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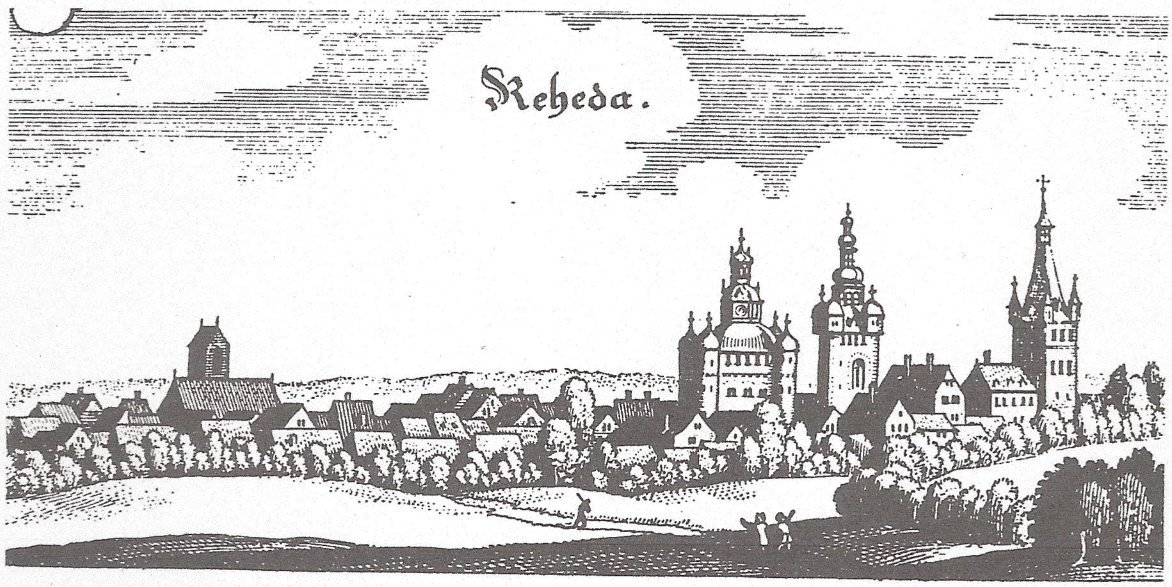

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AMELIORATIVE COALITION BEHAVIOR AND INDIVIDUAL STRATEGIES

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For some twenty years the experimental study of coalition formation has been largely directed to critical examination of the predictions derived from the theoretical perspectives of Shapley & Shubik (1953), Caplow (1956) and Gamson (1961). A substantial body of this research has offered empirical support for Gamson's (1961) <u>Minimum Resource Theory</u> (MRT).[1] Gamson's theory consists essentially of two axioms and one proposition.

The assumptions specify that:

> 1. Participants in coalition situations will expect others in the same situation to hold a "parity norm" -- a belief that payoffs should be distributed in a manner proportional to individual member contributions to a coalition's joint resources.

and

> 2. Participants in coalition situations will attempt to maximize their anticipated share of the coalition outcome.

The consequence of these two assumptions is the prediction that the coalitions which form will be those with the smallest amount of aggregate resources sufficient to control the competitive decision.

Within the supporting research, however, Gamson (1961, 1964), Chertkoff (1966), Nitz and Phillips (1969) and Cole (1969) have identified anomalous coalition strategies. These observations have been explained by reference to particular conditions of the competitive environment in which the goal assumption of Minimum Resource Theory appears to be inadequate. The consequence has been the generation of a number of "competing" theories, all, however, incorporating the parity norm. Psathas and Stryker (1965) and Komorita and

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[1] This research has been reviewed by Gamson (1964), Psathas and Stryker (1965) and Chertkoff (1970). A review of a somewhat broader set of games is found in Selten's (1972) recent theoretical paper.

Chertkoff (1973) note the existence of contradictory explanations of experimental outcomes, but attribute deviations from the predictions of Minimum Resource Theory to differences in the expectancy norms held by competitors in different resource positions.

On the surface such arguments portend starkly conflicting streams of thought. The distinction between these two positions in terms of observable behaviors under identifiable conditions, however, has not been clearly articulated. The present study attempts to develop initial grounds for distinguishing among behaviors which differ in decision rule under a constant expectancy norm. The results of this formulation are discussed in light of a alternative multiple expectancy norm formulation of Minimum Resource Theory.

An important methodological contribution stemming from Psathas and Stryker (1965A). Chertkoff (1966) and Shelley and Phillips (1966) is the partition of the coalition process into conceptually distinct phases. The identification of a pre-negotiation or social contact phase, prior to the selection of a potential bargaining partner or target, and a negotiation phase made possible levels of statistical and experimental control not readily achievable in analyses of coalition outcomes alone.
Particular attention has thus been focussed on the manupulation of conditions in the competitive environment which appear to elicit social contact choices inconsistent with the predictions of MRT. Gamson (1964) first designated situations in which game participants chose to form larger than minimal winning coalitions or accepted payoffs smaller than were due them under the MRT parity norm as anticompetitive. Chertkoff (1966) identified behavior of this sort as a strategy for avoiding the risk of failure associated with forming alliances leading to uncertain outcomes. Cole (1969) attributed the elicitation of "security" strategies in a three person attack game to

uncertainty of the payoff. Subjects in his "truel" were seen to seek coalitions appreciably larger than those needed to maximize expected payoff under conditions of uncertain outcome.

Phillips and Nitz (1968) argued that variations in patterns of social contacts from the predicitons of MRT could not be adequately explained by a "strong" anticompetitive theory. The strong theory held that when the coalition payoff is relatively indivisible (such as nominations to political offices of differing rank), participants would minimize competition over payoff shares which could not be guided by the parity norm by seeking to form coalitions with partners different in level of resources rather than with partners possessing resources equal to their own. Nitz and Phillips (1969) demonstrated a weaker form of anticompetitive hypothesis, namely that some identifiable minority of coalition participants would deviate from MRT choices with changes in payoff divisibility. Since this variation in contact strategy occurred only under circumstances in which the divisibility of outcome could serve as a cue for selecting a coalition with payoff shares to the members compatible with the parity norm, the behavior was labeled an Intra-coalition compatibility strategy.

A third observation of coalition seeking behavior somewhat incongruous with MRT predictions has been offered by Psathas and Stryker (1965). In a three person coalition bargaining simulation, two players took strong resource positions and one took a weaker resource position. They noted that strong players appeared to be responsive to changes in the resources of the weaker player, adjusting counter-offers downward as the weaker player's resources increased from 1 (in the distribution 6-6-1) to 5 (in the distribution 6-6-5). Weaker players, however, were not seen to make such adjustments, but were more likely to retain the same counter-offer even as their own resource position changed. This would not be expected under MRT. Komorita and Chertkoff (1973) interpret this apparent difference in orientations of weak and strong resource positions as suggesting that the weak resource players operate under an equality norm, and that the strong resource players operate under the parity norm.

This interpretation seems at first to justify Komorita and Chertkoff's axiomatization of normative criteria by which players identify payoff maximizing coalitions in the coalition bargining process. The argument is also consistent with the observations of Phillips and Nitz (1968) that preference for contacting a weaker potential coalition partner is apparently weaker in low than in high resource conditions. The "equality norm for the weaker man" argument, though, is inconsistent with the observation of the Nitz and Phillips (1969) study that subjects showed no preference for equality-, as opposed to parity-consistent coalitions when the possibility of equal division was clear.

Each of the three interpretations above contributes propositions which explain reasonably easily rationalized coalition behaviors found to be incongruent with MRT. Thes contributions, though, are somewhat problematic, since each calls upon a different theoretical mechanism. The effects of uncertainty and indivisibility of outcome on the contact process have not been jointly examined. And the interpretations of Psathas and Stryker's (1965) study attend to observations of the bargaining (payoff offers), not the contact process(partner choices). If we refer to the conditions of the latter study most comparable to the situations used by Chertkoff (1966) and Nitz and Phillips (1969) in which no coalitions were prevented (Psathas and Stryker's "unrestricted condition"), we can note two distinctive features of the social contact choices reported there. First, the resource distributions 6-6-1, 6-6-2, and 6-6-5 offer no informative social contact choice based on resources for the weak man. Only the two strong actors can conceivably make choices in which a choice of bargaining partner conveys information about resource preferences. Second, when the data are partitioned by the resources of the weak man, the payoff offer received, and the source of offer, the strong man's contact choices are constant for changes in resources of the weak man within categories of offers received; differences in the strong man's contacts are observed across the classes of offers received.

While the Psathas and Stryker experimental conditions are not wholly comparable with those of the contact studies cited above, this re-examination of their findings raises the question of whether the experiment provides an adequate justification for assuming the utilization of specific equity norms to be conditional only upon resource position.

A fourth issue which arises out of the analysis cited above and is noted in the studies by Geis (1963) and Nitz, Dawson and Phillips (1975) is the prospect that departures from MRT predicted choices may not be simply the consequence of errors or instances supporting competing theoretical formulations. The deviations from MRT observed, for example, by Cole (1969) might be plausibly explained as manifestations of strategies more complex than those identifiable through single binary choices in a single competitive situation. These might be strategies selected by persons with particular normative orientations which are activated under different competitive conditions or strategy preferences predicated on a number of contingent conditions in the competitive environment. Both person-specific and more complex situationally dependent stragegy forms may well go undetected in the analysis of choice or bargaining data at the group or controlled condition level. In many cases the experimenter may actually control a smaller range of circumstances than those required to identify such strategies.

Analysis of treatment conditions in the studies by Gamson (1961b), Chertkoff (1966), Cole (1969) and Phillips and Nitz (1969), among others, have been predicated upon comparisons of differences among means or frequencies across independent treatment groups. Thus particular subjects were often not exposed to more than one of the controlled conditions. Notable in studies in which subjects reacted to several competitive environments (e.g. Geis, 1963; Riker,1965) has been the practice of rotating a group of 9 or 12 participants over each of 3 different three-person coalition games. While this method economically provides measures on each subject under three known experimental conditions, it randomizes experience of the subject (prior success or failure) and that of his opponents across the known experimental manipulations. Thus the behavior of the subject in later steps of a sequence of plays is confounded with his success and that of his opponents in prior stages. Acceptable formulations for more complex strategies have heretofore been limited in the experimental literature.[2]

While the studies cited above demonstrate the utility of specific competitive conditions as predictors of varying strategic behaviors across treatment populations, conditionally normative or multiply contingent strategies of individuals are not thereby explained or excluded.
Finally, the possibility that strategic behavior in uncontrolled interactive games may differ from that in simulations or non-interactive coalition situations must not be overlooked. Although the social contact and bargaining simulation studies have replicated clearly distinct segments of coalition processes, the comparability of the simulation data to that of the corresponding segments of played-out games has not been systematically examined.

The present study attempts to confront the issues of the relative weight of uncertainty and divisibility of outcome on the selection of MRT inconsistent social contact strategies. The study, moreover, seeks to determine these effects across the interactive/non-interactive forms of coalition situations. It provides further for the identification of individual strategies conditional upon the status of two variables in the competitive environment, certainty and divisibility of payoff.

The four alternate individual goals suggested by Nitz and Phillips (1969) as supported or plausibly conjectured extensions of MRT to a more general resource theory are taken here as a starting point for the definition of distinct individual strategies.

1. MAXIMIZATION. Subjects seek to maximize their own share of the payoffs with respect to that of their coalition partners.
2. INTRACOALITION COMPATIBILITY. Subjects will seek to form coalitions in which the division of the

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2 Selten (1972) lays out the conceptual foundations for a game theoretic notion of solution which is clearly open to interpretation as a basis for definition of complex strategies in the sense noted above.

payoff can be negotiated with a minimum of intra-coalition conflict over the division norm.

3. SECURITY. Subjects will seek to maximize their chances of winning by forming the largest coalition possible.
4. COMPETITION. Subjects will seek to form coalitions that allow maximum grounds for intracoalition conflict over the norms of division.

To most efficiently discriminate a subject's presumed goal or strategy from among these four would require two independent binary choices from the subject. That is, if subjects were given choice options of (a or b) and (c or d), then knowing the outcome of the first and second choice options permits the construction of four distinct joint outcomes (ac, ad, bc, bd). Selection of coalition situations appropriate for such discrimination is suggested by the results reported by Psathas and Stryker (1965) and Nitz and Phillips (1969). In the former study the resource distributions of the several conditions correspond to the Type 3 triad according to Caplow's (1956) designation. In this situation, the quantities of resources assigned to players X, Y and Z follow the inequality $n(X) = n(Y) > n(Z)$. In the latter studies Caplow's Type 2 triad was used in addition. Its resource distribution may be expressed by $n(x) = n(Y) < n(Z)$.

Given these resource distributions, the four possible joint contact choices by subjects making decisions in both resource situations may be identified with the choice of a weaker (W), equal (E) or stronger (S) opponent. Thus the possible choices of a player are EW, EE, SW and SE, where the situations are represented in the order (Type 2, Type 3). The strategic significance of these four choice patterns will be examined here in terms of the divisibility of the payoff as outlined in Figure 1. The effects of uncertainty of payoff and nature of interaction is discussed in the design which follows this section.

Figure 1

Theoretical Strategies by Divisibility Condition

	Choice Pattern	Evenly Divisible	Unequally Divisible
(1)	EW	Maximization	Maximization
(2)	EE	Intra-coalition compatibility	Competition
(3)	SW	Competition	Intra-coalition compatibility
(4)	SE	Security	Security

Choice pattern EW ("E" in the Type 2 situation and "W" in the Type 3 situation) suggests an unambiguous individual strategy. Under a parity norm, 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 payoffs.

Two different strategies may be inferred from choice pattern EE, the choice of the equal contender in both Type 2 and 3 triads. Under conditions of easily divisible payoff choosing the equal-resource competitor suggests an explicit payoff division: an equal split. This sort of division might be preferred because of a preference for equalitarianism, a dislike of negotiation a desire to avoid intra-coalition conflict. Under unequally divisible conditions, though, choice of the equal contender would not take advantage of the strategy suggested by the unequal division of the payoff. Thus, such a choice, inconsistent with apparent guidelines for negotiation and with simple maximization strategy suggests competitive motivation. Figure 1 designates the alternative interpretations of this choice pattern in terms of the divisibility payoff conditions.

Choice pattern SW also 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. Under unequally divisible payoffs choosing the unequal resource contender is consistent with the cue value of the payoffs and leads to minimal intracoalition conflict, in accord with the parity norm.

The fourth choice pattern, SE, suggests a security strategy under both certain and uncertain outcome conditions.

In each case the subject selects the coalition in which, under the parity norm, he would take the smallest payoff share of those predicated by the norm in the two possible coalitions.

Under Minimum Resource Theory only one of the four strategy types defined above would be predicated the maximization strategy.

Hypotheses and Design

If the preceeding operationalization of contingent individual strategies is coherent theoretical extension of the foregoing findings, four distinct observations should be experimentally demonstrated. Three may appropriately be taken as hypotheses.

Hypothesis 1. The maximization strategy will be the most frequently selected strategy under all experimental conditions. This hypothesis states that the principle result of all examinations of MRT cited above will be replicated. The second and third hypotheses, suggested by the proposed explanations of MRT-inconsistent strategies address the independent effects of divisibility and certainty of payoff on strategy choice.

Hypothesis 2. Intracoalition Compatibility strategies will be more frequently chosen under conditions or relatively divisible (unevenly divisible) coalition outcomes than under conditions of easily divisible outcomes.

Hypothesis 3. Security strategies will be more frequently chosen under conditions of uncertain outcome than under conditions of certain outcome.

The fourth observation that must be demonstrated is more properly a condition upon Hypotheses 2 and 3 rather than an independent hypothesis: The predicted results should be found whether the coalition situation is interactive or non-interactive in character.

METHOD

Subjects: One hundred-sixty-two male Michigan State University undergraduate psychology students participated in an interactive three person "political convention" game. Two hundred twenty-six other undergraduate students from the social sciences, all males, participated in a non-interactive coalition game with identical substantive format to the first game.

Procedure: The interactive coalition game was patterned after the political convention paradigm used by Chertkoff (1966). Subjects in groups of three were seated at three sides of a partitioned rectangular table,the experimenter occupied the fourth side. The partitions were built with communication slots from each subject to the experimenter. Subjects were randomly assigned to each of the three resource positions X,Y,Z of a Type 2 $[n(X) = n(Y) < n(Z)]$ resource distribution. Instructions and game information were read to the subjects. Subjects were then asked to chose the player with whom they wished to begin negotiations, and to estimate what their initial offer would be. This information was communicated privately in writing to the experimenter. If two subjects made reciprocal choices, the experimenter informed these subjects that they could begin a three minute bargaining period. The third subject waited in another room during the bargaining session. If there were no reciprocal choices or if no agreement was reached in the bargaining phase, a new round of contacts was initiated. (In this study only the initial partner choice is of interest.)

Upon agreement or default, the experimenter announced the outcome and placed the subjects in separate rooms to complete the experiment. Subjects received a questionnaire which contained an attitude scale as a buffer item followed by a non-interactive version (The Political Decision Questionnaire) of the same game, using the Type 3 resource distribution $[n(X) = n(Y) > n(Z)]$. This PDQ contained instructions to treat the players represented as persons distinct from those encountered in the previous interaction game.

In the non-interactive game subjects played the roles of the participants having equal resources in one of the resource conditions of the game described above but made only the social contact choice on a form of the PDQ. The first PDQ was followed by the attitude scale and then by a second PDQ with the alternate resource distribution.

The manipulation of payoff divisibility certainty conditions was achieved through an incomplete factorial design which completely crossed the interactive/non-interactive condition.

Three payoff combinations, Divisible-Certain, Unevenly Divisible-Certain and Unevenly Divisible-Uncertain, thus produced six experimental cells.[3]

Eighteen groups of three persons previously unknown to each other were run in each of the three divisibility-certainty conditions. In each triad the player with the singular resource weight had no meaningful strategic choice but was necessary to complete the group. Fifty-four such subjects were thus excluded from the analysis, leaving 108 subjects in the interactive game. An additional nine triads in each payoff condition were given test-retest versions of the Type 2 resource distribution to provide the basis for statistical control of order effects.[4]

The content of the political convention game for both interactive and non-interactive conditions can be summarized as follows.

Subjects in all three conditions received the following information in each PDQ instrument:

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[3] No Divisibility-Uncertain condition was used since no persuasive expectations of the deviations of subjects' behavior in this condition from MRT had been formed.

[4] This control was selected over complete counterbalancing as an economy measure due to shortage of subjects.
Since the data of interest here are discrete pairs of binary social contact choices, rather than informationally richer bargaining behaviors, such useful controls as regression correction of cell means cannot be applied in the following analysis.

" 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 ___ delegates (i.e. votes), Faction Y has ___ delegates (votes) and Faction Z has ___ delegates (votes)."

Subjects in the Divisible-Certain condition received the following information:

" 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."

" 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."

The following induction was substituted for the preceeding paragraphs for subjects in the Unevenly Divisible-Uncertain conditions to establish a payoff of unequal divisibility:

" 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.

"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."

The Unevenly Divisible-Certain condition added the information that the convention was held in a one-party state in which the party's gubernatorial nominee was also the effective winner of the post in the general election.

All three conditions spelled out the combined strengths of the three possible coalitions: "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."

The forms concluded with the appropriate variant of the instruction: " ... Assume that you are the floor leader of Faction X (___ 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/nominations] Faction Y (___ votes) Faction Z (___ votes).

Resource distributions for the three experimental conditions were counterbalanced over player labels and position. Vote distributions used for the Type 2 and Type 3 conventions are given in Table 1. Forms for each subject were matched on the difference between own (Faction X) votes and those of the player with a different vote assignment.

Table 1

Resource Distribution by Player Label

	Type 2 Triad			Type 3 Triad		
	LABEL			LABEL		
Form	X	Y	Z	X	Y	Z
1	100	150	100	134	134	82
2	100	100	150	134	82	134
3	113	124	113	120	120	110
4	113	113	124	120	110	120

RESULTS

Three subjects in the non-interactive condition and one subject in the interactive condition were dropped from the analysis due to incomplete protocols.

Hypothesis 1 specifies that Maximization strategies will be the most frequently chosen under all payoff conditions. The most conservative test of Hypothesis 2 is provided by the sign test of the difference between the frequency of Maximization choices and the most frequently chosen of the remaining strategies over all six experimental conditions. Inspection of Table 2 indicates that in one of the six experimental conditions the prediction of greater frequency of Maximization responses is not supported. The binominal probability of one or zero failures is 6 trials is p=.109. Since this exceeds conventional confidence levels, Hypothesis 2 cannot be confirmed.

Hypothesis 2 and 3, as understood in the context of the condition that the effects observed be independent of the Interactive Non-interactive condition, specify particular factorial analyses of the responses. In view of the fact that the design was apriori incomplete, the form of analysis used must be an adaptation of Goodman's (1970) methods for the partition of the effects in contingency tables to the case in which the null hypothesis model can at best represent quasi-independence (See Goodman, 1968). Table 3 presents the frequency of Compatibility choices by Interaction, Uncertainty and Divisibility conditions. The test of Hypothesis 2 is straightforward,the hypothesis is consistent with the finding that in Table 3 the conditional interaction effect Divisibility x Strategy, given the joint levels of Interaction and Uncertainty significantly differs from quasi-independence.
The plausible counterhypothesis, that the Uncertainty xx Strategy conditional interaction, given Interactive Group and Divisibility may also be appropriately posed. Both effects are illustrated in Figure 2. Table 3 presents the appropriate corresponding tests of quasi-independence. Only the Divisibility x Strategy effect stated in Hypothesis 2 is supported.

Hypothesis 3 is properly examined in the same fashion but an examination of Table 2 indicates that the frequency of Security strategy choices in several cells is insufficient for stable chi-squared statistics. Rather than permitting the paucity of Security strategies as originally conceived to disconfirm the hypothesized Uncertainty x Strategy conditional effect by default, an a posteriori test seems appropriate.

The parallelism of the Security and Compatibility choices in the non-interactive group might suggest that, at least in this condition, Security and Compatibility strategies in fact constitute a pair of choices in the competitive environment which are not psychologically distinct. (χ^2 for goodness of fit, .59,2df; .80 >p>.70). It might thus be reasonable to combine Security and Compatibility responses as in Table 5.

The effect predicted by Hypothesis 3, that the Uncertainty x Strategy interaction given levels of Interactive Group and Divisibility will depart significantly from quasi-independence is illustrated in the left-hand diagram of Figure 3. The analysis presented in Table 6 does not support the hypothesical interaction. Conversely, the Divisibility x Strategy conditional effect is only slightly weakened by the inclusion of Security along with the Compatibility strategies.

DISCUSSION

The present experiment fails to substantiate the unconditional Minimum Resource Theory expectation of Hypothesis 1 that social contact choices in coalition bargaining situations will be predominantly choices of the pertner at hand. This result was not heretofore anticipated. To be sure, the binominal test of Hypothesis 1 is not a powerful measure and the corresponding p=.109 is not especially decisive as a criterion of rejection. The fact that prior studies, particularly those of Chertkoff (1966), Cole (1969) and Nitz and Phillips (1969) point to conditions in which choice of the MRT strategy is not as predominant as in other conditions should not necessarily lead us to expect the occurrence here of a condition in which preferences are strictly reverse.

The implications of the failure to replicate earlier confirmatory findings that MRT strategies predominate choice patterns must be examined in the context of the strategic paradigm used in this instance. Here the choice patterns designated as strategies are compositions of individual behaviors in distinct resource roles. The datum, then is a record of what an individual has done in two different situations. In the great body of coalition experimentation, however, specifically in the studies cited in the previous paragraph, the datum of interest was taken to be an individual's choice in single decision situations. Thus it is possible to raise the question of whether the coalition strategy behavior observed in the experiment is contingent upon the subjects resource position, on the additional experimental conditions or on both. Hypotheses 2 and 3 speak to these issues.

The test of Hypotheses 2 and 3 examine the first order relationships between one experimentally manipulated factor and subjects' choice of a single strategy given the conditions of the two remaining experimentally manipulated factors. The test of Hypothesis 2, even when taken by the conservative degrees of freedom of quasi independence (1 df is lost for each independent missing cell, here 2 df) clearly demonstrates the dependence of the intracolation compatibility strategy on the divisibility of the coalition payoff: Only in the unevenly divisible payoff situation is there a high overall frequency of compatibility choices. The other possible counter-hypothesis which tests for the independence of strategy choice and certainty of payoff, conditional upon divisibility and interaction group is not supported by the data.

Closer examination of the independent subtables for each of the 2 levels of interactions suggests that the effect observed may also be dependent upon this variable. Because of the incomplete certainty divisibility crossing in the experimental design, though one can say nothing about the further dependence of this effect upon the uncertainty manipulation.

A test of the dependence of Security strategy selection upon uncertainty of payoff could not be formulated so as to be independent of the test of Hypothesis 2 because of the paucity of Security strategies in the interactive experimental condition. The post hoc formulation of the test for Hypothesis 3 used here is, however, particularly illustrative. The prediction that Security (in this case Security + Compatibility) strategies would be conditionally dependent upon uncertainty of the payoff is unsubstantiated. The effect observed, however, the conditional dependence of the combined strategies solely on divisibility is not expected as a consequence of the Chertkoff (1966) and Cole (1971) observations of security seeking behavior. This effect, as seen in the right hand illustration of Figure 3 is appreciably more uniform across interaction groups than is that observed in the corresponding diagram of Figure 2 which illustrates effects under the compatibility hypothesis.

An initial interpretation of the conditional dependence of Security strategies observed here is that both Security and Compatibility choices seen in the non-interactive group are responses to the manipulation of payoff divisibility which are indistinguishable on the basis of the highly restrictive cue value of the situation manipulated. The interactive condition must then be seen as having been inadequately replicated in subtle psycholigical or sociological characteristics by the non-interactive condition. This argument, though, suffers from its inability to persuasively explain the appearance of Security strategies in only one of the interaction conditions, specifically, in the condition with the least interactional information content.

Because the effect observed is conditional upon the interaction manipulation which due to the time restrictions of this experiment is partially confounded with the order of presentation, the possibility that an order effect underlies the appearance of Security strategies must be examined. In a choice experiment in which subjects' opinions and the data derived therefrom are binary, the order of presentation is known to have a clear effect on results, particularly on those expressed as proportions. In an experiment in which the choice option of interest to the experimenter is quaternary it is not at all clear that changing the order of presentation would affect the distribution of the data. Such doubts should be entertained when it is suspected that such an effect is in evidence in only one of the four choice options.

An order effect explanation of the emergence of Security Strategies in the fully counterbalanced non-interactive condition can be offered by constructing plausible "learning" effects.

The non-interactive situation utilizes 2 orders of presentation of resource distributions (Type 2, Type 3) and (Type 3, Type 2), whereas the interactive condition uses only the former. Only two such "learning" effects are reasonable in the reversed (Type 3, Type 2) situation. In the second decision the subject "learns" to choose either the smaller (in the Type 2 distribution the equal) partner or the larger (the unequal) partner. Both possible order-effect induced changes in the four choice patterns can be easily described for the unequally divisible condition under discussion here. If subjects after the first decision opted to choose the weaker man on the second decision, then the original choice patterns EW, EE, SW and SE would appear EW, EE, EW, EE, respectively. [The order of presentation in the second set is reversed (Type 3, type 2) although the choice designations are here written to conform to those of the (Type 2, Type 3) order used throughout this discussion.] None of the changes under the "choose the weaker man" strategy results in the generation of Choice pattern SE which has been nominally designated the security strategy. The second possibility that the subject prefers to choose the stronger partner in the second decision situation results in the pattern SW, SE, SW and SE. Here Maximization (EW) choices disappear completely, being replaced by compatibility and Security choices alone. A restriction of the hypothesized order effect to only those subjects who chose a stronger partner in the first decision would clearly be more compatible with the data. Such a restriction, however, renders a post-hoc hypothesis distinctly different from what would normally be understood to be a simple order effect.

The security strategies found in the non-interactive condition can be accounted for in terms of an easily describable order effect. The effect necessary for this explanation, however, does not seriously compromise the observed choice patterns' plausibility as a coherent goal directed strategy of coalition formation. The proposal that after the experience of one decision subjects will choose the partner with the largest resource base must be taken as a security argument.

The fact that this potential order effect appears and the failure to induce strategic consequences with the uncertainty manipulation in a political coalition paradigm suggest the need for serious reconsideration of the adequacy of such manipulations in this particular experimental scenario. It may not be possible to effectively manipulate subjects' expectations about the uncertainty of events without proceeding through an informationally rich play-through of the risk element of the situation.

The positive findings of the present study, namely that the induction of relatively indivisible payoffs predicates the emergence of a strategic choice pattern not found under similar conditions with easily divisible payoffs, suggests the strong situational dependence of coalition choices under a resource theory. It is this situational dependence, though, that makes the appreciably simpler theoretical formulations such as the small-man-equality-norm/large-man-parity-norm proposed by Komorita and Chertkoff (1973) more difficult to justify by experimental observations. There is little question that these norms of play are especially useful bargaining entrées. But for the subject to use such norms optimally they must be taken as expectations about the demands of potential partners. If this is done, then in the present study the only choice pattern one should expect is EW, the Maximization choice. Here the subject is choosing in each resource distribution the partner whose likely demand is the smaller of the two. The choices of subjects in the present experiment clearly do not support this expectation. Thus for all their merits as a predictor of offer behavior in a plausible bargaining theory, the Kormorita-Chertkoff norm hypotheses do not seem to adequately capture the perceptual or expectation formation processes underlying the selection of such bidding tactics.

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Table 2

Frequency of Strategy Selection by Interaction and Payoff Conditions

Strategy Type

Interaction Condition	Payoff Condition	Maximization	Competition	Security	Compatibility
Non-Interactive Group	Evenly Divisible/Certain	38	6	6	9
	Unevenly Divisible/Certain	45	4	13	19
	Unevenly Divisible/Uncertain	52	7	12	12
Interactive Group	Evenly Divisible/Certain	21	7	3	5
	Unevenly Divisible/Certain	17	2	1	18
	Unevenly Divisible/Uncertain	19	1	2	11

Table 3

Frequency of Compatibility v. Other Strategy Choices by Interaction, Uncertainty and Divisibility Conditions

Experimental Condition[a]	Strategy Coice		Other	Compatibility
Non-Interactive Group	Certain	ED	50	9
		UD	62	19
	Uncertain	ED	-	-
		UD	71	12
Interactive Group	Certain	ED	31	5
		UD	20	18
	Uncertain	ED	-	-
		UD	22	11

a ED = Evenly Divisible Payoff
UD = Unevenly Divisible Payoff

Table 4

Factorial Analysis of Quasi-Independence of Table 3[a]

Null Hypothesis	Estimate of Expected Frequencies[b]	df.[c]	χ^2	p
Divisibility x Strategy/ Group $\cap$ Uncertainty	$\hat{F}_{ijkl} = \frac{f_{ijk.} \cdot f_{ij.l}}{f_{ij..}}$	2	11.71	$\leq .005$
Uncertainty x Strategy/ Group $\cap$ Divisibility	$\hat{F}_{ijkl} = \frac{f_{ijk.} \cdot f_{i.kl}}{f_{i.k.}}$	2	3.42	$.25 > p > .10$

a After Goodman (1970).

b Here the dot in the subscript $f_{ijk.}$ denotes summation over the omitted index 1.

c After Goodman (1968). Here one degree of freedom is lost for each independent a priori empty cell.

Table 5

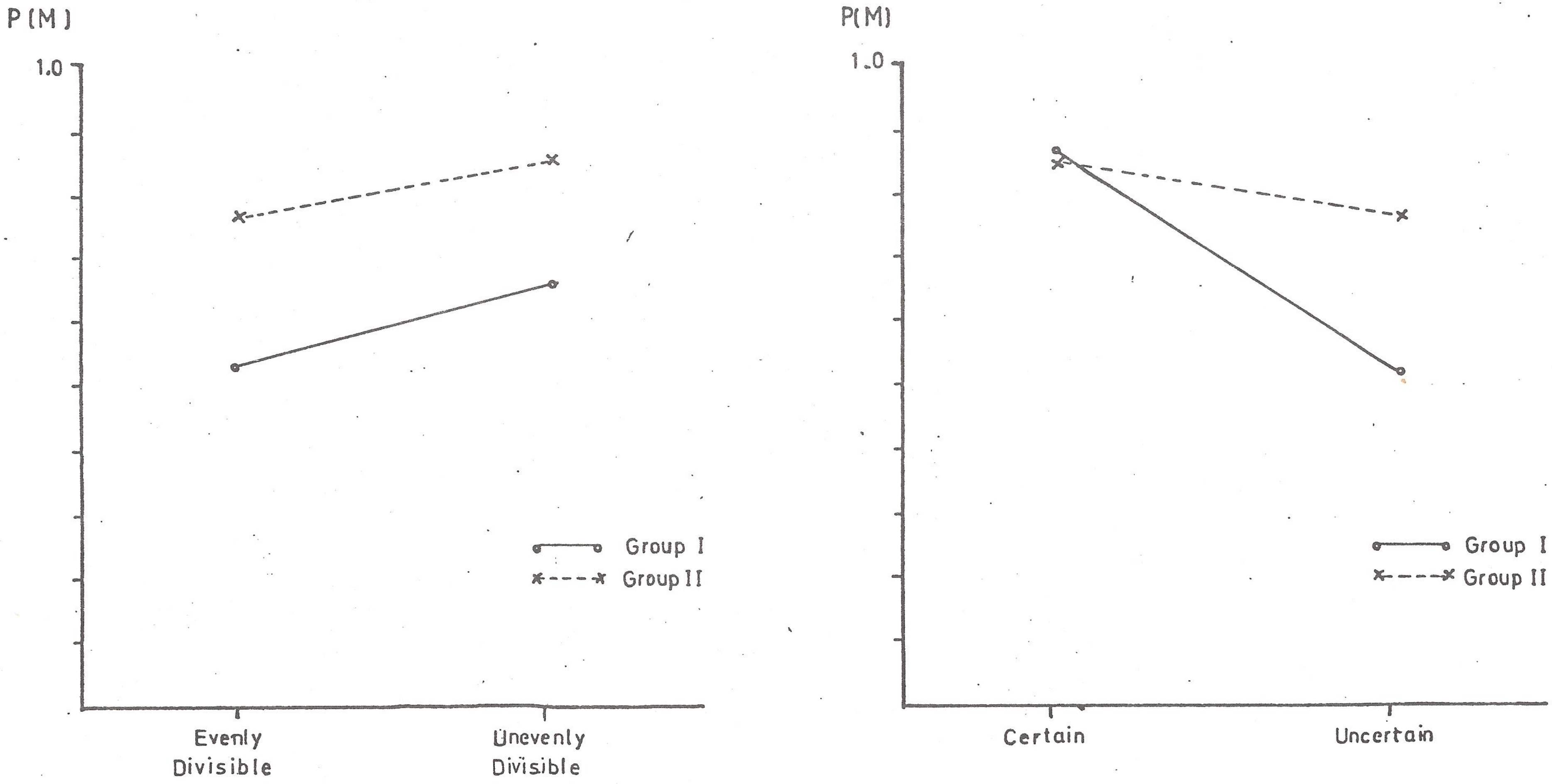
Frequency of Compatibility and Security v. Other Strategy Choice by Interaction and Divisitility Conditions

Experimental Condition[a]	Strategy Choice		Maximization or Competition	Security or Compatibility
Non-Interactive Group	Certain	ED	44	15
		UD	49	32
	Uncertain	ED	-	-
		UD	59	24
Interactive Group	Certain	ED	28	8
		UD	19	19
	Uncertain	ED	-	-
		UD	20	13

Table 6

Factorial Analysis of Quasi-Independence of Table 5

Null Hypothesis	Estimate of Expected Frequencies[b]	df	χ^2	p
Uncertainty x Strategy / Group $\cap$ Divisibility	$\hat{F}_{ijkl} = \frac{f_{ijk.} \cdot f_{i.kl}}{f_{j.k.}}$	2	3.15	.25>p7.10
Divisibility x Strategy / Group $\cap$ Uncertainty	$\hat{F}_{ijkl} = \frac{f_{ijk.} \cdot f_{ij.l}}{f_{ij..}}$	2	9.21	.01



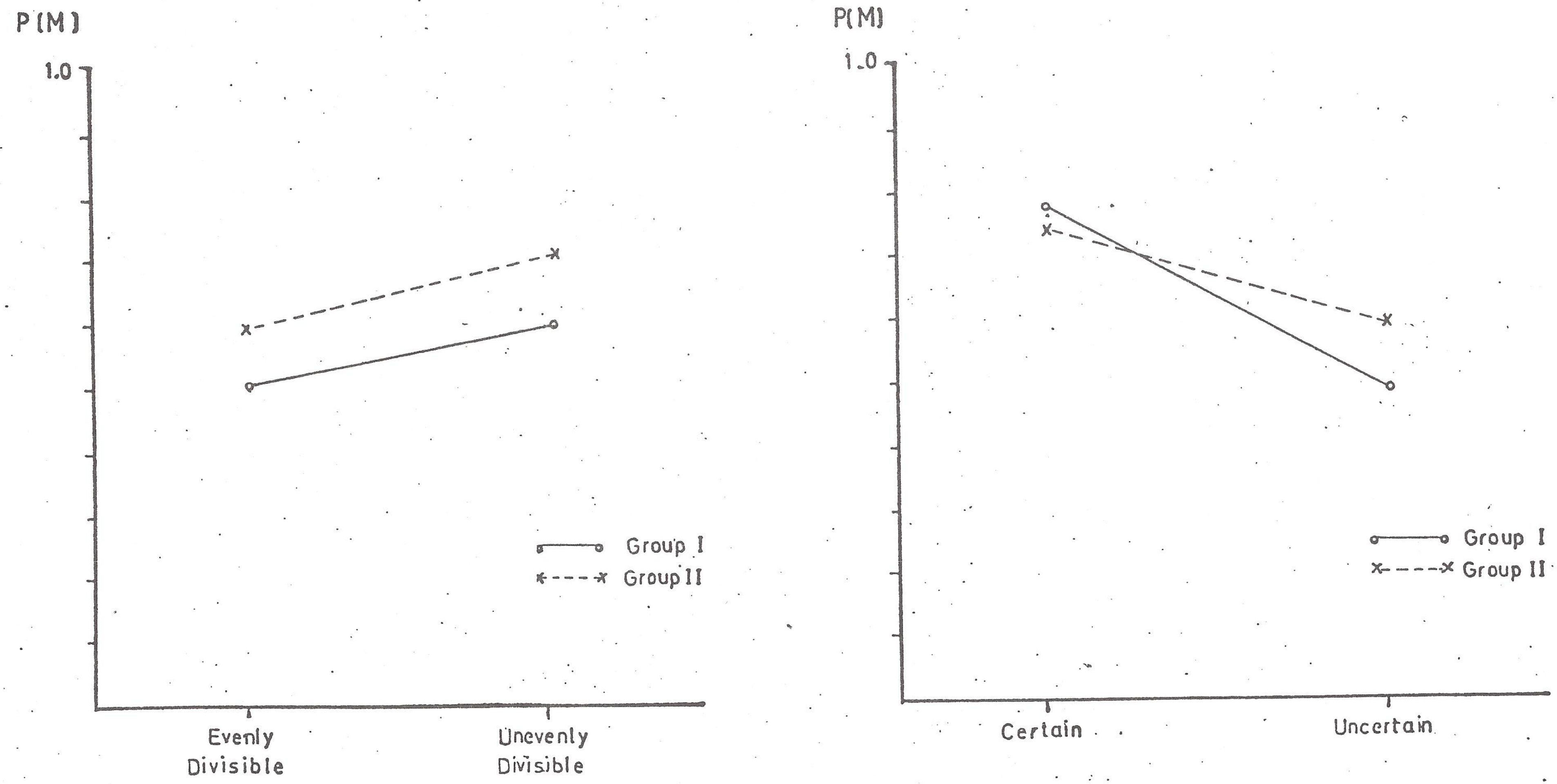
UNCERTAINTY × STRATEGY | GROUP ∩ DIVISIBILITY

DIVISIBILITY × STRATEGY | GROUP ∩ UNCERTAINTY

$P(\tilde{M})$= P(Compatibility)

P(M)= P(Maximization ∪ Competitive ∪ Security)

FIGURE 2



UNCERTAINTY x STRATEGY | GROUP ∩ DIVISIBILITY

DIVISIBILITY x STRATEGY | GROUP ∩ UNCERTAINTY

$P(\tilde{M}) = P(\text{Security} \cup \text{Compatibility})$

$P(M) = P(\text{Maximization} \cup \text{Competition})$

FIGURE 3