate a maximization strategy. This choice pattern indicates the same strategy regardless of the payoff condition. In the Type 3 triad a choice of the weaker contender promises the highest payoff, while in the Type 2 situation, choice of the weaker contender promises either an equal payoff or at least an equal chance for the higher of the indivisible payoff.

Two different strategies may be inferred from choice pattern No. 2(EE), the choice of the equal contender in both Type 2 and 3 triads. In Condition I, choosing the equal-resource competitor suggests an explicit division of the easily divisible payoff: an equal split. This sort of division could be preferred because of a preference for equalitarianism, a dislike of negotiation, or a desire to avoid intra-coalition conflict. In the unequally divisible Conditions II and III choice of the equal contender would not take advantage of the strategy suggested by the unequal division

of payoff. Thus, such a choice implies competitive motive or desire to negotiate the division of payoff in the absence of any apparent guidelines. Figure 3.2 shows how this choice pattern leads to different strategies for the two payoff conditions.

Figure 3.2

Theoretical Strategies by Divisibility Condition

	Choice Pattern	Condition I Easily Divisible	Condition II Unequally Divisible Probabilistic	Condition III Unequally Divisible Certain
(1)	EW	Maximization	Maximization	Maximization
(2)	EE	Intra-coalition compatibility	Competition	Competition
(3)	SW	Competition	Intra-coalition compatibility	Intra-coalition compatibility
(4)	SE	Security	Security	Security

The third choice pattern, the choice of the stronger contender in the Type 2 convention and the weaker contender in the Type 3 convention (SW) suggests two different strategies. In the easily divisible condition, choosing the different rather than the equal opponent does not take advantage of the obvious payoff division suggested by the situation. Choice of the unequal competitor suggests a willingness to compete over the division of the payoff. In Conditions II and III choosing the unequal contender is consistent with the obvious unequal divisibility of the payoff, and leads to minimal intra-coalition conflict.

The fourth choice pattern, the choice of the stronger man in the Type 2 situation and the equal man in the Type 3 situation (SE), suggests a pure security strategy in Condition II. There would seem to be no strategy

advantage in making these choices in Conditions I and III, where any coalition is certain to win the payoff. If p(SE) in Condition II is significantly greater than p(SE) in Conditions I and III, a security interpretation can be made for p(SE) in Condition II. If there is no difference, the security hypothesis will not serve as an adequate strategy description for (SE) choices in the political convention paradigm in Condition II.

As noted in Chapter II, the Maximization strategy is likely to be the most frequently chosen strategy. It is also a strategy which is associated with a constant response across all divisibility conditions. It would be relatively simple to explain a lack of effect due to individual differences if this were the only strategy examined. The three remaining strategies are essentially marginal strategies. But these are precisely the strategies that fluctuate with changes in the structure of the competitive environment. This observation suggests that these strategies in particular may be susceptible to individual variations.

Prediction of Individual Strategies

The theory of coalition strategy selection outlines in Chapter II consists of two classes of hypotheses. The first type of hypothesis deals with the evaluations an individual makes about his competitive environment. The only hypothesis of this class developed in this study is stated:

> A. Any participant will expect others to demand from a coalition a share of the payoff proportional to the amount of resources he contributed to the coalition.

The second class of hypotheses is a set of decision rules that specify the strategies to be selected under different environmental conditions: the divisibility of payoff and the certainty of payoff. Each of these

hypotheses assumes that the individual perceives others to have a parity expectation. Above we developed a paradigm in which an individual's decision rule can be identified as one of four mutually exclusive strategy types: Maximization, Competition, Security, or Intra-coalition Compatibility. This chapter will present the thesis that the strategy an individual chooses is a function of the way he perceives the situation, particularly of the estimate he makes of his opponents' expectations in the situation. The way he perceives the situation is, in turn, a function of either his cue utilization capacities or his orientation toward power, control or competition.

Two measures of the style in which people perceive social situations, namely Machiavellianism and cognitive complexity, are particularly relevant to the prediction of strategy choices. Information about an individual's level of cognitive complexity, as an indicator of patterns of cue utilization should permit the prediction of the manner in which he perceives a social situation. Machiavellianism, as an orientation toward power, should also differentiate patterns of estimating the competitive environment.

It would be desirable to predict specific patterns of social perception on the basis of cognitive complexity or Machivellianism scores and to predict strategies from these perceptions. While social perception has been studied extensively, no systematic research has examined perceptions of coalition formation situations. This study will not undertake a major analysis of social perception. It will, however, pose hypotheses linking cognitive complexity and Machiavellianism to the subject's strategy selection patterns.

Cognitive complexity. A substantial amount of research has linked individuals' strategy selection patterns to measures of their cognitive complexity.[1] Cognitive complexity refers here to an individual's ability to integrate conflicting information. Four nodal systems of integrative complexity have been described in detail by Harvey, Hunt and Schroder (1961). These may be summarized as follows:

> System I. At this lowest level of integrative complexity, the rules or schemata for categorizing stimuli are highly fixed and simple. Simple schemata, norms or authorities help the individual structure his environment in a complete and unyielding way. System I individuals are characterized by categorical, black-white thinking, minimization of conflict and avoidance of ambiguity, self definition in terms of external anchors, preservation of standards and minimization of alternatives and over-generalization of fixed approaches or stereotypes.
>
> System II. Schemata for categorizing stimuli are still relatively simple, but more alternatives are perceived. The System II individual perceives his world against a background of self vs. others, and accepts self, while rejecting others. This leads to an absolutistic orientation toward others who, when seen in a position of potential control are "warded off". The individual is detached and negatively independent.
>
> System III. At this level both the self and other people are highly differentiated. This enables the System III individual to be highly sensitive to others and to attempt to match his perceptions to those of others. He is highly capable of putting himself in the role of others and perceiving himself as others perceive him. He is oriented toward maintaining close interpersonal relationships; rejection is threatening.
>
> System IV. At the highest level of integrative complexity a diverse world filled with many alternatives is perceived. The System IV individual is highly autonomous and reacts to people as a source of information. He generates a large variety of alternative interpretations of events and can thus react to the subleties of his environment with appropriate and novel responses.

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[1]Relatively complete bibliographies of these studies are found in Schroder, Driver and Streufert (1967), Harvey, Hunt and Schrdoer (1961) and Harvey (1966). Vannoy (1967) provides an informative comparison of a number of different measures of cognitive complexity.

Harvey (1966) presents preliminary results of a number of studies designed to validate these conceptual systems constructs. Subjects were categorized as System I, II, III or IV on the basis of their responses to a projective measure, the "This I Believe" test (TIB). In addition subjects in the various studies took some subsert of a group of standard attitude scales or measures on tasks designed to indicate change of set. The four systems may be characterized in terms of some of the more significant differences on these measures as follows.

System I persons tend to be cognitively simple on Kelley's (1956) Role Rep Test, high on Authoritarianism (Adorno, 1950) and Dogmatism (Rokeach, 1964), highly rigid (Gough-Sanford, 1954), high in Edward's EPPS (1954) Deference subscale and low on the Change and Autonomy subscales. System II persons are the second most simple group on the Kelley (1956) test, low on EPPS Deference and Affiliation, high on Autonomy and Aggression and high on Machiavellianism. System III subjects ranked second most complex on the Kelley (1954) test, highest on EPPS Affiliation, low on Autonomy and Change. Finally, System IV persons ranked highest in complexity on the Kelley test, lowest on Authoritarianism, Dogmatism and Rigidity, low on EPPS Deference and high on Autonomy and Change.

Four different tasks measured change of set, the Gottschaldt-Embedded Figure Test, Asch's (1952) impression formation task, and two tasks requiring subjects first to describe discrete units, then integrate them into a single description. System IV persons performed more successfully than any other system on all four tasks (Harvey, 1966). On the Denny Doodlebug Problem (Rokeach, 1960), System I subjects took more time, requested more help from the experimenter, and used fewer cues appropriately than System IV subjects.

Harvey (1965) examined the ability of the four system types to shift set in a more direct social setting. Subjects were asked to construct and record arguments that contradicted their personal beliefs about a topic. Their performance was evaluated on 18 content dimensions. System IV subjects outperformed all other categories on all 18 dimensions. System II subjects ranked second when they believed their arguments were to be private, and last when their tape recorded arguments were to be played to a faculty committee.

Felknor and Harvey (1964) examined cue utilization in concept formation. Subjects in the four systems were scored on the redundancy of the information they requested in trying to solve the problems. They were also scored on whether they guessed at answers on the basis of knowledge of the relevancy of the cues or on the basis of hypothesis disconfirmation. System I subjects were significantly more redundant than Systems II and IV. System IV subjects used relevancy of cues as a basis for guessing significantly more often than System I persons. System III persons, however, performed poorly in the private condition, but they ranked second in the public condition.

Tuckman (1966) developed an objective forced-choice measure of Harvey's (1961) four conceptual systems. The test presents subjects with paired statements drawn from populations representative of the four system types. Tuckman's instrument, the "Interpersonal Topical Inventory" (ITI), yields four scores, each representing the number of items endorsed in a system category. Since these scores are not independent, the subject's highest score defines his conceptual system.

Tuckman (1966) administered the ITI and Schroder's (1967) Sentence Completion Test to 126 Naval enlistees. Of the 126 subjects, 94 were classifiable into one of the four systems on both measures. The contingency

coefficient for these classifications was .54 out of a maximum C of .87 ($p < .01$). In a study of the relationship of the ITI to other individual difference measures, Tuckman (1965) found that System I persons had the highest F-scale scores and Systems IVs the lowest ($F=3.68$, $df=3/207$, $p < .05$). Also, System IIs were the highest on Mach IV and System Is the lowest ($F=4.78$, $df=3/207$, $p < .01$). System II persons were lower than all others on Affiliation ($F=3.24$, $df=3/207$, $p < .05$; EPPS, Edwards, 1954).

These brief characterizations suggest that the conceptual systems constructs have sufficient fact validity to justify further research. The findings reviewed by Harvey (1966) do not, however, demonstrate that the four systems necessarily identify four distinct behavior patterns--in fact, they suggest that some forms of behavior may be highly relevant to one or two systems. To date the analysis of the effect of cognitive complexity on strategy selection has dealt only with extreme subjects on the complexity-simplicity dimension (Schroder, Driver and Streufert, 1967). A more fruitful line of inquiry would seem to be an investigation of strategy patterns of all four systems rather than just the two extremes. This study examines the effect of each of the four systems on individual strategy selection.

The ability of the cognitively complex individual to make relatively fine discriminations would be a strategic asset only if it gave him greater control over his environment. If, for example, the complex individual perceived a large number of available strategies and selected strategies on the basis of this perception alone (without regard to their relative appropriateness to the situation), the complex person might well be at a strategic disadvantage. Likewise, if he lost sight of his original goals in the face of a host of alternative strategies suggested by environmental

features, complexity would be dysfunctional to successful strategy selection. To discriminate between these two behavior patterns, the following general hypothesis can be advanced:

> C1. A larger proportion of relatively complex persons (Systems III & IV) than of relatively simple persons (Systems I & II) will select Maximization strategies.

Harvey's (1961) system concepts suggest the following specific strategy selection patterns in addition to the general hypothesis C1. The rigidity and need for a structured environment that characterizes the System I person suggests the following hypothesis:

> C2. A larger proportion of System I subjects will choose Security strategies than will choose any other marginal strategy.

The aggressiveness and competitiveness of the System II person suggests the following hypothesis:

> C3. A larger proportion of System II persons will choose a competitive strategy than will choose any other marginal strategy.

The sensitivity to interpersonal relationships that characterizes the System II person leads to the following hypothesis:

> C4. A larger proportion of System III persons will choose Intracoalition compatibility strategies than will choose any other marginal strategy.

The exploratory behavior exhibited by the System IV person suggests a final specific strategy hypothesis:

> C5. System IV persons will choose marginal strategies with equal frequency.

Machiavellianism. The concept of Machiavellianism employed by Christie is most aptly described by Geis (1963) in her validation study of the Mach Scale:

> Machiavellianism is usually understood as the willingness and ability to use guile, deceit, and other opportunistic strategies in order to manipulate others. It might also be described as a love of power and a methodology of interpersonal

> strategy for the use of power. To the extent that an individual is Machiavellian he responds to other people impersonally, as objects, to be used for his own ends, without regard for their interests or for such ideals as fair-play, justice, or equality. (Geis, 1963)

Geis (1963) examined the effect of Machiavellianism on competitive behavior in a coalition formation experiment. Geis (1963) used a parchesi-type game (Vinacke and Arkoff, 1957) in which players advanced markers along a playing board. The number of spaces advanced on a turn was equal to the value of a "power card" he chose to play. The first player or players to reach the end of the board won a monetary prize. The players would bargain openly to form a coalition agreeing on some split of the payoff. A coalition could be formed at any time, but it could also be broken on any turn. When a coalition was formed, it started from a position midway between the position of the markers of the partners. The pair then advanced a number of spaces equal to the product of the higher die value and the sum of the power cards each member chose to play.

Three variables were experimentally controlled. The first, power position, was determined by assigning decks of power cards to each of the three subjects in each game. The second, Machiavellianism was varied by selecting subjects who scored in the upper, middle, and lower quartile on one form of the Mach Scale and who also scored in the same or adjacent quartile on another form of the Mach Scale. The third variable was amount of information available. This was varied by having subjects place all power cards face-up on the table (an unambiguous condition) or having them hold the cards like a hand in a normal card game (ambiguous condition). Each subject played in all six possible games with different opponents in each game.

Geis (1963) found that High Machs were more successful than Low Machs within all power conditions in the ambiguous condition. Collapsing over power conditions, she also found that High Machs were more successful than Low Machs in the unambiguous condition, (Geis, 1963). No data on contact preferences, bargaining tactics, or pattern of forming and breaking coalitions were reported in that study.[2]

Geis, Christie, and Nelson (1963) conducted an experiment in which subjects (ostensibly) exercised control over other persons. The experimental paradigm was that of a social psychology experiment. The subject was asked to take "an important personality test" which in fact was a modified version of Witkin's (1938) Embedded Figures Test. The test administrator was portrayed as a student learning how to administer the test. During the test the administrator made some comments and falsified some of the feedback the subject was being given on his performance. The experimenter debriefed the subject and the confederate, telling them that the experiment was really a study in frustration tolerance. The subject was then asked to serve as test administrator for another subject. He was induced to lie about his subject's performance and attempt to distract and upset the subject. The "second subject" was in fact another confederate who paced his own performance by watching signal lights that were not visible to the subject administering the test.

Geis, Christie and Nelson (1963) found that High Mach subjects generated more manipulative or distracting tactics, used more imaginative, sophisticated and uncommon tactics and performed with much more "verve" than the Low Mach subjects. The Low Mach subjects, however, used more of

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[2]This type of data was discussed in two reports, but these have not been made available to this writer (Geis, 1964; Geis and Christie, 1965).

the tactics that had been explicitly suggested in the experimental inducement. (Geis, Christie, and Nelson, 1963). Moreover, the High Mach's reported that they enjoyed the experience and the opportunity to "play God", while the Low Mach's did not feel especially comfortable in their experimental role (Geis, Christie and Nelson, 1963).

A study of behavior in response to experimental conditions that introduced distributive injustice into a work-relationship provides some insight into the tactical usage of Machiavellians (Blumstein and Weinstein, 1967). Subjects were given the task of composing attitude scale items about college life. The task involved working with another subject who was actually a confederate. The pairs composed one set of statements; the stooge did either two-thirds of the work or one-third of the work. Each was asked to write down the portion of the work he performed so the experimenter could determine how much credit toward a course grade each participant would receive. The stooge claimed either one-third or two-thirds of the credit. The experimenter read the claims and gave the pair another topic. The subject and confederate were asked to compose a set of items and to record their contributions once more.

On the second claim for credit, High Machs were willing to take earned points from a stooge reluctant to claim them for himself. They tempered their demands when dealing with a partner who had previously requested the lion's share (Blumstein and Weinstein, 1967).

These three studies all suggest that Machiavellianism is related in some way to manipulative or competitive behavior. From Geis' (1963) study it is not possible to determine just what the High Machs did to become more successful. Geis, Christie and Nelson (1963), though, suggested that High Machs may be more creative in generating interpersonal communicative (or disruptive) acts.

A study by Dawson and Phillips (in preparation) provides some suggestion of Machiavellian strategy choices in the political convention situation. A Political Decision Questionnaire was given to 104 subjects. The questionnaire contained eight independent convention questions. The payoff was relatively indivisible, a political nomination. The total number of votes for each convention was 300. Three of the questions placed the subject above the equalitarian point with 144, 132, and 102 votes. Three more questions placed him below the equalitarian point with 98, 85, and 77 votes. One question put him at the veto point with 75 votes and another in the dictator region with 73 votes. The PDQ also included Form V of Christie's (1962) Machiavellianism Scale.

Subjects' Mach Scale scores were significantly ($p < .05$) correlated with their choices for the points W = 75, 77, 98, and 102 votes. Subjects with High Mach Scores tended to choose candidate W more often than those with Low Mach scores. According to the strategy system outlines in Figure 3.1 the choices the High Machs in Dawson and Phillips (in preparation) study could represent either maximization or competitive strategies.

Dawson and Phillips (in preparation) indicate that High Machs adopt a more competitive contact strategy than Low Machs. It would seem that all three studies confirm some portion of Geis' (1963) definition of Machiavellianism. Such confirmation still does not systematically explain what Machiavellians do and the conditions under which they do it. Returning to Geis' (1963) definition, we find that a Machiavellian may (1) be deceitful, (2) love power, (3) be skillful in the use of power, (4) act without reference to moral scruples, (5) act without regard to any particular social norms. This set of descriptors, though, covers an innumerable range of social activities or interpersonal tactics--but says

nothing at all about the situations in which each of the many different hypothetical forms of Machiavellian behavior might appear. There is no explicit algorithm for deciding which kinds of situations are amenable to Machiavellian tactics, since the tactics described cover almost all of human behavior.

In the political convention paradigm we can entertain two general hypotheses about the strategy selection patterns of High or Low Machiavellians. The first is comparable to the Maximization hypothesis for cognitive complexity systems:

C6. The proportion of High Mach persons who choose Maximization strategies will be larger than the proportion of Low Mach persons who choose maximization strategies.

The second hypothesis deals with the Machiavellian's choice of marginal strategies:

C7a. A larger proportion of Low Mach persons will choose security strategies than will choose any other residual strategy.

C7b. A larger proportion of High Mach persons will choose competitive strategies than will choose any other residual strategy.

Measures

The "This I Believe" test devised by Harvey and Schroder's (1967) Sentence Completion Test are projective measures which require a group of well trained coders to render subject's responses capable of analysis. Tuckman's "Interpersonal Topical Inventory" is a relatively simple forced-choice objective measure. Since this form of test may be scored by an appropriate computer program, it was used to measure cognitive complexity in this study.

Two versions of the Machiavellianism Scale have been used in research to date. The most popular, the Mach IV, is a Likert-format inventory. The Mach V is a forced-choice test composed of 20 triplets of statements.

Scores for each item set are obtained by asking subjects to indicate the statement they most nearly agree with and the statement they most disagree with. A Machiavellian response is scored whenever a Machiavelli paraphrase is ranked higher than an equally undesirable unrelated statement. A Machiavellian response is also scored when a reversal of a paraphrase of Machiavelli is ranked below an equally socially desirable statement. An individual's Mach Scale score is the number of item sets scored as Machiavellian responses. The Mach V is counterbalanced to control for social desirability effects elicited by the negative tenor of many of the Mach Scale items (Christie, 1962). The Mach V form will be used in this study.

Chapter IV

Objectives and Procedure

Objectives

The introduction to this study set two primary goals. The first was to develop a theory of strategy selection in coalition situations based on the distribution of resources and the divisibility of the payoff, two major aspects of a mixed-motive environment. The second was to predict individual's strategy choices from measures of his skill in utilizing situational cues and of his orientation toward power and control. This chapter will restate the hypotheses developed in the preceding discussion, outline the research design and present the experimental methods used.

A Resource Based Theory of Strategy Selection

The purpose of a theory of strategy selection is to predict under various conditions, the rules or strategies a person might use to select a coalition partner. The particular strategy selected is to some degree a function of the participant's perception of the divisibility and certainty of the payoff. One of the strategies, a Maximization strategy, is defined simply as the choice of W, the smaller of two contenders, as a potential coalition partner. This strategy is likely to occur under all variations in the payoff structure of the game. The remaining strategies are marginal choices. These are not independent of the Maximization strategy, but may occur along with Maximization. The marginal strategies explain variations in subjects' selection of potential partners that result from changes in the payoff structure. With one exception, each of the marginal strategies is independent of every other marginal strategy.

Two experiments were designed to elicit marginal strategies. Experiment I consists of two PDQs. One has a Type 2 ($A < (W+S)$, $A=W$) resource distribution. The other has a Type 3 ($A < (W+S)$, $A=S$) distribution. Experiment II consists of an interactive game with a Type 2 resource distribution, followed by a Type 3 PDQ. The payoff conditions under which the marginal strategies are expected to be discriminable are established in the following experimental paradigm.

Three experimentally manipulated payoff conditions are established: easily divisible-certain; invisible-uncertain; and indivisible-certain. One group of subjects is assigned to each condition, and each of the three independent groups plays a decision-making role in a Type 2 and a Type 3 resource distribution situation. The payoff structure for the three groups is as follows:

Figure 4.1
Experimental Payoff Conditions

	Condition I	Condition II	Condition III
Payoff representation	100 Political appointments	Nominations for Governor's and Lt. Governor's Position on party ticket in competitive state	Nominations for Governorship and Lt. Governorship in one party state
Divisibility of payoff	Easily divisible	Unequally divisible	Unequally divisible
Certain of attaining payoff	Certain	Uncertain	Certain

The experimental inductions for Conditions I and II followed Nitz and Phillips (in preparation).[1] The induction for Condition III introduced

[1]These inductions are excerpted on pp. 28 and 29 above and are found in Appendices A and B.

certainty of achieving payoff by portraying the payoff as nominations for the governorship and lieutenant governorship in a one-party state.[2]

The theory's strategy predictions can be tested against the data provided by Experiment I. All three conditions provide tests of the Maximization strategy hypothesis:

B1. Maximization.

> Subjects seek to maximize their share of the payoff with respect to their coalition partners. Their choices are not altered by the divisibility of the payoff or the probability of winning in a subsequent contest. This strategy is expected to occur with a probability of .50 or more under all three experimental conditions.

The Maximization hypotheses may be phrased in terms of the subjects choices,

$$p(W) > 1/2_{\text{Conditions I, II, III}}.$$

The marginal strategy hypotheses are tested by means of comparisons between experimental conditions. The Intracoalition Compatibility hypothesis states:

B2. Intracoalition Compatibility

> Subjects seek to form coalitions in which the division of the payoff can be negotiated with a minimum of intracoalition friction. When the payoff is unequally divisible, the probability of choosing the unequal contender is higher than when the payoff if equally divisible. When the payoff is easily divisible, no intracoalition incompatibility will be engendered in a coalition between equals or in a coalition between unequals, so the Maximization decision rule will be used.

An unambiguous test of the viability of this hypothesis is provided by a comparison between Conditions I and III. The hypothesis may be stated in terms of the experimental data as:

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[2]The Condition III induction will be found in Appendix C and an example of the complete experimental questionnaire will be found in Appendix D.

$$p(W)_{\text{Type 2}} = p(W)_{\text{Type 3}} > 1/2$$

for Condition I, and

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

for Condition III.

Another marginal strategy is closely related to the Intracoalition Compatibility strategy hypothesis. This is the Competition hypothesis:

B3. Competition[3]

> Subjects will seek to form coalitions that will allow maximum grounds for conflicts, that is, coalitions for which the payoff structure suggests no obvious division of the payoff.

The Competitive hypothesis thus predicts behavior that is the complement of Compatibility behavior:

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

for Condition I, and

$$p(W)_{\text{Type 2}} > p(W)_{\text{Type 3}} > 1/2$$

for Condition III.

These two hypotheses are not independent, but are completely dependent. A single test will determine which of these two marginal strategies is a plausible explanation for non-maximization strategy choices.

The final strategy hypothesis examined here is the Security hypothesis:

B4. Security

> When the payoff to a coalition can be attained only with some probability less than unity, subjects will seek to maximize their chances of winning by forming the largest coalition possible.

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[3]Tests of hypotheses 4, 5 and 6 were shown to be dependent on the tests of hypotheses 1, 2 and 3 in Chapter II and have been omitted here. The original numbering system has been retained here to permit cross referencing.

A comparison between probabilistic Condition II and non-probabilistic Condition III provides the data to test this hypothesis. The hypothesis predicts the following relation:

$$p(W)_{\text{Type 2}}^{\text{Condition III}} > p(W)_{\text{Type 2}}^{\text{Condition II}} > 1/2$$

These tests constitute the examination of the theoretical hypotheses at the level of population behaviors, the level of behavior that has been observed in almost all previous studies of coalition formation. The next two sections of this chapter will deal with the comparability of the PDQ to interactive group games and the prediction of individual strategy choices.

The PDQ and the Political Convention Game

The comparability of the social contact data obtained with the PDQ to the contact data obtained from a group of subjects sitting in the same room choosing a potential partner is examined quite simply. The second strategy experiment was administered to another group of subjects. Experiment II consists of two parts; the first is a political convention game similar in content to the Type 2 distribution PDQ of Experiment I. The subjects choose a potential partner to bargain with, bargain and divide the payoff. The first choice of a potential partner provides the social contact data for the Type 2 triad. The second part of the experiment was a Type 3 PDQ. The payoff conditions were identical with those in Figure 4.1.

A comparison of subjects' choices in the Type 2 triad conventions of Experiments I and II examines the isomorphism of the contact data of the PDQ and the interactive political convention paradigm experiment.

Individual Differences and Individual Strategies

An individual playing the two political convention games of Experiment I or II can make four possible responses: EW, EE, SW, and SE, that is, he

may choose the equal contender in the Type 2 triad and the weaker in the Type 3 triad, etc. The theory of strategy selection presented above maps four mutually exclusive strategies onto these response patterns. The mapping (Table 3.2) is a function of the divisibility of the payoff. By defining the strategies associated with specific choice patterns differently for Condition I and for Conditions II and III, the divisibility variable is incorporated into the strategy definitions, rendering the strategies independent of the competitive environment. Each strategy pattern represents individual behavior consistent with the theory of strategy selection, regardless of the subject's experimental condition. These individual strategy choices can thus be predicted from individual difference measures alone.

Cognitive Complexity

Harvey's (1961) constructs of the four conceptual systems suggest patterns of strategy selection different from the patterns of social perception. The Maximization strategy selection pattern predicted is:

C1. System II and IV subjects will select more Maximization and fewer marginal strategies than System I and III subjects.

Explicit predictions are also made for the marginal strategies selected by each System.

C2. A larger proportion of System I subjects will choose Security strategies than will choose any other marginal strategy.

C3. A larger proportion of System II subjects will choose Competitive strategies than will choose any other marginal strategy.

C4. A larger proportion of System III subjects will choose Intracoalition Compatibility strategies than will choose any other marginal strategy.

C5. System IV subjects will choose all three marginal strategies with equal frequency.

Machiavellianism

An orientation toward the exercise of power or toward competition leads to a maximization and a marginal strategy prediction:

C6. The proportion of High Mach subjects who choose Maximization strategies will be larger than the proportion of Low Mach persons who choose Maximization strategies.

C7a. A larger proportion of Low Mach subjects will choose Security strategies than will choose any other marginal strategy.

C7b. A larger proportion of High Mach subjects will choose Competitive strategies than will choose any other marginal strategy.

Method

Subjects. Subjects for Experiment I were 226 male undergraduate social science and political science students who participated in classroom groups.[4] Subjects for Experiment II were 243 male volunteers from introductory psychology and political science courses. These volunteers participated in 1-4 hours of experiments for extra credit toward their class grade.

Procedure

Experiment I. Each subject took a questionnaire in a classroom situation. The questionnaire included: (1) a brief statement of the American Psychological Association Code of Ethics relevant to individual difference and opinion measures; (2) a Type 2 PDQ; (3) a Mach V Scale revised for machine scoring;[5] (4) Tuckman's ITI Scale, revised for machine scoring, and (5) a Type 3 PDQ.

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[4]Two hundred-thirty females also took the questionnaire for Experiment I. Since female strategy behaviors have not been discussed in this study, these data will be analyzed at another time.

[5]The Mach V Scale is found on pp. 121-126 and the ITI is found on pp. 142 of Appendix E. The answer sheets for these two measures are also found in Appendix D. FORTRAN scoring subroutines are found in Appendix E.

Three payoff divisibility conditions were used in the PDQs. Condition I had an easily divisible payoff, 100 political jobs or patronage appointments. It is essentially the same as the easily divisible condition used by Nitz and Phillips (in preparation). The experimental induction is found in the PDQ of Appendix A.

Condition II has a payoff which was divisible only unequally, the nominations for the governor's and the lieutenant governor's places on the party ticket. This condition is also the same as Nitz and Phillips' (in preparation) indivisible condition. Condition II may also be considered a probabilistic payoff condition, since some subjects will attend to the expectation of an impending election. An example of this condition is found in Appendix B.

Condition III offered the same payoff as Condition II, but explicitly discounts the importance of the impending general election by specifying that the party holding the convention has been in control of state government for several years. Subjects are told that any candidate who secures the nomination is virtually assured of winning the general election. The text of the Condition III induction is found in Appendix C.

Within each payoff condition, subjects received both a Type 2 and Type 3 PDQ. The resource distributions for the two PDQs have been selected so that the difference between the odd man and the other two is equal for both types. Two counterbalanced forms are used in each PDQ. The distribution for the Type 2 resource distribution is as follows:

Figure 4.2
Type 2 Resource Distributions

	A	B	C
1a	100	150	100
1b	113	124	113
2a	113	124	113
2b	113	113	124

The distribution for the Type 3 triad is given in Figure 4.3.

Figure 4.3
Type 3 Resource Distributions

	A	B	C
1a	134	134	82
1b	134	82	134
2a	120	120	110
2b	120	120	120

Subjects receive one PDQ of each form number; e.g., 1a, Type 2 and 1a, Type 3.

Each form asks for the subject's first contact choice, the minimum bargaining share of the payoff he will accept, the reasons for his choice, what he expects the other faction leader to demand, and his estimate of his own bargaining ability. Since the length and quality of responses to these questions have been highly variable in the past, no explicit hypotheses will be formulated at this point.

Experiment II. Subjects were told they would participate in a series of mock political conventions. They actually participated in two activities, but only the first was an interactive convention. Each subject played in only one of the three payoff conditions in the convention. Within each payoff condition, the labels assigned to the subjects were counterbalanced according to the following scheme:

Figure 4.4
Counterbalance of Labels and Resource Values

		Subject Designation		
		X	Y	Z
Resource	(1)	150	100	100
Distribution	(2)	100	150	100
Order	(3)	100	100	150

Within each condition, seven triads were run in each of the three assignment orders. Twenty-seven triads comprised one experimental condition.[6] The second activity consisted of a Type 3 PDQ and the Mach V Scale and Tuckman's (1964) ITI.

The PDQ administered to the Experiment II subjects contains an instruction to treat the factions in the PDQ as essentially different from and not identified with the people in the live experiment.

The order of play in the political convention game was as follows:

1. Instructions were read to the subjects.[7]
2. Subjects were randomly assigned to candidate positions.
3. Subjects were asked for their written choices of contender with whom they wish to start negotiations.
4. If two subjects made reciprocal choices, these two bargained (in the presence of the experimenter, but out of the presence of the third subject) for three minutes. The bargaining session was recorded but is not analyzed in this study.
5. If an agreement was made, it was to be written and given to the experimenter. If no agreement was reached, the subjects were asked again to make choices.
6. If no reciprocal choices were made, the subjects were also asked to choose again.
7. After completing the questionnaire, subjects filled out the questionnaire described above.

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[6]One subject in each triad, the odd man, was lost because he had no meaningful choice. The number actually used was smaller than 54 in some cases because of subject errors.

[7]The experimental instructions are found in Appendix F.

Chapter V

Results and Discussion

The hypotheses presented in the previous chapters deal predominantly with marginal strategy choices. These are expected to be minor strategies, that under specifiable circumstances account for a portion of coalition formation behavior. The hypotheses are relatively easy to test; most call only for comparisons among proportions. The conditional nature of the hypotheses, though, would pose a problem of interpretation if these were the only analyses performed. We would have no indication of the conditions under which individual difference measures predict strategy selection, the relationship between subject's perceptions and strategy selection, or of any of the interaction effects among subsets of variables if only tests for differences were used.

The principle dependent variable, strategy choice, is a nominal level measure. Thus, most interval level statistics are inappropriate for this dependent variable. Contingency tests, however, are applicable. The major analysis used here will be a factorial partition of a contingency table (Sutcliffe, 1957). Since this method does not permit the use of an observation which has incomplete data, such as an unanswered question, the numbers used in the tables will decrease slightly as the number of levels in the factorial design increases. It will be possible to examine fairly complex interaction patterns, but most fourth level interactions will have many cells with expected values less than 5.0. To avoid the X^2 estimation problems encountered in such cases, some variables will be collapsed into

a smaller number of categories. In most cases, only the collapsed tables for lower order interactions will be shown, since the entire table is generally too large to interpret visually.

Population Behavior

Comparison of the PDQ and the Political Convention Game. The most direct indication of the comparability of the PDQ social contact data with that of the political convention game is a test of the difference

$$p(W)_{\text{Experiment I}} - p(W)_{\text{Experiment II}}$$

for the Type 2 triad, the resource distribution for which administration conditions differ. Table 5.1 presents the results of this test. The observed differences were not statistically significant under any payoff condition.

Another indication of the comparability of the PDQ and the political convention game is provided by a comparison of the distribution of strategies selected in Experiment I with those selected in Experiment II. Table 5.2 gives these distributions for the three payoff conditions. The Group X strategy effect is clearly significant, indicating that subjects in the two experiments did not select identical distributions of strategies. The Condition X strategy effect is also significant, but the Group X Condition X Strategy effect is not. The payoff condition, then, does affect the strategy distribution, but has no significant differential effect on the two experimental groups.

The inconsistency between the Group X Strategy effect in Table 5.2 and the lack of effect in Table 5.1 indicates that the two experiments elicited different distributions of individual strategies. These differences in individual strategies are masked in the population statistic p(W).

Table 5.1 Tests of the differences between $p(W)_{\text{Experiment I}}$ and $P(W)_{\text{Experiment II}}$ for the Type 2 Resource Distribution.

Condition	p(W) Experiment I	p(W) Experiment II	Difference	Pooled Sp	df	t
I	.797	.722	.075	.0747	93	1.00
II	.711	.588	.121	.0628	115	1.92*
III	.605	.500	.105	.0621	117	1.69

*$.05 \leq p \leq .10$

Table 5.2 Strategy selected as a function of group and payoff condition

Group	Condition	Strategy Type 1 Maximization	2 Competition	3 Security	4 Compatibility
Experiment I	I	38	6	6	9
	II	52	7	12	12
	III	45	4	13	19
Experiment II	I	21	7	3	5
	II	19	1	2	11
	III	17	2	1	18

Group X Condition X Strategy Factorial Contingency Analysis[a]

Effect	X^2	df	p
A Group	Fixed	0	
B Condition	Fixed	0	
C Strategy	Fixed	0	
AxB	2.15	2	ns
AxC	11.53	3	$\leq .01$
BxC	13.58	6	$\leq .05$
AxBxC	9.08	6	$.25 < p \leq .10$
Total	36.34	17	$\leq .005$

[a]The method of computation is from Sutcliffe (1957). Lawton (1968) programmed the analysis routine.

B1. Maximization:

The Maximization hypothesis asserts that p(W) will be greater than 1/2 for all experimental conditions. The observed value of p(W) is presented, for each experimental condition, in Table 5.2. The .95 confidence interval has been computed for each point. Table 5.3 indicates that three experimental conditions have .95 confidence intervals that include the point p(W) = .50. In Experiment I, Condition III, the lower bound of $p(W)_{\text{Type 2}}$ is .498; in Experiment II, Conditions II and III, the lower bounds of $p(W)_{\text{Type 2}}$ are .416 and .334, respectively. In all other conditions, the lower bounds of the confidence region exclude p(W) = .50. Thus the Maximization hypothesis is supported in all easily divisible Condition I groups and all unequally divisible Condition II groups except for the Type 2 triad in Experiment II. Maximization is supported in the Type 3 triads of both Experiment I and II in Condition III, but is not supported in either Type 2 or Type 3 triads in Condition III.

B2. Intracoalition Compatibility:

The Compatibility hypothesis predicts that

$$p(W)_{\text{Type 3}} = p(W)_{\text{Type 2}} = 1/2$$

in Condition I, and

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

in Condition III.

Table 5.4 presents tests of the difference $p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}}$ for payoff Conditions I and III in Experiments I and II. There are no significant differences in Condition I of either experiment, as predicted by the Compatibility hypothesis. The differences in Condition III are significant for both experiments, again in accord with the Compatibility hypothesis.

Table 5.3 p(W) with 95% confidence intervals by payoff condition, experiment and type of triad

Experiment and Type of Triad	Payoff Conditions														
	Condition I Easily Divisible					Condition II Unequally Divisible Uncertain Outcome					Condition III Unequally Divisible Certain Outcome				
	p(W)	N	s_p	Confidence Interval		p(W)	N	s_p	Confidence Interval		p(W)	N	s_p	Confidence Interval	
				Lower Bound	Upper Bound				Lower Bound	Upper Bound				Lower Bound	Upper Bound
Exp. I, Type 2	.797	59	.0524	.604	.900	.711	83	.0496	.613	.809	.605	81	.0541	.498[a]	.712
Exp. I, Type 3	.746		.0566	.634	.858	.771		.0462	.680	.862	.790		.0451	.701	.880
Exp. II, Type 2	.722	36	.0747	.570	.874	.588	34	.0844	.416[a]	.760	.500	38	.0812	.334[a]	.666
Exp. III, Type 3	.778		.0693	.637	.919	.923		.0456	.830	1.016[b]	.921		.0438	.832	1.010[b]

[a]The .95 confidence interval for this point includes the point .500.

[b]Overestimated due to small sample t statistic and rounding error.

Table 5.4 $p(W)_{Type\ 3} - p(W)_{Type\ 2}$ by experiment and payoff condition

Payoff Condition

Payoff Condition	Condition I Easily Divisible				Condition II Unequally Divisible Uncertain Outcome				Condition III Unequally Divisible Certain Outcome			
Experiment	$p(W)_3-p(W)_2$	Var	N	t^{α} diff	$p(W)_3-p(W)_2$	Var	N	t^{α} diff	$p(W)_3-p(W)_2$	Var	N	t^{α} diff
Exp. I	- .051	.256	59	-0.772	.060	.228	83	1.149	.185	.253	81	3.312*
Exp. II	.056	.340	36	.572	.324	.286	34	3.527*	.421	.358	38	4.335*

*$p < .001$

$^{\alpha}$ $t = \frac{\bar{d}}{se_{\bar{d}}}$, where $\bar{d} = \frac{\sum_{k}^{n} (X_{ki}-X_{kj})}{n}$; and X_{ki} = 1 if subject k's Type 2 choice is W, 0 otherwise,

X_{kj} = 1 if k's Type 3 choice is W, 0 otherwise.

The Competition hypothesis predicts that

$$p(W)_{\text{Type 3}} > p(W)_{\text{Type 2}} > 1/2$$

for Condition I, and

$$p(W)_{\text{Type 2}} > p(W)_{\text{Type 3}} > 1/2$$

for Condition III.

Since this prediction contradicts the prediction of the Compatibility hypothesis, which received strong support, the Competition hypothesis must be rejected as an explanation of marginal strategy choice.

Conditions I and II provide a test of the Compatibility hypothesis designed to replicate the conditions of the Nitz and Phillips study (in preparation). Table 5.4 indicates that the critical difference

$$p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}}$$

is significant for experiment II, the interactive group game, but is not significant for Experiment I, which most closely replicates Nitz and Phillips (in preparation). Thus, the Intracoalition Compatibility hypothesis has received strong support, but not under Nitz and Phillips' (in preparation) origional conditions.

B3. Security

An alternate interpretation of the finding Nitz and Phillips' (in preparation) interpreted as a compatibility effect is that the effect they observed was in part the result of a form of Security strategy played by subjects in the Type 2 triad who sought to build a larger coalition in the face of an uncertain outcome.

A test of the plausibility of this interpretation of the operation of a Security strategy is found in the difference between the effects observed in Condition II and those observed in Condition III. If the quantity

$$(p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}})_{\text{Condition II}} - (p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}})_{\text{Condition III}}$$

is positive, the difference identifies the proportion of the Intracoalition Compatibility effect observed by Nitz and Phillips (in preparation) that can be explained as a function of Security strategy choices. If the difference is zero or negative, it suggests that subjects in Conditions II do not perceive a greater value in minimizing conflict within the coalition than the subjects in Condition III. Table 5.5 indicates that there are no significant differences between the Compatibility effect observed in Condition II and that observed in Condition III. The differences observed ($t = -1.57$ $p \leq .13$ and $t = -.53$, $p > .50$, Experiments I and II, respectively) are negative, and do not support the Security hypothesis.

Prediction of Individual Behaviors

Behavior predicted from cognitive complexity. The subjects perception of their opponent's payoff expectations were obtained as written answers to the question, "what do you expect the other faction leader to demand?" These answers were coded into one of three classifications:

(a) The opponent would demand less than 1/2 of the payoff.

(b) The opponent would demand 1/2 of the payoff.

(c) The opponent would demand more than 1/2 of the payoff.

Category b also included several answers that opponents would demand something in a range of outcomes, such as 40-60%.

The cognitive complexity measures were scored according to Tuckman's (1964) recommended procedure: A subject was classified into the category in which he scored above the 75 percentile, provided he scored lower in all other categories. If a subject scored at or above the 75th percentile in more than one category, or below the 75th percentile in all categories, he was classified into category 0. Category 0 subjects were not used in analyses which used complexity as an independent variable.

Table 5.5 $[p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}}]_{\text{Condition II}}$ $[p(W)_{\text{Type 3}} - p(W)_{\text{Type 2}}]_{\text{Condition III}}$ by experiment

Experiment	$p(W)_3 - p(W)_2$ Condition II	$p(W)_3 - p(W)_2$ Condition III	Difference	Pooled σm	df	t	p (2 tailed)
Exp. I	.060	.185	-.125	.0794	162	-1.57	.12 (NS)
Exp. II	.324	.421	-.097	.165	68	- .53	> .50 (NS)

The distribution of cognitive complexity categories, perceptions, and strategies chosen is given in Tables 5.6 and 5.7. Table 5.6 presents subject's perceptions on their first (Type 2 triad) choice and Table 5.7 represents their perceptions on the second (Type 3 triad) choices. Cognitive complexity appears to be unrelated to strategy choice or to perception of the opponent's expectations in either political convention game. The only effect that approaches significance is the interaction between complexity, perception in the second game (Type 3 triad) and strategy choice.

Hypothesis C1. predicts that cognitively complex System III and IV persons will choose a greater proportion of Maximization strategies than will cognitively simple System I and II persons. Tables 5.6 and 5.7 present data relevant to this hypothesis. There is no difference in the proportion of Maximization strategies selected by the complexity groups ($X^2_{3df} = 5.65$, $.25 > p > .10$). Moreover, controlling for perception of opponent's expected demands does not render a significant Complexity X Strategy effect. Table 5.7 suggests, though, that there may be differences in strategy as a function of Complexity and Perception or differences in perception in the Type 3 game as a function of Complexity and Strategy in the preceding (Type 2) game. The complexity X Perception in the second (Type 3) game X Strategy effect approaches significance ($X^2_{6df} = 11.39$, $.10 > p > .05$).

Table 5.8 indicates the source of the effect observed above. The data here are those of Table 5.7 collapsed over complexity Systems I and IIIv. II and IV. The perception information in this table comes from the subject's second game which had a Type 3 resource distribution. There is no significant difference here in the perceptions of the two complexity groups ($X^2_{2df} = .588$, ns). Of those who perceive the opponent's payoff demand to be less than half of the total payoff, four times as many System II and IV subjects select a Maximization strategy as choose a Marginal strategy.

Table 5.6 Strategy choice by perception in the Type 2 convention by cognitive complexity

Cognitive Complexity	Perception of Opponent's Demands	Strategy Choice	
		Maximization	Marginal
System I	< 1/2	17	18
	≃ 1/2	5	9
	> 1/2	20	9
System II	< 1/2	18	5
	≃ 1/2	4	4
	> 1/2	14	8
System III	< 1/2	3	6
	≃ 1/2	3	3
	> 1/2	5	4
System IV	< 1/2	13	8
	≃ 1/2	9	3
	> 1/2	9	4

Factorial Analysis for Strategy Choice x Perception 1 x Cognitive Complexity

Effect	X^2	df	p
A Cognitive Complexity	Fixed	0	
B Perception 1	Fixed	0	
C Strategy	Fixed	0	
AB	3.47	6	ns
AC	5.65	3	.25 >p >.10
BC	2.08	2	ns
ABC	6.39	6	ns
Total	17.61	18	ns

Table 5.7 Strategy choice by perception in the Type 3 convention by cognitive complexity

Cognitive Complexity	Perception of Opponent's Demands	Strategy Choice	
		Maximization	Marginal
System I	< 1/2	18	22
	≃ 1/2	15	8
	> 1/2	9	6
System II	< 1/2	24	6
	≃ 1/2	10	6
	> 1/2	2	5
System III	< 1/2	4	7
	≃ 1/2	6	5
	> 1/2	1	1
System IV	< 1/2	20	6
	≃ 1/2	6	6
	> 1/2	5	3

Factorial Analysis for Strategy Choice x Perception^{2}x Cognitive Complexity

Effect	X^2	df	p
A Cognitive Complexity	Fixed	0	
B Perception 2	Fixed	0	
C Strategy Choice	Fixed	0	
AB	4.36	6	ns
AC	5.65	3	.25 >p >.10
BC	.75	2	ns
ABC	11.39	6	.10 >p >.05
Total	22.15	18	ns

Table 5.8 Strategy choice by perception in the Type 3 convention by cognitive complexity categories I + III v. II + IV

Cognitive Complexity System	Perception of Opponent's Demands	Strategy Choice	
		Maximization	Marginal
I + III	$< \frac{1}{2}$	22	27
	$\tilde{\sim} \frac{1}{2}$	21	13
	$> \frac{1}{2}$	10	7
II + IV	$< \frac{1}{2}$	44	11
	$\tilde{\sim} \frac{1}{2}$	16	13
	$> \frac{1}{2}$	7	9

Factorial Analysis of Strategy Choice x

Perception in Type 3 Triad x Complexity Category I + III v. II + IV

Effect	X^2	df	p
A Complexity	Fixed Effect	0	
B Perception	Fixed Effect	0	
C Strategy Choice	Fixed Effect	0	
AB	.558	2	ns
AC	4.736	1	< .05
BC	1.223	2	ns
ABC	11.392	2	< .005
Total	17.909	7	< .025

The System I and III subjects who see the opponent as demanding less than half of the payoff chose Maximization strategies less often than they chose marginal strategies.

Hypotheses C2. through C5. predict specific marginal strategies for each of the conceptual system types. Each hypothesis assumes as its null hypothesis that each marginal strategy will be chosen with equal probability. Table 5.9 presents the observed marginal strategy choices for each conceptual system along with the test of the deviation of the observed distribution from that predicted by the null hypothesis.

Hypothesis C2. predicts that System I subjects will choose more Security than any other marginal strategy. The observed strategies for System I persons differ from the null hypothesis slightly ($X^2_{2df} = 4.75$; $p < .10$), but this difference is in the wrong direction. The Security strategy is not the most frequently chosen. Hypothesis C2. thus lacks support.

Hypothesis C3. predicts that System II subjects will tend to choose Competitive strategies. The observed distribution is significantly different ($X^2_{2df} = 18.0$; $p < .001$) from the null distribution, but in the opposite direction from that predicted by C3. Hypothesis C3 is thereby disconfirmed.

Hypothesis C4. predicts that System III persons will select more Compatibility strategies than any other marginal strategy. Table 5.11 indicates that this prediction is confirmed ($X^2_{2df} = 6.71$, $p < .05$).

Hypothesis C5. predicts that System IV subjects will select all three marginal strategies with equal probability. Since this prediction is equivalent to the null hypothesis, a goodness-of-fit test rather than an independence test is required. The observed distribution fits the prediction of the null hypothesis moderately well ($.90 > p > .75$).

Table 5.9 Frequency of marginal strategy choices for four cognitive complexity categories

Complexity System	Strategy Choice		
	Competition	Security	Compatibility
I	6	10	16
II	1	4	16
III	5	3	12
IV	6	4	4

Contingency Tests Against the

Null Hypothesis $p(S_1) = p(S_2) = p(S_3)$

Complexity System	X^2	df	p	Confirmation of Hypothesis
I	4.75	2	.10> p> .05	No
II	18.00	2	<.001	Opposite Direction
III	6.71	2	<.05	Yes
IV	.43	2	.90 >p> .75	Yes
Total	29.89			
Strategy Main Effect	18.83	2	<.001	
Overall Complexity x Strategy	11.06	6	.10> p> .05	

Only one of the four marginal strategy hypothesis received support here. The overall Complexity X Strategy effect is given by partitioning the data of Table 5.9 to remove the main effect for Strategy. The Complexity X Strategy effect approaches significance ($X^2_{6df} = 11.06$; $.10 > p > .05$).

Behavior Predicted from Machiavellianism Scores

Hypothesis C6. predicts that High Mach subjects will choose a larger proportion of Maximization strategies than will Low Mach subjects. Table 5.10 presents strategy selections by cognitive complexity groups and High-Low Mach score groups. Machiaevellianism is not significantly related to selection of Maximization or Marginal strategies ($X^2_{1df} = 1.26$, ns). This finding disconfirms hypothesis C6. Nor is Machiavellianism related to cognitive complexity ($X^2_{3df} = 4.90$; $.25 > p > .10$). The interaction of Machiavellianism, complexity and strategy choice is in the predicted direction but is not significant ($X^2_{3df} = 1.01$, ns). The total effect in Table 5.10 is not significant ($X^2_{10df} = 12.83$; $.25 > p > .10$).

Hypotheses C7a. and C7b. predict that High Machs will tend to prefer Competitive Marginal strategies. Table 5.11 presents the distribution of marginal strategy choices by Machiavellianism groups. High and Low Mach subjects do not differ in their preferences among the marginal strategies ($X^2_{2df} = .512$; ns). Hypotheses C7a. and C7b. are not supported by these data.

The data in Tables 5.10 and 5.11 indicate no differential strategy choices attributable to Machiavellianism. The studies by Geis (1963), Geis, Christie and Nelson (1963), and Blumstein and Weinstein (1967) though, lead us to expect High Machs to behave differently from Low Machs in competitive situations. The finding above raises two questions about the

Table 5.10 Strategy choice by cognitive complexity and Machiavellianism scores

Complexity System	Mach	Strategy Choice: Maximization	Marginal
I	Lo	23	22
	Hi	19	14
II	Lo	13	8
	Hi	23	9
III	Lo	5	5
	Hi	6	8
IV	Lo	13	8
	Hi	18	7

Factorial Analysis of Strategy Choice x Complexity x Machiavellianism.

Effect	X^2	df	p
A Complexity	Fixed Effect	0	
B Machiavellianism	Fixed Effect	0	
C Strategy Choice	Fixed Effect	0	
AB	4.90	3	.25 > p > .10
AC	5.65	3	.25 > p > .10
BC	1.26	1	ns
ABC	1.01	3	ns
Total	12.83	10	.25 > p > .10

Table 5.11 Marginal Strategy Choices by Machiavellianism score group

Machiavellianism	Strategy Choice: Competition	Security	Compatibility
Lo	16	17	34
Hi	10	15	29

X^2 = .512 df = 2 ns

nature of Machiavellianism. First, does the construct measured by the Mach V scale identify an ability to select appropriate abstract strategies or does it identify a nonstrategic ability to deal with others only in close interpersonal situations? Second, does dichotomizing the Mach V scale scores or does the operation of summing the item scores mask the dimensions of the scale that predict behavior most effectively?

These questions can be answered with an additional multivariate analysis. If it is possible to predict strategy choices in these data from some weighted combination of Mach item scores, then it will be clear that the Mach scale can predict abstract strategy choices. If a different prediction equation is necessary for each of the four strategies, however, the utility and appropriateness of summing the item scores and assuming a unidimensional scale must be questioned. The UCLA BMD program for stepwise multiple discriminant analysis provides a simple means for making these tests (Dixon, 1967).

Table 5.12 presents the means and standard deviations of the Mach V items for each strategy type. The analysis program fits a linear regression equation to each of the strategy categories in such a way that the function constructed maximizes the discrimination of subjects falling into each category. The program adds one predictor variable (Mach item) to the regression equations on each iteration, always selecting that item on which the mean item score across strategies differs most. During the addition process the effects of the variables previously added to the prediction equations are partialled out. The resulting discriminant function weights for 20 predictor variables are presented in Table 5.13.

Each function is of the form

$$\text{Strategy}(j) = a_{j0} + a_{j1}x_{j1} + a_{j2}x_{j2} + \ldots + a_{jm}x_{jm}$$

Table 5.12 Means and standard deviations of Mach V item scores for each strategy type

Mach V Item No	I Maximization	II Competition	III Security	IV Compatibility	Mean over Strategies
Variable	n = 190	n = 27	n = 36	n = 76	n = 329
Strategy Type Means					
1	0.52105	0.51852	0.36111	0.42105	0.48024
2	0.60000	0.77778	0.61111	0.55263	0.60486
3	0.66316	0.77778	0.47222	0.64474	0.64742
4	0.40000	0.55556	0.36111	0.38158	0.40426
5	0.55789	0.44444	0.55556	0.42105	0.51672
6	0.74211	0.70370	0.61111	0.78947	0.73556
7	0.51579	0.29630	0.52778	0.48684	0.49240
8	0.45263	0.37037	0.38889	0.31579	0.40729
9	0.23684	0.07407	0.22222	0.11842	0.19453
10	0.46316	0.55556	0.52778	0.52632	0.49240
11	0.57895	0.62963	0.75000	0.65789	0.62006
12	0.69474	0.66667	0.72222	0.71053	0.69909
13	0.53158	0.48148	0.55556	0.60526	0.54711
14	0.38421	0.25926	0.38889	0.40789	0.37994
15	0.49474	0.59259	0.47222	0.53947	0.51064
16	0.68421	0.51852	0.72222	0.60526	0.65653
17	0.90000	0.96296	0.94444	0.92105	0.91489
18	0.73684	0.59259	0.66667	0.76316	0.72340
19	0.71579	0.70370	0.63889	0.72368	0.70821
20	0.64737	0.59259	0.47222	0.67105	0.62918
Strategy Type Standard Deviations					
1	0.50087	0.50917	0.48714	0.49701	
2	0.49119	0.42366	0.49441	0.50052	
3	0.47387	0.42366	0.50631	0.48177	
4	0.49119	0.50637	0.48714	0.48900	
5	0.49794	0.50637	0.50795	0.49701	
6	0.43863	0.46532	0.49441	0.41039	
7	0.50107	0.46532	0.50631	0.50315	
8	0.49906	0.49210	0.49441	0.46792	
9	0.42626	0.26688	0.42164	0.32525	
10	0.49995	0.50637	0.50631	0.50262	
11	0.49503	0.49210	0.43915	0.47757	
12	0.46173	0.48038	0.45426	0.45653	
13	0.50031	0.50917	0.50395	0.49204	
14	0.48769	0.44658	0.49441	0.49471	
15	0.50129	0.50071	0.50631	0.50175	
16	0.46605	0.50917	0.45426	0.49204	
17	0.30079	0.19245	0.23231	0.27145	
18	0.44151	0.50071	0.47809	0.42797	
19	0.45222	0.46532	0.48714	0.45015	
20	0.47905	0.50071	0.50631	0.47295	

where a_{j0} is the constant term for the jth strategy and a_{ji} is the regression coefficient for the ith item and the jth strategy.

The effectiveness of these prediction equations is indicated by the classification Table 5.14. The X^2 of the classification matrix is 73.09 with 9 df ($p < .001$). The discriminant functions are highly successful compared to the results in Tables 5.10 and 5.11.

The presence of as many as 20 items in the prediction equation, though, raises the question of the relative importance of any particular item or subset of items. Table 5.15 summarizes the steps in the present analysis. No single variable discriminated categories with a conditional probability level appreciably less than .10, and only 9 variables discriminated with conditional $p < .25$. Nevertheless, Table 5.15 indicates that the accuracy of overall discrimination increases rapidly. After the fourth item added, the F approximation of Wilks' Lambda to test the equality of group means is significant at the .01 level ($F = 2.30$; $df = 12,852$). The effects of limiting the prediction equations to the more significant items are shown in Tables 5.16 and 5.17. Table 5.16 presents the classification matrix for discriminant functions based on the first eight variables listed in Table 5.15. The distribution of predicted strategies across observed strategies shows a strong degree of association ($X^2_{9df} = 49.88$, $p < .001$). Table 5.17 shows the classification matrix for prediction equations using only the first four Mach items. The level of association is relatively high in this table also ($X^2_{9df} = 27.86$, $.005 > p > .001$).

An indication of the nature of the "Machiavellianism" underlying each of the strategies can be seen by examining the items on which the strategies differ most markedly. Table 5.18 summarizes a series of tests which identify

Table 5.13 Linear function discriminating four strategy types on the basis of 20 Mach V item scores

Mach Item No.	Linear Coefficients for Each Strategy Type			
	I Maximization	II Competition	III Security	IV Compatibility
1	1.87703	1.95503	0.99802	1.26568
2	1.44775	2.22581	1.59916	1.25567
3	2.12372	2.94689	1.08141	2.10734
4	0.79066	1.86258	0.72249	0.91590
5	0.98275	0.59006	1.15272	0.51356
6	1.54095	1.23982	1.00355	1.75744
7	1.00361	0.01019	1.21310	0.91430
8	1.37535	1.14201	0.91424	0.70363
9	1.92810	0.86398	1.77829	1.18258
10	1.06840	1.49766	1.40395	1.33324
11	1.53996	1.73637	2.42302	2.16943
12	2.87590	2.82723	2.86919	3.05498
13	2.16363	2.12922	2.27833	2.51544
14	1.00424	0.55182	1.28434	1.29258
15	1.29153	1.89076	1.23761	1.48925
16	-0.42412	-1.39225	-0.14017	-0.82861
17	10.45706	11.45313	10.84952	10.51994
18	1.62254	0.85477	1.33652	1.82874
19	3.25176	3.35551	3.09557	3.20752
20	2.24840	1.95887	1.60844	2.45587
Constant	-13.25240	-14.06542	-12.75385	-13.52576

Table 5.14 Number of subjects classified into strategy groups on the basis of Mach V scores on 20 items

Observed Strategy Group	Predicted Strategy Group I Maximization	II Competition	III Security	IV Compatibility
Maximization	76	41	38	35
Competition	3	18	2	4
Security	6	3	19	8
Compatibility	8	20	19	29

$X^2_{9df} = 73.09 \quad p < .001$

Table 5.15 Summary table of steps in discriminant program[a]

Step Number	Variable Entered	F Value to Enter[b]	Degrees of Freedom	p <	Wilks' Λ	F approximation[c]	Degrees of Freedom	p <
1	9	2.5814	3, 325	.10	0.9767	2.58	3, 325	.10
2	3	2.4203	3, 324	.10	0.9553	2.49	6, 648	.05
3	7	2.1448	3, 323	.10	0.9367	2.38	9, 786	.01
4	1	2.0493	3, 322	.25	0.9191	2.30	12, 852	.01
5	11	1.9172	3, 321	.25	0.9029	2.23	15, 886	.01
6	8	2.0017	3, 320	.25	0.8863	2.19	18, 905	.01
7	16	1.3883	3, 319	.25	0.8749	2.08	21, 916	.01
8	4	1.6867	3, 318	.25	0.8612	2.03	24, 923	.01
9	20	1.4195	2, 317	.25	0.8498	1.97	27, 926	.01
10	2	1.2608	3, 316	ns	0.8397	1.90	30, 928	.01
11	18	1.1828	3, 315	ns	0.8304	1.83	33, 929	.01
12	5	1.1710	3, 314	ns	0.8212	1.78	36, 928	.01
13	6	0.9494	3, 313	ns	0.8138	1.71	39, 928	.01
14	15	0.7761	3, 312	ns	0.8077	1.64	42, 926	.01
15	14	0.7616	3, 311	ns	0.8018	1.59	45, 925	.01
16	10	0.6941	3, 310	ns	0.7965	1.53	48, 923	.01
17	17	0.5598	3, 309	ns	0.7922	1.47	51, 921	.05
18	13	0.4877	3, 308	ns	0.7884	1.41	54, 919	.05
19	12	0.1111	3, 307	ns	0.7876	1.34	57, 916	.10
20	19	0.0607	3, 306	ns	0.7871	1.27	60, 914	.10

[a]Criterion set to enter the variable with the highest F value of those that have not been entered.
[b]These are the likelihood ratio tests of equality, over all four strategy groups, of the conditional distribution of the variable selected, given the variables previously entered.
[c]After Dixon (1967) and Rulon and Brooks (1968).

Table 5.16 Number of subjects classified into strategy groups on the basis of Mach V scores on eight most discriminating items

Observed Strategy Group	Predicted Strategy Group I Maximization	II Competition	III Security	IV Compatibility
Maximization	68	43	45	34
Competition	3	16	2	6
Security	7	7	19	7
Compatibility	11	19	21	25

$X^2_{9df} = 49.88 \quad p < .001$

Table 5.17 Number of subjects classified into strategy groups on the basis of Mach V scores on four most discriminating items

Observed Strategy Group	Predicted Strategy Group I Maximization	II Competition	III Security	IV Compatibility
Maximization	66	53	48	23
Competition	6	17	3	1
Security	8	7	16	5
Compatibility	19	30	15	12

$X^2_{9df} = 27.86 \quad .005 \geq p \geq .001$

Table 5.18 Items for which the means of the distributions of Mach V item scores differ across groups[a,b]

	Strategy Type		
	Maximization	Competition	Security
Competition	9,3,7,16,4,20,2,18, 5,6,15,10,17,13,12		
Security	8,11,16,20	3,7,1,16,4,20,2, 18,5,6,15,17, 13,12,19	
Compatibility	9,8	None	None

[a]This table represents those sets of k items for which the sum of Euclidean distances between strategy groups on items included was significantly different from zero. ($p = .05$: Actual F and df vary as the number of items increases.)

[b]Items listed in order of decreasing variance explained.

the strategies each Mach V item differentiates.[1] Table 5.19 identifies the keyed Mach V items represented by the item numbers in the discussion that follows. Because of the number of items involved that discriminate with relatively low probability, only the first four in each cell will be discussed here.

Competitive subjects were less likely than Maximizing subjects to view flattery as a useful tactic (9), more likely to tell real reasons only if they are useful (2), less likely to give real reasons for asking a favor (7), less likely to feel honesty is always the best policy (16), and more likely to believe that the best way to handle people is to tell them what they want to hear (4).

Subjects who chose Security strategies differed from Maximizing subjects as follows: Security subjects are more concerned about morally right action (8), humility and honesty (11), honesty as the best policy (16), and believe in trusting others (20).

Subjects who made Compatibility choices differ from Maximizing subjects by feeling flattery an inappropriate tactic (9), and are more concerned about morally right action (8).

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[1]The test is based on the statistic:

$$F_{mk} = \frac{(n-g-r+1)\, n_m\, n_k}{r(n-g)(n_m+n_k)} \sum_{i=1}^{r} (a_{mi} - a_{ki})\,(\bar{x}_m - \bar{x}_k)$$

$$df = r,\ r,\ n-g-r+1$$

where
$m = 1, 2, \ldots, g$
$k = 1, 2, \ldots, g$
g = number of groups
n = number of subjects
n_m = number of subjects in group m
r = number of variables included at time of test

Table 5.19 Keyed items from the Mach V scale

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

\+ Indicates a Machiavellian item.
\- Indicates a reversed item.

Finally, the competitive subject can be distinguished from the Security strategy subjects by their preferences for never telling the real reasons for actions unless useful (3), for giving reasons that carry more weight than the real reasons (7), their beliefs that most men value their property more than the death of their father (1), that honesty is not always the best policy (16), and that the best way to handle people is to tell them what they want to hear (4).

The preceding analysis of the relationship of the Mach V items to the strategy patterns defined in Chapters II and III suggests that Machiavellianism is not a useful concept so long as it is thought of as a unitary scale. If the items that predict specific strategies are isolated, however, distinct subsets of items effectively discriminate between alternative behaviors even when these behaviors are highly abstract strategy choices.

Chapter VI

Summary and Implications

The major objective of this study was to examine the effects of one of the conditions of nontransferable utility, namely indivisible payoffs, on coalition formation strategies selected in a mixed motive game. Two distinct analytical approaches were used. The first probed for evidence of consistent social contact strategies across the population of subjects as a function of experimental manipulation of divisibility and certainty of payoff. The second examined individual social contact strategy patterns and sought to predict them on the basis of individual difference measures that could be expected to have a bearing on strategic behavior. In addition, two different experimental measures were designed to identify social contact strategies, the Political Decision Questionnaire and an interactive political convention game. Differences between these two measures suggest an important consideration for future strategy research.

Payoff Conditions as Determinants of Strategy Selection

The analysis of social contact strategies in the subject population provided support for the Maximization and the Intracoalition Compatibility hypotheses: Under all conditions of payoff the most frequently chosen strategy is a maximization strategy; but under conditions of indivisible payoff, deviations from the Maximization strategy can best be attributed to a strategy that seeks to reduce conflict within the coalition about to be formed. Intracoalition Compatibility, however, was not supported in all experimental conditions. In a condition that replicated Nitz and Phillips (in preparation) identification of the Compatibility strategy, support was lacking.

This condition, the indivisible uncertain Condition II in Experiment I differed from the corresponding condition in the Nitz and Phillips (in preparation) study in one major respect: both Type 2 and Type 3 choices were obtained from each subject in this study. Although the two PDQ forms were separated by about 20 pages of questionnaire, the value of Pearson's contingency coefficient for the two PDQ choices in Experiment I is $\alpha = .41$ ($X^2=35.18$, $p < .001$). The degree of association between the Type 2 and Type 3 contact choices in Experiment II is insignificant ($X^2=.10$, ns). This lack of independence would account for the reduced effects in the Experiment I PDQ.

The experimental manipulation of certainty of the payoff did not induce security strategies in either experimental population. Moreover, the fact that $p(W)_{\text{Type 3}}-p(W)_{\text{Type 2}}$ is larger for the indivisible certain Condition III than for the indivisible uncertain Condition II in both experiments suggests that the Intracoalition Compatibility strategy identified by Nitz and Phillips (in preparation) is the result of the relative indivisibility of the payoff rather than the uncertainty of obtaining it. The fact that the differences observed in Table 6.4 are in the opposite direction from a Security prediction suggests that the indivisible-uncertain Condition II subjects may not have attended to the uncertainty cues in the experimental inductions.

An analysis of the comparability of two means of assessing social contact strategies identifies a critical shortcoming of coalition strategy research that has relied on population statistics to test strategy hypotheses. A test of the difference $[\, p(W)_{\text{Exp I}} - p(W)_{\text{Exp II}}]$ for all three experimental payoff conditions and both resource distributions yields no

significant differences between p(W)s in the two experiments for corresponding conditions. A factorial analysis of the individual strategy distribution across experiments and payoff conditions indicates a strong Experiment X Strategy effect and a strong Payoff Condition X Strategy effect. There is no significant three-way interaction.

It is clear that by defining strategies based on multiple bits of information for individual subjects it is possible to detect effects due to experimental presentation and payoff conditions. These results suggest that the results of a whole series of studies notably, Riker (1967), Gamson (1961b), Vinacke and Arkoff (1957), Vinacke (1959), Vinacke, Crowell, Dien, and Young (1966), and others may be suspect--since they aggregate behavior over games and subjects. This study finds that simple aggregation across subjects (without adding together non-independent successive games) masks significant behaviors. Moreover, the behaviors that are masked are the Marginal Security and Compatibility Strategies. Table 5.2 indicates that Security strategies appeared only in the indivisible conditions of the PDQ, and were chosen as frequently as Compatibility strategies, but marginal strategies were chosen only half as often as Maximization strategies. In indivisible Conditions II and III of the interactive game, however, Security strategies do not appear, but Compatibility, alone accounts for about half of all strategies chosen.

The above observations suggest that an essential element in the study of strategic behavior is a highly cautious approach to the possibilities of confounding effects. Identification of individual strategies as joint behavior on separate critical tasks, conditional on experimental manipulation of the payoff permitted positive identification of the Intracoalition Compatibility hypothesis as a descriptor of a meaningful strategy elicited by

a condition of nontransferable utility, i.e., indivisible payoff. Were the identity of the experimental tasks neglected, the joint aspect of the subjects' behavior would be lost and so would be the opportunity to critically test any hypothesis about the individual's strategy behavior other than Maximization. In light of this consideration, it seems crucial to ask whether the study of exclusively divisible payoffs, i.e., transferable utility situations may do more to hinder the development of political theory than to facilitate it. Certrainly Maximization cannot be taken on apriori grounds as the only viable political strategy.

Individual Differences as Determinants of Strategy Selection

Cognitive Complexity. The major complexity hypothesis predicts that cognitively simple System I and II persons will choose fewer Maximization strategies than cognitively complex System III and IV persons. This hypothesis was disconfirmed. The combinations of categories I + III and II + IV, however, do select the strategies predicted for cognitively simple and cognitively complex persons, respectively. An even stronger effect is found in the interaction among complexity, perception of the opponent's demands in the second game, and strategy choice. System II and IV persons select more Maximization strategies than do System I and III subjects; but the System II and IV subjects who do so are those who perceive their opponents as likely to demand less than half of the payoff (See Table 5.8). This effect cannot be attributed to the interaction between complexity and perception, since that effect is minute ($X^2_{2df} = .558$;ns). The two complexity groups, then do not perceive the situation differently, but act differently given equivalent perceptions.

An alternative explanation of this effect can be proposed. Since the perception measures were taken after the subject made his strategy

choice, they could be a result of his choice rather than a cause. Moreover, the greatest Perception X Complexity interaction effect occurs in the second game played. This interpretation cannot be dismissed on the basis of these data. The effect observed here suggests that it may be fruitful to design a study that controls for the reactive effect of social perception questions on subsequent strategy choices and of strategy choices on subsequent perceptions.

The marginal strategy hypotheses for cognitive complexity received at best only spotty support. Hypothesis C4 predicted that System III persons would select more Compatibility strategies than any other marginal strategy. The test against the null hypothesis indicates that they did so ($X^2_{2df} = 6.71$; $p < .05$), but the Complexity by strategy interaction over the entire marginal strategy table (Table 6.10) was not significant ($X^2_{6df} = 11.06$; $.10 > p > .5$). The distribution of strategies for System III persons is thus not significantly different from the distributions for the other three systems. In light of this observation and in light of the fact that the reverse ordering of the System II prediction is highly significant ($X^2_{2df} = 18.0$; $p < .001$), it seems reasonable to reject this entire set of marginal strategy hypotheses.

Of the five conceptual systems theory predictions, only a post hoc hypothesis predicting Maximization strategies for System II and IV persons was strongly supported. These two pairs of systems that show the most nearly equivalent strategy selection behavior, though, are not closely ordered in level of complexity to Harvey's (1961, 1963) theoretical constructs of cognitive complexity. Systems I + III and II + IV do not differ in the distribution of their perceptions of their opponents but

they differ in the way these perceptions are related to strategy selection. This behavior cannot be attributed to a greater or lesser degree of abstract abilities within the context of conceptual systems theory.

This observation suggests that conceptual systems theory should be revised, since the predictions we can make in the political convention paradigm are not related to the presumed level of complexity or abstractness of the four Systems. The conceptual system theorist, though, might challenge this conclusion by citing an important construct in his theoretical framework. The basic conceptual ability that is the referent of the concept of cognitive complexity is the ability to deal with large amounts of information. That is, to be cognitively complex is to be able to work effectively under an information overload or in a complex environment. The political convention paradigm used here could be described as an information underloaded or simple environment. The conceptual system theorist does not expect cognitive complexity to predict differential behavior in an environment that does not overload even the most conceptually simple subject. This sort of argument does not clarify the ambiguities we have noted in the concept of complexity. We have observed differential behavior in a simple environment, and we have predicted this behavior on the basis of a measure of cognitive complexity. If cognitive complexity predicts differential behavior only under information overload conditions, then what we have measured must not be the cognitive complexity originally intended. If we have measured cognitive complexity, then information overload must not be necessary for the prediction of individual behaviors from complexity information.

One suggestion as to what Tuckman's (1965) Interpersonal Topical Inventory may have measured is provided by Harvey's (1966) review of

complexity studies. Harvey (1966) notes that System II and IV persons tend to score low on the EPPS Deference subscale and high on the Autonomy subscales. Moreover, System IIs score high on Aggression. System I persons were high on EPPS Deference, and low on Change and Autonomy. System III persons were high on Affiliation and also low on Autonomy and Change. Not only do System I and III persons choose fewer Maximization and more Marginal (predominantly Security and Compatibility) strategies than System II and IV persons, but they achieve similar scores on measures of affiliation, deference and autonomy. It would be reasonable to hypothesize that Tuckman's ITI provides a measure comparable to certain subscales of the EPPS.

These considerations confront the student of political strategy with a major problem in the study of cognitive behavior. How does one identify patterns of cognition? How does one select a measure of these patterns appropriate to the behavior he wishes to predict? In the long run it would be fruitful to replicate Vannoy's (1965) study of the comparability of cognitive complexity measures, but to replicate it with a primary focus on identifying patterns of perceiving competitive situations and patterns of strategy selection. In the short run, though, the problems raised in this report suggest a project of narrower scope: a discriminate function analysis of ITI items as predictors of strategy patterns.

Machiavellianism. Hypotheses C6 and C7 predict that High Machs will select Maximization strategies more often than Low Machs, and that the High Machs will tend to select Competition strategies when they do select marginal strategies, while Low Machs will tend to select Security strategies. Both of these hypotheses were disconfirmed. The possibility that the Mach Scale might contain subscales which predicted specific strategies led to

a discriminant function analysis of the Mach V Scale items. This analysis identified items which discriminated among the four strategies. The two strategies most clearly distinguished were Security and Competition. Subjects who had responded with these strategy selections could be predicted with quite high accuracy on the basis of only four Mach V items--items that deal with mores and tactics for dealing with people. The discriminant functions for the Machiavellianism Scale did not permit proper classification of subjects into all strategy categories, however. While it was possible to distinguish Maximization from Competition, Maximization from Security, and Security from Competition, only two items lent to discriminating Maximization from Compatibility and no items discriminated Compatibility from either Competition or Security. It is apparent that some Mach Scale items predict some behaviors--what is important is that the behaviors the Mach items predict are the strategies that could not be predicted on the basis of divisibility or certainty of payoff.

Problems for Further Analysis

Lawton's (1968) program of Suttcliffe's (1957) factorial partition of contingency tables made the three-way interaction analyses in this report possible. The cell expected values decrease rapidly for four dimensional analyses and lend to unstable approximations to X^2. Thus several desirable analyses could not be performed. The technique of using dummy variables to represent discrete independent variables in regression equations, however, offers promise of completing additional analyses. The dummy variable technique can be extended to discriminant function analysis to obtain the joint effects of experimental conditions and individual difference item measures on discrete strategy behaviors. This particular extension, though,

requires prior knowledge of the pairwise interaction effects of individual difference items and the dummy variables representing discrete experimental condition.[1]

The discriminant function analyses of Machiavellianism items and specific strategy choices suggests that a similar analysis including ITI items and dummy variables for experimental conditions would not only be highly enlightening, but may be a step toward answering Greenstein's (1967) questions about the effects of personality variables. Under what conditions will which personality measures predict what kinds of political behavior? The present analysis has identified four distinct political strategy behaviors and the conditions under which Maximization and Compatibility strategies are elicited. It has also demonstrated a relationship between particular individual difference measures and strategies. Reanalysis of the data presented here may contribute to an understanding of the relationship between payoff conditions and individual difference measures and the interaction among environmental conditions, personality variables and strategy selection.

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[1]These analyses must be temporarily deferred until an efficient interaction program, such as Morgan and Sondguist's (1965) AID, is operational at the University of Hawaii.

BIBLIOGRAPHY

Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., and Sanford, R. N. The Authoritarian Personality. New York: Harper, 1950.

Asch, S. E. Social Psychology. New York: Prentice Hall, 1952.

Blumstein, P. W., and Weinstein, E. A. The redress of distributive injustice. American Sociological Association meeting, San Francisco, August, 1967.

Bond, J. R., and Vinacke, W. E. Coalitions in mixed-sex triads. Sociometry, 1961, 24, 61-71.

Budner, S. Intolerance of ambiguity as a personality variable. Journal of Personality, 1960, 30, 30.

Caplow, T. A theory of coalitions in the triad. American Sociological Review, 1956, 21, 489-493.

Caplow, T. Further development of a theory of coalitions in the triad. American Journal of Sociology, 1959, 64, 488-493.

Chaney, M. V., and Vinacke, W. E. Achievement and nurturance in the triad. Journal of Abnormal Social Psychology, 1960, 60, 175-181.

Chertkoff, J. M. The effects of probability of future success on coalition formation. Journal of Experimental Social Psychology, 1966, 2, 265-277.

Christie, R. Impersonal Interpersonal Orientations and Behaviors. Mimeographed research proposal, Columbia University, 1962.

Cole, S. G. An examination of the power inversion effect in three person mixed-motive games. Journal of Personality and Social Psychology, 1969, 11, 50-58.

Cole, S. G., and Phillips, J. L. A note on verbalized strategies in a three-person political convention situation. East Lansing: Human Learning Research Institute, Report No. 10, May 1967.

Dawson, J., and Phillips, J. L. Machiavellianism and manipulative strategy in a mock political convention. In preparation.

Dixon, W. J. (Ed.) BMD Biomedical Computer Programs. Berkeley and Los Angeles: University of California Press, 1967.

Driver, M. J. Conceptual structure and group processes in an inter-nation simulation. Part One: The perception of simulated nations. Ed. Test. Serv., April 1962, Report RB-62-15.

Edwards, A. L. Manual for the Edwards Personal Preference Schedule. New York: Psychological Corporation, 1954.

Felknor, C., and Harvey, O. J. Some cognitive determinants of concept formation and concept attainment. Technical Report No. 10, Contract Nonr 1147(07), University of Colorado, 1964.

Gamson, W. A. An experimental test of a theory of coalition formation. American Sociological Review, 1961, 26, 565-73.

Gamson, W. A. A theory of coalition formation. American Sociological Review, 1961, 26, 373-82.

Gamson, W. A. A Theory of Coalition Formation. Unpublished Dissertation, University of Michigan, Ann Arbor, 1960.

Gamson, W. A. Experimental studies of coalition formation. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology, Vol. 1. New York: Academic Press, 1964.

Geis, F. L. Machiavellianism in a three-person game. Ph. D. Dissertation, Columbia University, 1963.

Geis, F. L. Machiavellianism and the manipulation of one's fellow man. Paper read at American Psychological Association, Los Angeles, 1964.

Geis, F. L., and Christie, R. Machiavellianism and the tactics of manipulation. Paper read at the American Psychological Association, Chicago, September 1965.

Geis, F. L., Christie, R., and Nelson, C. In search of the Machiavel. Paper presented at American Psychological Association meeting, Chicago 1963.

Gillmore, G., Kline, D. K., Anderson, J., Lawton, D., and Phillips, J. L. A 3400/3600 Fortran program for computing chi-squares and exact probabilities of all effects in a factorial design. Technical Report No. Human Learning Research Institute, Michigan State University, in preparation.

Gough, H., and Sanford, R. N. Rigidity as a psychological variable. Unpublished Mss. University of California, Los Angeles, Institute of Personality Assessment and Research, 1952.

Greenstein, F. I. The impact of personality on politics: an attempt to clear away the underbrush. American Political Science Review, 1967, 61, 629-641.

Harvey, O. J. Cognitive determinants of role playing. Technical Report No. 3, Contract Nonr 1147(07), University of Colorado, 1964.

Harvey, O. J. Experience, Structure and Adaptability. Chapter 6, New York: Springer, 1966.

Harvey, O. J., Hunt, D. E., and Schroder, H. M. Conceptual Systems and Personality Organization. New York: Wiley, 1961.

Homans, G. C. Social Behavior: Its elementary forms. New York: Harcourt Brace and World, 1961.

Kelley, G. A. The Psychology of Personal Constructs. New York: Norton, 1956.

Kelley, H. H., and Arrowood, A. J. Coalitions in the triad: Critique and experiment. Sociometry, 1960, 23, 231-244.

Nitz, L. H., and Phillips, J. L. The effects of divisibility of payoff on confederative behavior. In preparation.

Phillips, J. L., and Nitz, L. H. Social contacts in a three-person "political convention" situation. Journal of Conflict Resolution, 1968, 12, 206-214.

Riker, W. H. Bargaining in a three-person game. American Political Scientific Review, 1967, 61, 642-656.

Riker, W. H. The Theory of Political Coalitions. New Haven: Yale University Press, 1962.

Rokeach, M. The Open and Closed Mind. New York: Basic Books, 1960.

Rulon, P. J., and Brooks, W. D. On statistical tests of group differences. In D. K. Whitla (Ed.), Chapter 2 Handbook of Measurement and Assessment in Behavioral Sciences. Reading, Mass.: Addison-Wesley, 1968.

Schelling, T. C. The Strategy of Conflict. New York: Oxford University Press, 1963.

Schroder, H. M., Driver, M. J., and Streufert, S. Human Information Processing: Individuals and Groups Functioning in Complex Social Situations. New York: Holt, Rinehart and Winston, 1967.

Schroder, H. M., and Streufert, S. The measurement of four systems of personality structure varying in level of abstractness. (Sentence Completion Method.) Princeton University: ONR Technical Report No. 11, Nonr 1858(12), 1962.

Shapley, L. S. A value for n-person games. Annals of Mathematical Studies, 1953, 28, 307-317.

Shapley, L. S., and Shubik, M. A method for evaluating for distribution of power in a committee system. American Political Scientific Review, 1954, 48, 787-792.

Shelly, R., and Phillips, J. L. A social contact model for coalition formation. East Lansing: Human Learning Research Institute, Report No. 6, September 1966.

Sherif, M. The concept of reference group in human relations. In M. Sherif and M. W. Wilson (Eds.), Group Relations at the Crossroads. New York: Harper, 1963.

Suttcliffe, J. P. A general method of analysis of frequency data for multiple classification designs. Psychological Bulletin, 1957, 51, 134-137.

Tuckman, B. W. Personality structure, group composition, and group functioning. Sociometry, 1964, 27, 469-487.

Tuckman, B. W. Integrative complexity and attitudinal orientation. Perceptual Motor Skills, 1965, 21, 838.

Tuckman, B. W. Integrative complexity: its measurement and relation to creativity. Educational Psychological Measurement, 1966, 26, 369-382.

Tuckman, B. W. Personal Communication. 1968.

Vannoy, J. S. Generality of cognitive complexity-simplicity as a personality construct. Journal of Personality and Social Psychology, 1965, 2, 385-397.

Vinacke, E. A. Sex roles in a three-person game. Sociometry, 1959.

Vinacke, W. E., and Arkoff, A. Experimental study of coalitions in the triad. American Social Review, 1957, 22, 406-475.

Witkin, H. A. Individual differences in the perception of embedded figures. Journal of Personality, 1950, 19, 1-15.

Appendix A

Induction for Condition I

POLITICAL DECISION QUESTIONNAIRE

This questionnaire is part of a study of some basic political abilities. There are several parts to the questionnaire and each part has its own instructions. Since various forms of this questionnaire will be given in a number of different classes, we would like the following information.

Name _____

Class in which this questionnaire is given _____

Year in college _____

Major _____

Sex M F

In keeping with the American Psychological Association's Code of Ethics, no information given on this questionnaire will be released at any time except as part of a statistical average which cannot be identified with a person. The answers you give will not be available to your instructor, administrative officers of this university or to investigative agencies for any reason.

PART ONE

A state political party is divided into three strong factions or groups. These groups are designated Faction X, Faction Y, and Faction Z. The party is having a convention. Assume that you are the representative, that is, the floor leader of one of the three factions in the convention.

There are 350 delegates to the convention, and each delegate has one vote. Since the factions in this party are quite strong, all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has 100 delegates (i.e., votes). Faction Y has 150 delegates (votes), and Faction Z has 100 delegates (votes). The major purpose of this convention is to decide how many of 100 political jobs each faction will receive. Each faction would like to get as many of these jobs as possible.

Form I-1a Cont.

It is standard procedure for two factions to get together and agree on the division of the jobs. If these two factions control a majority of the votes of the convention, that is, 176 votes, then the jobs are divided according to their agreement. An alliance between Faction X and Faction Y would have 250 votes. An alliance between Faction X and Faction Z would have 200 votes, and an alliance between Faction Y and Faction Z would have 250 votes.

Assume that you are the floor leader of Faction X (100 votes). Which of the other two factions Y or Z, will you contact first to try to make a deal for the division of the jobs?

Faction Y	Faction Z
(150 votes)	(100 votes)

(Circle one)

What portion of the jobs are you prepared to offer?

What is the smallest portion of the jobs you would be willing to accept in a coalition with this faction leader? (That is what is your rock-bottom low?)

Why did you choose to contact the faction your chose?

What do you expect the other faction leader to demand?

What is likely to be the outcome of the bargaining session? What portion of the jobs do you think you can realistically obtain?

GO ON TO PART TWO.

Appendix B

Induction for Condition II

POLITICAL DECISION QUESTIONNAIRE

This questionnaire is part of a study of some basic political abilities. There are several parts to the questionnaire and each part has its own instructions. Since various forms of this questionnaire will be given in a number of different classes, we would like the following information.

Name _____

Class in which this questionnaire is given _____

Year in college _____

Major _____

Sex M F

In keeping with the American Psychological Association's Code of Ethics, no information given on this questionnaire will be released at any time except as part of a statistical average which cannot be identified with a person. The answers you give will not be available to your instructor, administrative officers of this university or to investigative agencies for any reason.

PART ONE

A state political party is divided into three strong factions or groups. These groups are designated Faction X, Faction Y, and Faction Z. The party is having a convention. Assume that you are the representative, that is, the floor leader of one of the three factions in the convention.

There are 350 delegates to the convention, and each delegate has one vote. Since the factions in this party are quite strong all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has 100 delegates (i.e., votes). Faction Y has 150 delegates (votes), and Faction Z has 100 delegates (votes). The major purpose of this convention is to nominate a candidate to run for the office of governor and a candidate for the office of lieutenant governor. Each faction would like its man to receive the nomination for the governorship, but would not be extremely dissatisfied if its man received only the lieutenant governor's place on the ballot.

Form II-1a

It is standard procedure for two factions to get together and agree on the division of the nominations. If these two factions have a majority of the votes of the convention, that is, 176 votes, then the nominations are divided according to their agreement. An alliance between Faction X and Faction Y would have 250 votes. An alliance between Faction X and Faction Z would have 200 votes, and an alliance between Faction Y and Faction Z would have 250 votes.

Assume that you are the floor leader of Faction X (100 votes). Which of the other two factions, Y or Z, will you contact first to try to make a deal for the division of the nominations?

Faction Y	Faction Z
(150 votes)	(100 votes)

(Circle one)

Which nomination are you prepared to offer them?

Which nomination would you accept as a rock-bottom bargain in a coalition with this faction's floor leader?

Why did you choose to contact the faction you chose?

What do you expect the other faction leader to demand?

What is likely to be the outcome of the bargaining session? What nomination do you think you can realistically obtain?

GO ON TO PART TWO.

Appendix C

Induction for Condition III

POLITICAL DECISION QUESTIONNAIRE

This questionnaire is part of a study of some basic political abilities. There are several parts to the questionnaire and each part has its own instructions. Since various forms of this questionnaire will be given in a number of different classes, we would like the following information.

Name _____

Class in which this questionnaire is given _____

Year in college _____

Major _____

Sex M F

In keeping with the American Psychological Association's Code of Ethics, no information given on this questionnaire will be released at any time except as part of a statistical average which cannot be identified with a person. The answers you give will not be available to your instructor, administrative officers of this university or to investigative agencies for any reason.

PART ONE

A state political party is divided into three strong factions or groups. These groups are designated Faction X, Faction Y, and Faction Z. The party is having a convention. Assume that you are the representative, that is, the floor leader of one of the three factions in the convention.

There are 350 delegates to the convention, and each delegate has one vote. Since the factions in this party are quite strong, all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has 100 delegates (i.e., votes). Faction Y has 150 delegates (votes), and Faction Z has 100 delegates (votes). The major purpose of this convention is to nominate a candidate to run for the office of governor and a candidate to run for the office of lieutenant governor. Each faction would like its man to receive the nomination for the governorship, but would not be extremely dissatisfied if its man received only the lieutenant governor's place on the ballot. Since this party has effectively controlled State government for several years, any man who receives the nomination is virtually assured of winning the general election against the opposition party.

Form III-1a

It is standard procedure for two factions to get together and agree on the division of the nominations. If these two factions have a majority of the votes of the convention, that is, 176 votes, then the nominations are divided according to their agreement. An alliance between Faction X and Faction Y would have 250 votes. An alliance between Faction X and Faction Z would have 200 votes, and an alliance between Faction Y and Faction Z would have 250 votes.

Assume that you are the floor leader of Faction X (100 votes). Which of the other two factions, Y or Z, will you contact first to try to make a deal for the division of the nominations?

Faction Y	Faction Z
(150 votes)	(100 votes)

(Circle one)

Which nomination are you prepared to offer them?

Which nomination would you accept as a rock-bottom bargain in a coalition with this faction's floor leader?

Why did you choose to contact the faction you chose?

What do you expect the other faction leader to demand?

What is likely to be the outcome of the bargaining session? What nomination do you think you can realistically obtain?

GO ON TO PART TWO.

Appendix D

Complete Questionnaire

POLITICAL DECISION QUESTIONNAIRE

This questionnaire is part of a study of some basic political abilities. There are several parts to the questionnaire and each part has its own instructions. Since various forms of this questionnaire will be given in a number of different classes, we would like the following information.

Name _____

Class in which this questionnaire is given _____

Year in college _____

Major _____

Sex M F

In keeping with the American Psychological Association's Code of Ethics, no information given on this questionnaire will be released at any time except as part of a statistical average which cannot be identified with a person. The answers you give will not be available to your instructor, administrative officers of this university or to investigative agencies for any reason.

PART ONE

A state political party is divided into three strong factions or groups. These groups are designated Faction X, Faction Y, and Faction Z. The party is having a convention. Assume that you are the representative, that is, the floor leader of one of the three factions in the convention.

There are 350 delegates to the convention, and each delegate has one vote. Since the factions in this party are quite strong, all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has 113 delegates (i.e., votes). Faction Y has 113 delegates (votes), and Faction Z has 124 delegates (votes). The major purpose of this convention is to nominate a candidate to run for the office of governor and a candidate for the office of lieutenant governor. Each faction would like its man to receive the nomination for the governorship, but would not be extremely dissatisfied if its man received only the lieutenant governor's place on the ballot.

Form II-2b

It is standard procedure for two factions to get together and agree on the division of the nominations. If these two factions have a majority of the votes of the convention, that is, 176 votes, then the nominations are divided according to their agreement. An alliance between Faction X and Faction Y would have 226 votes. An alliance between Faction X and Faction Z woul have 237 votes, and an alliance between Faction Y and Faction Z would have 237 votes.

Assume that you are the floor leader of Faction X (113 votes). Which of the other two factions, Y or Z, will you contact first to try to make a deal for the division of the nominations?

Faction Y	Faction Z
(113 votes)	(124 votes)

(Circle one)

Which nomination are you prepared to offer them?

Which nomination would you accept as a rock-bottom bargain in a coalition with this faction's floor leader?

Why did you choose to contact the faction you chose?

What do you expect the other faction leader to demand?

What is likely to be the outcome of the bargaining session? What nomination do you think you can realistically obtain?

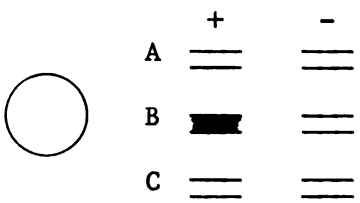
GO ON TO PART TWO.

PART TWO: MACH V. ATTITUDE SCALE

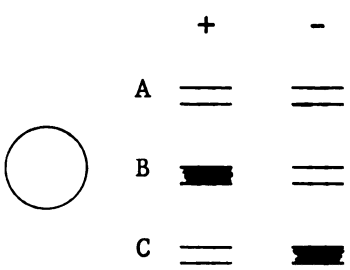
Instructions:

Below are twenty groups of statements. Each group contains three statements labeled A, B, and C. Each statement refers to a way of thinking about people or things in general. The statements reflect opinions, not matters of fact, and different people have been found to agree with different items.

Read the three statements in each group. First decide which of the three statements, A, B, or C, comes the closest to describing your own beliefs. On the red answer sheet, make a mark in the plus (+) space for that statement. This is the way you would indicate that statement B was the closest to what you believe.



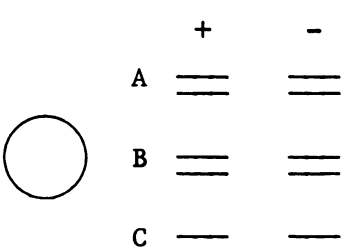
Then decide which of the remaining two statements is farthest from your beliefs. Mark the minus (-) space next to this letter:



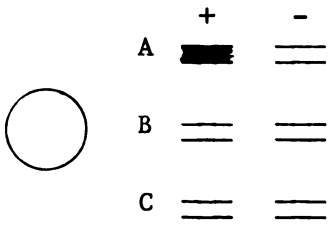
Here is a set of example statements. On the questionnaire you might find these statements:

A. It is easy to persuade people but hard to keep them persuaded.
B. Theories that run counter to common sense are a waste of time.
C. It is only common sense to go along with what other people are doing and not be too different.

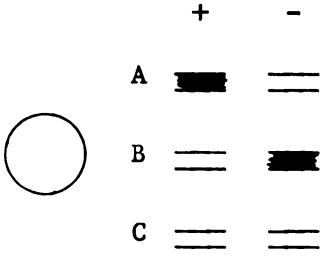
On the answer sheet you will find the answer space next to the circled question number.



If you agreed with A, you would mark your answer sheet like this:



Then, out of the remaining two statements, if you disagreed most with B, you would finish marking the question like this:



Be sure that you have marked one plus (+) and one minus (-) space in every group of three statements. Do not omit any group of statements.

Please answer all of the sets of statements on your answer sheet, not on the questionnaire booklet.

1. A. It takes more imagination to be a successful criminal than a successful business man.

   B. The phrase, "the road to hell is paved with good intentions" contains a lot of truth.

   C. Most men forget more easily the death of their father than the loss of their property.

2. A. Men are more concerned with the car they drive than with the clothes their wives wear.

   B. It is very important that imagination and creativity in children be cultivated.

   C. People suffering from incurable diseases should have the choice of being put painlessly to death.

3. A. Never tell anyone the real reason you did something unless it is useful to do so.

   B. The well-being of the individual is the goal that should be worked for before anything else.

   C. Once a truly intelligent person makes up his mind about the answer to a problem he rarely continues to think about it.

4. A. People are getting so lazy and self-indulgent that it is bad for our country.

   B. The best way to handle people is to tell them what they want to hear.

   C. It would be a good thing if people were kinder to others less fortunate than themselves.

5. A. Most people are basically good and kind.

   B. The best criteria for a wife or husband is compatibility--other characteristics are nice but not essential.

   C. Only after a man has gotten what he wants from life should he concern himself with the injustices in the world.

6. A. Most people who get ahead in the world lead clean, moral lives.

   B. Any man worth his salt shouldn't be blamed for putting his career above his family.

   C. People would be better off if they were concerned less with how to do things and more with what to do.

A. A good teacher is one who points out unanswered questions rather than gives explicit answers.

B. 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 might carry more weight.

C. A person's job is the best single guide as to the sort of person he is.

8. A. The construction of such monumental works as the Egyptian pyramids was worth the enslavement of the workers who built them.

B. Once a way of handling problems has been worked out it is best to stick with it.

C. One should take action only when sure that it is morally right.

9. A. The world would be a much better place to live in if people would let the future take care of itself and concern themselves only with enjoying the present.

B. It is wise to flatter important people.

C. Once a decision has been made, it is best to keep changing it as new circumstances arise.

10. A. It is a good policy to act as if you are doing the things you do because you have no other choice.

B. The biggest difference between most criminals and other people is that criminals are stupid enough to get caught.

C. Even the most hardened and vicious criminal has a spark of decency somewhere within him.

11. A. All in all, it is better to be humble and honest than to be important and dishonest.

B. A man who is able and willing to work hard has a good chance of succeeding in whatever he wants to do.

C. If a thing does not help us in our daily lives, it isn't very important.

12. A. A person shouldn't be punished for breaking a law which he thinks is unreasonable.

B. Too many criminals are not punished for their crime.

C. There is no excuse for lying to someone else.

13. A. Generally speaking, men won't work hard unless they're forced to do so.

    B. Every person is entitled to a second chance, even after he commits a serious mistake.

    C. People who can't make up their minds aren't worth bothering about.

14. A. A man's first responsibility is to his wife, not his mother.

    B. Most men are brave.

    C. It's best to pick friends that are intellectually stimulating rather than ones it is comfortable to be around.

15. A. There are very few people in the world worth concerning oneself about.

    B. It is hard to get ahead without cutting corners here and there.

    C. A capable person motivated for his own gain is more useful to society than a well-meaning but ineffective one.

16. A. It is best to give others the impression that you can change your mind easily.

    B. It is a good working policy to keep on good terms with everyone.

    C. Honesty is the best policy in all cases.

17. A. It is possible to be good in all respects.

    B. To help oneself is good; to help others is even better.

    C. War and threats of war are unchangeable facts of human life.

18. A. Barnum was probably right when he said that there's at least one sucker born every minute.

    B. Life is pretty dull unless one deliberately stirs up some excitement.

    C. Most people would be better off if they controlled their emotions.

19. A. Sensitivity to the feelings of others is worth more than poise in social situations.

    B. The ideal society is one where everybody knows his place and accepts it.

    C. It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.

20. A. People who talk about abstract problems usually don't know what they are talking about.

    B. Anyone who completely trusts anyone else is asking for trouble.

    C. It is essential for the functioning of a democracy that everyone vote.

Now check over your answer sheet to see that you have answered every set of three statements. You should have a total of 20 marks in the plus (+) columns, and 20 marks in the minus (-) columns.

Write your name on the line provided on the answer sheet and mark the appropriate space to indicate your sex.

PART THREE: Topical Inventory
Form N

INSTRUCTIONS

This inventory gives several topics or situations and a number of different ways that people react to them. The reactions are presented in pairs. Your task here is to choose the one member of each pair that most closely fits your opinion or feeling about the general topic. Some of these choices will be easy to make, while others may be rather difficult. All of the choices are statements of opinion or feeling, so there is never any "right" or "good" choice in any pair. If you do not agree with either of the responses in a pair, choose the one that is least disagreeable of the two.

The items in the inventory will be presented like this:

Pair Number

i. When I am confused - - -
   a. I try to find a solution and end the confusion.
   b. I completely ignore the fact that I am confused.

ii. When I am confused - - -
   a. I break out into a nervous sweat.
   b. I remain completely calm at all times

How to respond:

Find space on your purple answer sheet with the same number as the pair number.
It will look like this:

	a	b	c	d	e
i.	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----

Then decide which response, a or b, you agree with most. If you agree most with response a, mark your answer sheet like this:

	a	b	c	d	e
i.	■■■■■	-----	-----	-----	-----
	-----	-----	-----	-----	-----

Make your mark heavy and dark. When you have finished the first item go on to the next. Decide which response most fits you. For example, on pair two if response b, "I remain completely calm at all times" best

describes your behavior, you would mark your answer sheet like this:

ii	a	b	c	d	e
	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----

Be sure to choose only one of the responses in each pair. Do not skip any pair, even if it is difficult to make a decision. Once you have marked your choice for an item, don't go back to it; first impressions are usually the most reliable in this inventory.

There are six situations or topics in the inventory. Each situation or topic his six pairs of responses. Be sure to pick one and only one response from each pair. When you have finished, you should have 36 marks on your answer sheet.

Before you begin, put your name and indicate your sex in the appropriate place on the answer sheet. Work at your own speed, but work straight through the inventory without stopping. Once you have completed an item do not return to it.

Questions 1-6:

Imagine that someone has criticized you. Choose the response from each pair that comes closest to your feelings about such criticism. Indicate your choice by marking either the A or the B space on your answer sheet.

1. When I am criticized - - -

   a. I try to take the criticism, think about it, and value it for what it is worth. Unjustified criticism is as helpful as justified criticism in discovering what other people's standards are.
   b. I try to accept the criticism but often find that it is not justified. People are too quick to criticize something because it doesn't fit their standards.

2. When I am criticized - - -

   a. I try to determine whether I was right or wrong. I examine my behavior to see if it was abnormal. Criticism usually indicates that I have acted badly and tends to make me aware of my own bad points.
   b. It could possibly be that there is some misunderstanding about something I did or said. After we both explain our viewpoints, we can probably reach some sort of compromise.

3. When I am criticized - - -

   a. I listen to what the person says and try to accept it. At any rate, I will compare it to my own way of thinking and try to understand what it means.
   b. I feel that either I'm not right, or the person who is criticizing me is not right. I have a talk with that person to see what's right or wrong.

4. When I am criticized - - -

   a. I usually do not take it with good humor. Although, at times, constructive criticism is very good, I don't always think that the criticizer knows what he is talking about.
   b. At first I feel that it is unfair and that I know what I am doing, but later I realize that the person criticizing me was right and I am thankful for his advice. I realize that he is just trying to better my actions.

5. When I am criticized - - -

   a. I try to ask myself what advantages this viewpoint has over mine. Sometimes both views have their advantages and it is better to combine them. Criticism usually helps me to learn better ways of dealing with others.
   b. I am very thankful. Often I can't see my own errors because I am too engrossed in my work at the time. An outsider can judge and help me correct the errors. Criticism in everyday life usually hurts my feelings, but I know it is for my own good.

6. When I am criticized - - -

   a. It often has little or no effect on me. I don't mind constructive criticism too much, but I dislike destructive criticism. Destructive criticism should be ignored.
   b. I try to accept and consider the criticism. Sometimes it has caused me to change myself; at other times I have felt that the criticism didn't really make much sense.

Questions 7-12:

Imagine that you are in doubt. Choose the response from each pair that comes closest to your feelings about such doubt. Indicate your choice by marking either the A or the B space on your answer sheet.

7. When I am in doubt - - -

   a. I become uncomfortable. Doubt can cause confusion and make one do a poor job. When one is in doubt he should ask and be sure of himself.
   b. I find myself wanting to remove the doubt, but this often takes time. I may ask for help or advice if I feel that my questions won't bother the other person.

8. When I am in doubt - - -

   a. I don't get too upset about it. I don't like to ask someone else unless I have to. It's better to discover the correct answer on your own.
   b. I usually go to someone who knows the correct answer to my question. Sometimes I go to a book which will set me straight by removing the doubt.

9. When I am in doubt - - -

   a. I first try to reason things out and check over the facts. Often I approach others to get ideas that will provide a solution.
   b. I think things over, ask questions, and see what I can come up with. Often several answers are reasonable and it may be difficult to settle on one.

10. When I am in doubt - - -

   a. I realize that I'll have to decide on the correct answer on my own. Others try to be helpful, but often do not give me the right advice. I like to judge for myself.
   b. I usually try to find out what others think, especially my friends. They may not know the answer, but they often give me some good ideas.

11. When I am in doubt - - -

   a. I look over the problem and try to see why there is a doubt. I try to figure things out. Sometimes I just have to wait a while for an answer to come to me.
   b. I try to get some definite information as soon as possible. Doubt can be bad if it lasts too long. It's better to be sure of yourself.

12. When I am in doubt - - -

a. I consider what is best in the given situation. Although one should not rush himself when in doubt, he should certainly try to discover the right answer.
b. I act according to the situation. Sometimes doubt can be more serious than at other times and many of our serious doubts must go unanswered.

Questions 13-18:

Imagine that a friend has acted differently toward you. Choose the response from each pair that comes closest to your feelings about such an action. Indicate your choice by marking either the A or the B space on your answer sheet.

13. When a friend acts differently toward me - - -

a. I am not terribly surprised because people can act in many different ways. We are different people and I can't expect to understand all his reasons for acting in different ways.
b. I am usually somewhat surprised but it doesn't bother me very much. I usually act the way I feel towards others. People worry too much about others' actions and reactions.

14. When a friend acts differently toward me - - -

a. I find out why. If I have doen something wrong I will try to straighten out the situation. If I think he's wrong, I expect him to clear things up.
b. I feel that I may have caused him to act in a different way. Of course, he may have other reasons for acting differently which would come out in time.

15. When a friend acts differently toward me - - -

a. I first wonder what the trouble is. I try to look at it from his viewpoint and see if I might be doing something to make him act differently toward me.
b. It is probably because he has had a bad day, which would explain this different behavior; in other cases he may just be a changeable kind of person.

16. When a friend acts differently toward me - - -

a. It is probably just because something is bothering him. I might try to cheer him up or to help him out. If these things didn't work I would just wait for him to get over it.
b. I try to understand what his different actions mean. I can learn more about my friend if I try to figure out why he does things. Sometimes the reasons may not be very clear.

17. When a friend acts differently toward me - - -

a. There has to be a definite reason. I try to find out this reason, and then act accordingly. If I'm right I'll let him known it. If he's wrong, he should apologize.
b. I usually let him go his way and I go mine. If a friend wants to act differently that's his business, but it's my business if I don't want to be around when he's that way.

18. When a friend acts differently toward me - - -

a. I don't get excited. People change and this may cause differences. It is important to have friends, but you can't expect them to always be the same.

b. I like to get things back to normal as soon as possible. It isn't right for friends to have differences between them. Whoever is at fault should straighten himself out.

Questions 19-24:

Think about the topic of people in general. Choose the response from each pair that comes closest to your thoughts about people. Indicate your choice by marking either the A or the B space on your answer sheet.

19. This I believe about people - - -

a. Whatever differences may exist between persons, they can usually get along if they really want to. Although their ideas may not agree, they probably still have something in common.

b. People can learn from those who have different ideas. Other people usually have some information or have had some experience which is interesting and can add to one's knowledge.

20. This I believe about people - - -

a. People can act in all sorts of ways. No single way is always best, although at certain times a particular action might be wiser than others.

b. Each person should be able to decide the correct thing for himself. There are always a few choices to be made and the individual himself is in the best position to pick the right one.

21. This I believe about people - - -

a. Some people think they know what's best for others and try to give advice. These people shouldn't make suggestions unless asked for help.

b. There are certain definite ways in which people should act. Some don't know what the standards are and therefore need to be straightened out.

22. This I believe about people - - -

a. I can tell if I am going to get along with a person very soon after meeting him. Most people act either one way or another and usually it is not difficult to say what they are like.

b. It's hard for me to say what a person is like until I've known him a long time. People are not easy to understand and often act in unpredictable ways.

23. This I believe about people - - -

a. People have an outside appearance that usually isn't anything like what can be found on the inside, if you search long and hard enough.
b. Each person is an individual. Although some people have more good or bad points than others, no one has the right to change them.

24. This I believe about people - - -

a. People can be put into categories on the basis of what they're really like. Knowing the way a person really is helps you to get along with him better.
b. People are unlike one another in many respects. You can get along with people better and better understand them if you are aware of the differences.

Questions 25-30:

Think about the general topic of leaders. Choose the response from each pair that comes closest to your thoughts about leaders. Indicate your choice by marking either the A or the B space on your answer sheet.

25. Leaders - - -

a. Leaders do not always make the right decisions. In such cases, it is wise for a man to look out for his own welfare.
b. Leaders are necessary in all cases. If a leader cannot make the right decisions another should be found who can.

26. Leaders - - -

a. Leaders cannot provide all the answers. They are like other people --they have to try to figure out what action is necessary and learn from their mistakes.
b. Leaders make decisions sometimes without being sure of themselves. We should try to understand this and think of ways to help them out.

27. Leaders - - -

a. I like a leader who is aware of how the group feels about things. Such a leader would not lead any two groups in exactly the same way.
b. A person should be able to put his confidence in a leader and feel that the leader can make the right decision in a difficult situation.

28. Leaders - - -

a. There are times when a leader shouldn't make decisions for those under him. The leader has the power to decide things, but each man has certain rights also.
b. A leader should give those under him some opportunity to make decisions, when possible. At times, the leader is not the best judge of a situation and should be willing to accept what others have to say.

29. Leaders - - -

a. Some leaders are good, others are quite poor. Good leaders are those who know what is right for the men under them. These leaders deserve the respect of every man.
b. Leaders cannot be judged easily. Many things go to make up good leadership. Most people fall short in some way or another, but that is to be expected.

30. Leaders - - -

a. Leaders are needed more at certain times than at others. Even though people can work out many of their own problems, a leader can sometimes give valuable advice.
b. Some people need leaders to make their decisions. I prefer to be an individual and decide for myself, when possible. Most leaders won't let you do this.

Questions 31-36:

Imagine that someone has found fault with you. Choose the response from each pair that comes closest to your feelings about such a situation. Indicate your choice by marking either the A or the B space on your answer sheet.

31 When other people find fault with me - - -

a. It means that someone dislikes something I'm doing. People who find fault with others are not always correct. Each person has his own ideas about what's right.
b. It means that someone has noticed something and feels he must speak out. It may be that we don't agree about a certain thing. Although we both have our own ideas, we can talk about it.

32. When other people find fault with me - - -

a. I first wonder if they are serious and why they have found fault with me. I then try to consider what they've said and make changes if it will help.

33. When other people find fault with me - - -

a. They have noticed something about me of which I am not aware. Although criticism may be hard to take, it is often helpful.
b. They are telling me something they feel is correct. Often they may have a good point which can help me in my own thinking. At least it's worthwhile to consider it.

34. When other people find fault with me - - -

a. I may accept what is said or I may not. It depends upon who is pointing out the fault. Sometimes it's best to just stay out of sight.
b. I accept what is said if it is worthwhile, but sometimes I don't feel like changing anything. I usually question the person.

35. When other people find fault with me - - -

a. I like to find out what it means; since people are different from one another, it could mean almost anything. A few people just like to find fault with others but there's usually something to be learned.

b. There is something to be changed. Either I am doing something wrong or else they don't like what I'm doing. Whoever is at fault should be informed so that the situation can be set straight.

36. When other people find fault with me - - -

a. I don't mind if their remarks are meant to be helpful, but there are too many people who find fault just to give you a hard time.

b. It often means that they're trying to be disagreeable. People get this way when they've had a bad day. I try to examine their remarks in terms of what's behind them.

Please count the marks on your answer sheet to see that you have made 36 choices, one from each pair.

Appendix E

Machiavellianism and Interpersonal Topical Inventory Scoring Routines

Form II-2b

PART FOUR

This part of the Political Decision Questionnaire is a convention problem somewhat different from the first one. Please work through it without referring to other portions of the questionnaire.

There are 350 delegates to the convention and each delegate has one vote. Since the factions in this party are quite strong, all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has 120 delegates (i.e., votes). Faction Y has 110 delegates (votes), and Faction Z has 120 delegates (votes). The major business of this convention is to nominate a candidate to run for the office of governer and a candidate to run for the office of lieutenant governor. Each faction would like its man to receive the nomination for the governorship, but would not be extremely dissatisfied if its man received only the lieutenant governor's place on the ballot.

It is standard procedure for two factions to get together and agree on the division of the nominations. If these two factions have a majority of the votes of the convention, that is, 178 votes, then the nominations are divided according to their agreement. An alliance between Faction X and Z would have 240 votes, and an alliance between Faction Y and Faction Z would have 230 votes.

Assume that you are the floor leader of Faction X (120 votes). Which of the other two factions, Y or Z, will you contact first to try to make a deal for the division of the nominations?

Faction Y	Faction Z
(110 votes)	(120 votes)

(Circle one)

Which nomination are you prepared to offer them?

Which nomination would you accept as a rock-bottom bargain in a coalition with this faction's floor leader?

What do you expect the other faction leader to demand?

What is likely to be the outcome of the bargaining session? What nomination do you think you can obtain for your faction?

THIS IS THE END OF THE POLYTICAL DECISION QUESTIONNAIRE. Thank you for your cooperation. If you wish to find out the results of studies similar to this one, you may get a copy of one of the reports from the Human Learning Research Institute, 202 Erickson Hall, M.S.U.

Three coding procedures are presented here. SUBROUTINE MACH counts the number of Machiavellian orderings of the items in each of the 20 triplets of Mach V items. AM is an N by 60 array of subjects' responses to each item, where N is the total number of subjects, and the entries are 8.0 for "Agree" and 9.0 for "Disagree". (This coding is dictated by the position of the Mach V response spaces on the machine-score sheet.) BM is an N by 20 array of individual item Mach scores. Sum is an N element vector of total Mach responses.

SUBROUTINE TUCK counts the number of items the subject has endorsed from each of the four complexity system domains. Here AC is a 1 by 36 array of one subject's item responses, BC is a 1 by 4 array of the number of items in each catagory he endorsed, and M is a 2 by 36 matrix containing the scoring Key-the number identifying the complexity system each item represents.

SUBROUTINE CATAG determines whether a subject has any system score which is in the upper 25% of the population distribution. If he has one and only one such score, CATC is set equal the number of the complexity category in which he has the high score.

```
      SUBROUTINE MACH(I,AM,BM,SUM,N,NV)
      DIMENSION AM(1,60),BM(1,20),SUM(N)
C     READ MACH DATA, SUBJECTS TAKEN TO BE ARRAY ROWS
      DO 5 KZ=1,20
    5 BM(1,KZ)=0.0
      READ(52,812)(AM(I,J),J=1,60)
  812 FORMAT(/6X,6CF1.0/)
      DO 10 J=1,60
      IF (AM(I,J).NE.0.0) GO TO 10
      AM(I,J)=8.5
   10 CONTINUE
C     THE ABOVE OPERATION FILLED IN ALL NON RESPONSE SPACES WITH THE MIDPOINT
C     PREFERENCE RANKING IMPLIED BY THE RANK 2 OUT OF 4 PROCEDURE
C
C     THE FOLLOWING OPERATIONS WILL GENERATE BM, THE MACH SCORES FOR
C     EACH TRIPLET OF ITEMS. A HIGH MACH RESPONSE WILL BE SCORED 1.0. A LOW
C     MACH RESPONSE OR AN INCORRECTLY MARKED RESPONSE WILL BE SCORED 0.
   21 IF (AM(I,1).GT.AM(I,5))   BM(I,1)=1.0
   22 IF (AM(I,7).GT.AM(I,11))  BM(I,2)=1.0
   24 IF (AM(I,13).LT.AM(I,17)) BM(I,   3)=1.0
   25 IF(AM(    I,19).GT.AM(I,21))  BM(I,4)=1.0
   28 IF (AM(I,25).GT.AM(I,27)) BM(I,5)=1.0
   30 IF (AM(I,31).GT.AM(I,35))  BM(I,6)=1.0
   32 IF (AM(I,37).LT.AM(I,39)) BM(I,7)=1.0
   34 IF (AM(I,45).LT.AM(I,47)) BM(I,8)=1.0
   36 IF(AM(I,51).LT.AM(I,53)) BM(I,  9)=1.0
   38 IF (AM(I,55).GT.AM(I,57)) BM(I,10)=1.0
   40 IF (AM(I,2).GT.AM(I,4)) BM(    I,11)=1.0
   42 IF(AM(I,10).LT.AM(I,12)) BM(I,12)=1.0
   44 IF(AM(I,14).LT.AM(I,18)) BM(I,13)=1.0
   46 IF(AM(I,22).GT.AM(I,24)) BM(I,14)=1.0
   48 IF(AM(I ,28).LT.AM(I,30)) BM(I,15)=1.0
   50 IF(AM(I,34).LT.AM(I,36)) BM(I,16)=1.0
   52 IF(AM(I,38).GT.AM(I,40))   BM(I,17)=1.0
   54 IF(AM(I,44).LT.AM(I,46)) BM(I,18)=1.0
   56 IF(AM(I,52).GT.AM(I,54)) BM(I,19)=1.0
   58 IF (AM(I,56).GT.AM(I,58)) BM(I,20)=1.0
   60 CONTINUE
C     THIS COMPLETES THE RECODE FOR SUBJECTS I.  THE NEXT OPERATION
C     WILL SUM THE MACH SCORES.
      SUM(NV)=0.0
      DO 70 JJ=1,20
   70 SUM(NV)=SUM(NV)+BM(I,JJ)
C     THIS COMPLETES THE MACH RECODE AND SCORE CUMULATION FOR SUBJ. I.

C     WRITE ROUTINE TO STORE MACH SCORES ON TAPE
      WRITE(51),(BM(I,JJ),JJ=1,20)
      RETURN
      END
```

```
      SUBROUTINE TUCK (I,AC,BC,NV,M)
      DIMENSION AC(1,36),BC(1,4),M(2,36)
  815 READ(52,816)(AC(I,K),K=1,36)
  816 FORMAT(//11X,36F1.0,33X)
      DO 99 MT=1,4
   99 BC(I,MT)=0.0
C     THIS CLEARS THE TEMPORARY COUNTER
      DO 200 K=1,36
      MT=0
      IF(AC(I,K     )-1.0)  200,101,102
  101 MT=M(1,K)
      BC(I,MT)=BC(I,MT) +1.0
      GO TO 200
  102 MT=M(2,K)
      BC(I,MT)=BC(I,MT) +1.0
  200 CONTINUE
      WRITE(53),(BC(I,MT),MT=1,4)
      WRITE(62,201)NV,(BC(I,MT),MT=1,4)
  201 FORMAT(I5,4F10.0)
      RETURN
      END
```

```
      SUBROUTINE CATAG(BC,CATC,N,Z,I,IT)
      DIMENSION BC(1,4),CATC(N),IT(N,4),AVB(4)
     1 ,TEST(4)
      REWIND 53
      DC 400MT=1,4
      SUMBC=0.0
      SSQBC=0.0
      SDBC=0.0
      AVB(MT)=0.0
      DO 300 NV=1,N
      CATC(NV)=0.0
      READ(53),(BC(I,MS),MS=1,4)
      SUMBC=SUMBC +BC(I,MT)
  300 SSQBC=SSQBC+(BC(I,MT))**2.0
      VARBC=SSQBC/(N-1)-(SUMBC**2)/((N-1)*N)
      SDBC=SQRT(VARBC)
      REWIND 53
C    THE FOLLOWING STATISTIC PROVIDES A STES FOR THE
C UPPER 25 PERCENT OF EACT BC(MT) DISTRIBUTION.
C    THIS TEST WILL IDENTIFY PERSONS OF EACH SYSTEM TYPE.
C
      TEST(MT)=Z*SDBC
      AVB(MT)=SUMBC/N
  400 PRINT 5000, VARBC, SDBC, AVB(MT), MT
 5000 FORMAT(5HOVAR= ,F7.3,10X,3H SD,F7.3,2X,10HAVERAGE B=   ,
     1F7.3,7HSYSTEM   ,I3)
C
C
C    THE FOLLOWING PROCESS IS THE TEST ITSELF

      REWIND 53
      DO 600 NV=1,N
      READ(53),(BC(I,MZ),MZ=1,4)
      DO 500 MT=1,4
      IT(NV,MT)=0
      IF((BC(I,MT)-AVB(MT)).GT.TEST(MT))  IT(NV,MT)=1
  500 CONTINUE
      ITS=0
      DO 601 MT=1,4
  601 ITS=ITS+IT(NV,MT)
      IF(ITS.EQ.1) 602,603
  602 DO 604 MT=1,4
      IF(IT(NV,MT).EQ.1)  610,604
  603 CATC(NV)=0.0
      GO TO 600
  610 CATC(NV)=MT
  604 CONTINUE
  600 CONTINUE
      RETURN
      END
```

ITI SCORING KEY[a]

Pair No.	SYSTEM First Item A	Second Item B	Pair No.	SYSTEM First Item A	Second Item B
1.	3	2	19.	3	4
2.	1	4	20.	4	2
3.	3	1	21.	2	1
4.	2	1	22.	1	4
5.	4	3	23.	3	2
6.	2	4	24.	1	3
7.	1	3	25.	2	1
8.	2	1	26.	4	3
9.	3	4	27.	3	1
10.	2	3	28.	2	4
11.	4	1	29.	1	4
12.	2	4	30.	3	2
13.	4	2	31.	2	4
14.	1	3	32.	3	1
15.	3	2	33.	3	4
16.	3	4	34.	1	2
17.	1	2	35.	4	1
18.	4	1	36.	2	3

[a]These items are read in row order into array M of SUBROUTINE TUCK, where they provide a basis for classifying responses.

Appendix F

Instructions for Experiment II

CONDITION I

INSTRUCTIONS

The experiment you will participate in today consists of a series of competitive games. The game you will play will be a political convention game. In this game, a state political party is divided into three strong factions or groups. These groups are designated Faction X, Faction Y, and Faction Z. Each of you will be the representative, that is, floor leader, of one of the three factions in the convention.

There are 350 delegates to the convention, and each delegate has one vote. Since the factions in this party are quite strong, all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has __delegates (i.e., votes). Faction Y has __delegates (votes), and Faction Z has __delegates (votes). The major business of this convention is to decide how many of 100 political jobs each faction will receive. Each faction would like to get as many of these jobs as possible.

It is standard procedure for two factions to get together and agree on the division of the jobs. If these two factions control a majority of the votes of the convention, that is, 176 votes, then the jobs are divided according to their agreement. An alliance between Faction X and Faction Y would have __ votes. An alliance between Faction X and Faction Z would have __ votes, and an alliance between Faction Y and Faction Z would have __ votes.

CONDITION II

INSTRUCTIONS

The experiment you will participate in today consists of a series of competitive games. The game you will play will be a political convention game. In this game a state political party is divided into three strong factions or groups. These groups are designated Faction X, Faction Y, and Faction Z. Each of you will be the representative, that is, floor leader, of one of the three factions in the convention.

There are 350 delegates to the convention, and each delegate has one vote. Since the factions in this party are quite strong, all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has ___ delegates (i.e., votes). Faction Y has ___ delegates (votes), and Faction Z has ___ delegates (votes). The major business of this convention is to nominate a candidate to run for the office of governor and a candidate to run for the office of lieutenant governor. Each faction would like its man to receive the nomination for the governorship, but would not be extremely dissatisfied if its man received only the lieutenant governor's place on the ballot.

It is standard procedure for two factions to get together and agree on the division of the nominations. If these two factions have a majority of the votes of the convention, that is, 176 votes, then the nominations are divided according to their agreement. An alliance between Faction X and Faction Y would have ___ votes. An alliance between Faction X and Faction Z would have ___ votes, and an alliance between Faction Y and Faction Z would have ___ votes.

These cards list the votes controlled by each faction leader. The second card indicates the faction assigned to you.
(Pass out vote distribution and identification cards.)

The convention will proceed like this: First, each of you will fill out a "choice form" to indicate the faction you wish to negotiate with in the first round of negotiations. The form also asks some questions about what kind of offer you are willing to make, and what you think they will accept as a final agreement. This information is for use in the analysis of the study. It does not constitute an actual opening offer or any part of the bargaining process. I will not disclose these answers, but I will tell you if any two of you have chosen to bargain with each other. If two of you have chosen each other (regardless of what offers you intend to make) you will have three minutes to verbally negotiate the division of jobs. The third man will leave the room during the bargaining session. If the two bargainers reach an agreement about the division of the jobs, they will fill out an "agreement form." The third man will be called back, the jobs will be divided according to the agreement, and we will go on to the next game.

If the two bargainers do not reach an agreement during the negotiation period, the third man will be called back and all three of you will fill out another set of choice forms. Another round of negotiation will then follow.

Do you have any questions before we begin?

If not, here are the choice forms. Please pass the form back through the slot in the divider when you have filled it out.
(If a reciprocal choice has been made.)

Factions __ and __ have chosen to negotiate with each other on the first round of negotiations. Faction leader __, would you please step

across the room to 201D. When you shut the door we will begin the three-minute bargaining session. I will come and get you at the end of three minutes.

(To the remaining subjects)

Your task now is to come to some verbal agreement, if you can, on the division of the 100 jobs. Please remain seated while bargaining. You have three minutes.

(Upon reaching anagreement)

Have you reached an agreement? Would you please fill out these forms to record your agreement while I call the other man back.

(With third man present)

As I mentioned before, we will go on to another game when an agreement has been reached. Since you have already played this game, and since two of you have had some bargaining experience, this is likely to affect the way you play the next game. To control for this, we have constructed a questionnaire that presents you with a convention situation somewhat different from the one you just played. We would like you to fill out this questionnaire visualizing your opponents as people you have never met. Don't take them to be the people you played with today. The questionnaire is in three parts. The first is the convention situation, and the second two are attitude scales like others you have taken before. You should finish it with enough time left in the hour to talk a bit about some of the purposes of this study.

(Assign them to different rooms.)

CONDITION III

INSTRUCTIONS

The experiment you will participate in today consists of a series of competitive games. The game you will play will be a political convention game. In this game a state political party is divided into three strong factions or groups. These groups are designated Faction X, Faction Y, and Faction Z. Each of you will be the representative, that is, floor leader, of one of the three factions in the convention.

There are 350 delegates to the convention, and each delegate has one vote. Since the factions in this party are quite strong, all of the delegates in each faction have pledged their votes to the faction leadership. This enables the floor leader of each faction to bargain as the representative of his entire faction. The faction will then vote as a bloc, in line with whatever agreement its floor leader may make. Faction X has ___ delegates (i.e., votes). Faction Y has ___ delegates (votes), and Faction Z has ___ delegates (votes). The major business of this convention is to nominate a candidate to run for the office of governor and a candidate to run for the office of lieutenant governor. Each faction would like its man to receive the nomination for the governorship, but would not be extremely dissatisfied if its man received only the lieutenant governor's place on the ballot. Since this party has effectively controlled state government for several years, any man who receives the nomination is virtually assured of winning the general election against the opposition party.

It is standard procedure for two factions to get together and agree on the division of the nominations. If these two factions have a majority of the votes of the convention, that is, 176 votes, then the nominations are divided according to their agreement. An alliance between Faction X and Faction Y would have ___ votes. An alliance between Faction X and Faction Z would have ___ votes, and an alliance between Faction Y and Faction Z would have ___ votes.

These cards list the votes controlled by each faction leader. The second card indicates the faction assigned to you. (Pass out vote distribution and identification cards.)

The convention will proceed like this: First, each of you will fill out a "choice form" to indicate the faction you wish to negotiate with in the first round of negotiations. The form also asks some questions about what kind of offer you are willing to make, and what you think they will accept as a final agreement. This information is for use in the analysis of the study. It does not constitute an actual opening offer or any part of the bargaining process. I will not disclose these answers, but I will tell you if any two of you have chosen to bargain with each other. If two of you have chosen each other (regardless of what offers you intend to make) you will have three minutes to verbally negotiate the division of nominations. The third man will leave the room during the bargaining session. If the two bargainers reach an agreement about the division of the assignment will fill out an "agreement form." The third man will be called back, the nominations will be divided according to the agreement, and we will go on to the next game.

If the two bargainers do not reach an agreement during the negotiation period, the third man will be called back and all three of you will fill out another set of choice forms. Another round of negotiation will then follow.

Do you have any questions before we begin?

If not, here are the choice forms. Please pass the form back through the slot in the divider when you have filled it out. (If a reciprocal choice has been made)

Factions ___ and ___ have chosen to negotiate with each other on the first round of negotiations. Faction leader ___, would you please step

across the room to 201 D. When you shut the door, we will begin the three-minute bargaining session. I will come and get you at the end of the three minutes.

(To the remaining subjects)

Your task now is to come to some verbal agreement, if you can, on the assignment of the nominations. Please remain seated while bargaining. You have three minutes.

(Upon reaching an agreement)

Have you reached an agreement? Would you please fill out these forms to record your agreement while I call the other man back.

(With third man present)

As I mentioned before, we will go on to another game when an agreement has been reached. Since you have already played this game, and since two of you have had some bargaining experience, this is likely to affect the way you play the next game. To control for this, we have constructed a questionnaire that presents you with a convention situation somewhat different from the one you just played. We would like you to fill out this questionnaire visualizing your opponents as people you have never met. Don't take them to be the people you played with today. The questionnaire is in three parts. The first is the convention situation, and the second two are attitude scales like others you have taken before. You should finish it with enough time left in the hour to talk a bit about some of the purposes of this study.

(Assign them to different rooms.)

CHOICE FORM

I represent Faction X Y Z.
(circle one)

I wish to negotiate with Faction

X Y Z. I am prepared to
(circle one)

offer them _____% of the jobs as

my opening offer. I expect him to

demand _____% of the jobs on a

final agreement.

AGREEMENT FORM

Factions _____ and _____ agree to pool their resources and form a coalition. It is agreed that Faction _____ will get _____ jobs as its share of the convention outcome and Faction _____ will get _____ jobs as its share.