Models of Cooperative Group Decision-Making and Relative Influence: An Experimental Investigation of Family Purchase Decisions*

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A conceptual framework is developed that provides a description of group decision-making processes in conflict situations. Selected implications of this framework as it applies to family purchase tasks are tested using experimental data provided by couples making sequences of product choice decisions. Models tested include power-related resources and power use-related goals as determinants of relative influence. Results indicate that relative preference intensity and the outcomes of preceding joint decisions consistently made the strongest contributions to relative influence.

Many purchase decisions are made by families and organizations rather than by individuals. This realization has motivated consumer behavior researchers to develop conceptual models of the group decision-making process (Sheth 1974; Webster and Wind 1972) and empirical studies on such topics as who is involved in purchases (Davis and Rigaux 1974; Silk and Kalwani 1982), decision role structure (Davis 1976; McMillan 1973), and the determinants of relative influence (Kriewall 1980; Thomas 1982). However, limited progress has been made in testing descriptive models of group purchasing and relative influence, especially those with strong theoretical bases.

The objectives of this research are to:
1. Present a conceptual framework for conflict resolution and relative influence in cooperative groups.
2. Specify models that examine some of the basic implications of the framework.
3. Perform an exploratory test of these models on existing cooperative groups (families) making realistic consumption decisions as an initial indication of the framework's ability to represent group decisions.

The conceptual framework suggests many factors that are important to relative influence, some of which have been largely neglected or examined in relative isolation in research on small group decision-making and conflict resolution. As others have observed (Greenhalgh, Neslin, and Gilkey 1984; Rubin and Brown 1975), more comprehensive investigations of these traits are needed to understand their relationships and joint effects on the process of conflict resolution. In particular, Little (1986) suggests that priority should be given to research on decision-making over time. This article incorporates the effects of past decisions on subsequent decisions into both the conceptual framework and the tested models.

Despite the many studies that have appeared in the literature on family decision-making (e.g., Burns and Granbois 1977; Filiatrault and Ritchie 1980; Munsinger, Weber, and Hansen 1975; Olson 1969; Spiro 1983), only a few researchers have tested empirical models of the family decision-making process. For example, Kriewall (1980) estimated a weighted linear model and modeled the estimated weights as functions of objective member characteristics. Although Krishnamurthi (1981) did not investigate the contributions of personalities and interpersonal relationships, he proposed variations on the weighted linear model that allow a member's stake in the decision outcome to contribute to his or her relative influence.

Similar observations may be made about other areas of research on group consumption decisions. In the organizational buying literature, few empirical investi-
gations include individual and group traits (Thomas 1982), and few empirical models have even been proposed (Choffray and Lilien 1980). In recent work by Corfman, Lehmann, and Steckel (1986), linear models that incorporate a limited number of personal traits are estimated using data from ad hoc groups.

The majority of the work on conflict resolution in social psychology (upon which much of the conceptual framework presented here is based) has involved the use of highly controlled experimental games using ad hoc groups (e.g., Deutsch 1973; Tedeschi, Schlenker, and Bonoma 1973). The results made significant contributions to understanding how people behave in these settings, but generalizations to real-world settings may not be justified (Wachtel 1980; Zartman 1977). The research presented here moves in the direction of greater realism by testing some of these findings with real couples making routine decisions and measuring (rather than manipulating) individual and group preferences and traits.

CONCEPTUAL FRAMEWORK

The focus here is on cooperative groups in conflict situations resolved by the use of power. A cooperative group is one whose members' primary goals are compatible (Corfman 1986; Simon 1957). For example, the primary goals of family members are all likely to concern affiliation, security, and trust. We define power as the ability of one person to change another person's attitudes, beliefs, or behavior in an intended direction. Power is possessed in relation to another person as suggested by social exchange theory (Emerson 1972; Kelley and Thibaut 1978) and the related dependence approach to bargaining theory (Bacharach and Lawler 1981). Contrary to the attribution theory view (Schopler and Layton 1974; Simon 1957), power need not be used to be possessed; it is potential. The exercise of power is an act of changing a person that may or may not be deliberate. This is consistent with French and Raven's (1959) descriptions of referent and legitimate power and in direct opposition to Dahl (1957) who views the use of power as exclusively deliberate. Influence is defined as the result of the (active or passive) use of power—the effect or outcome (Coleman 1973).

An outline of the conceptual framework1 for a two-member group (which is easily generalized to larger groups) appears in Figure A. This suggests that the outcome of a group decision is a weighted function of the group members' individual preferences. The weights are determined by the relative influence of the members—each individual's influence over the other. Member A's influence over member B is a function of the influence A attempts to exert and those "passive" power sources s/he possesses. The amount of influence depends on how B responds to the situation based on assessing whether the expected costs of noncompliance outweigh the expected benefits.

The Influence Attempt

The kinds of power member A attempts to exert will be the combination that gives A the greatest expected return. Member A will consider three factors in this cost versus benefit analysis: (1) the potential effectiveness of attempted use of the various power sources A feels are at his/her disposal, (2) the costs associated with their use, and (3) the value of successfully influencing B. Details of this process are depicted in Figure B and are discussed below.

Power Use Effectiveness. A's estimate of power use effectiveness is a function of the resources A believes are at his/her disposal, such as expertise, status, credibility, and ability to reward (French and Raven 1959; Giffin 1967; Tedeschi et al. 1973). In evaluating B's

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1Greater detail on the conceptual framework is provided in Corfman (1986).
probable response, A will consider the image B has of A and B's goals, both of which will affect how B will respond to a given influence attempt.

Cost of Using a Power Source. A's willingness to use each kind of power is, in part, a function of estimating the cost of using each source. There are three kinds of costs. First, some resources are objectively more expensive to use than others either because they are not renewable in the short term (e.g., falsely promising rewards, giving promotions, or breaking kneecaps), or because they are procured with resources that are not immediately renewable (e.g., money for gifts or bonuses). These resources operate in the spirit of a force depletion model (March 1966) and decrease with use. The second kind of cost results from personal goals such as the desire to avoid conflict, be liked, observe social norms, or preserve the relationship (Bacharach and Lawler 1981; Blood and Wolfe 1960; Davis 1976; Park 1982). If, for example, A values acceptance highly, s/he will consider destructive kinds of power such as coercion more "costly" to use than other kinds. The final cost is due to the group's decision history: the payoffs a group member has received in the past relative to those received by the other member(s). In many situations alternatives are not available on a continuum from one individual's preference to another's, making compromise on a single decision impossible. Consequently, the group may compromise over a set or sequence of decisions to maintain overall equity or fairness (Davis 1976). This is the motivation behind equity theory (Adams 1965) and is related to Sheth's (1974) concept of distributive justice in bargaining. If equity is a motivation in the exchange, and member A has "won" more frequently in the past, it will be more costly to A's sense of fairness to exert influence of any kind.

Benefits of Using a Power Source. Member A determines the value of a successful influence attempt using two kinds of information. The first is the task goal or payoff associated with the decision itself. A's intensity of preference for an alternative is an indication of how highly s/he values the task goal (Coleman 1973; Sheth 1974). The second is the payoff associated with such personal goals as winning, getting one's way, and influencing another member, regardless of which alternative A prefers (Deutsch 1973; Greenhalgh et al. 1984). Both of these payoffs may be influenced by the group's decision history. Corfman et al. (1986) found that subjects in an experiment expressed more extreme preferences if they lost in the preceding conflict. This may happen because the preferred outcome is actually valued more highly or because the individual now values winning more highly. Decision history can also have an addictive effect on an individual: winning becomes more desirable once it occurs.²

Passive Resources

In addition to resources member A may actively attempt to use, s/he may have resources that, in some situations, need only be possessed to have an effect. Examples include attractiveness, status, and physical strength (Collins and Guetzkow 1964; French and Raven 1959). If member B infers their presence, such resources as ability to reward and expertise may exert influence even if no action is taken by member A.

Effectiveness of the Influence Attempt

The final component of the conceptual framework is the effectiveness of the influence attempt and any passive resources. B's response to A's actively or passively used resources and, hence, their effectiveness will be determined by the expected value B estimates for compliance. Similar applications of decision theory to social influence processes have been made by several social psychologists (Gerard 1965; Tedeschi et al. 1973). The expected value of compliance is determined by three

²It is important to distinguish the history effect from logrolling. With logrolling, the fact that a decision is one of several in a sequence is only important in helping to establish the value of that decision relative to the others. The decision order does not matter. Independent of logrolling behavior, the individual may also value the payoff more or less due to past decision outcomes, making the order an important issue.
factors. The first factor is B's estimate of the penalties that can result from noncompliance. The penalty may be actively imposed by member A as a punishment or simply felt by B as a result of noncompliance. Examples of the latter include feeling in error due to resisting expertise or feeling dissimilar to a referent object. The second factor in this evaluation is B's estimate of the probability that the penalty will be imposed or felt, either due to A's actions or B's reactions. Finally, B estimates the benefits of noncompliance: what is gained by resisting A.

Decision history may also affect B's estimate of the benefits of noncompliance. If A has won in the past using a nonrenewable power source, as March's (1966) force depletion models imply, B will reduce the estimate of the penalty that can be imposed. Alternatively, if A has won in the past, B may feel the benefits of noncompliance are not as great. As a result, A's chances of winning will be improved. When used to acquire resources that enhance it, use of power can also lead to greater power (Hickson et al. 1986). Support for effects of this type is found in March's (1966) force-conditioning models and in the literature on the stability and reinforcement of leader identity (e.g., Gray and Mayhew 1970).

Summary

The constructs that determine relative influence can be divided into two categories: power-related resources and power use-related goals. The first corresponds to passive influence and the part of A's influence attempt in which s/he estimates power use effectiveness (e.g., expertise, referent status, and bargaining skill). The second corresponds to the costs and benefits of exercising power and are either personal goals (e.g., desire to avoid conflict and to be liked) or task goals (e.g., involvement and stake in the outcome).

While having more of a resource may always be better, and having a particular goal may always increase the use of resources, the effect on influence may be nonlinear. For example, the advantage of increasing expertise may diminish the more expert the member becomes. In other words, group members may derive decreasing marginal returns from increases in the possession of resources and goals.

The conceptual framework presented briefly here provides a structure for understanding the actions and responses of individuals involved in decision-making, and how these contribute to overall relative influence. To be useful in examining a particular type of group decision, elements of the model must be specified in detail for that group and decision. Different individual traits, relationship characteristics, and goals will be relevant depending on the nature of the group and the task in which it is engaged. The following sections describe constructs, hypotheses, and models designed to test some of the basic implications of this framework for families making sequences of purchase decisions.

HYPOTHESES

The following hypotheses are consequences of the conceptual framework as it relates to couples making decisions and are the aspects of the framework that will be tested here. These are not stated as null hypotheses but as the effects we expected to find.

H1: In general, relative preference intensity is the most important predictor of relative influence in the family setting.

Relative preference intensity is how much more important the task goal is to one of the individuals involved. Not only do individuals who have more intense preferences exert more influence, but those who believe they care less use less influence because their spouses' preferences are important to them (Burns and Granbois 1977), implying that caring intensely is a passive source of power.

H2: In families, the effect of decision history is to equalize gains over time.

This is because couples use their history as a way to compromise over a series of decisions. Due to the bonds that unite primary groups (McCall 1970) and the goals characteristic of primary group members (e.g., desire to support the relationship), we expect families to be concerned with fairness and equity.

H3: Other group member resources and goals contribute significantly to the variation in relative influence not explained by relative preference intensities and decision history.

This is a fundamental consequence of the conceptual framework. The following additional power-related resource and power use-related goal constructs are hypothesized to be important to relative influence in the family setting. References offer theoretical and, in some cases, empirical support for including these traits in models of cooperative group decision-making. Signs indicate the hypothesized effect on relative influence.

Power-related resources

+ Expertise (Blood and Wolfe 1960; Burns and Granbois 1977; Davis 1976)
+ Intelligence and education (Blood and Wolfe 1960; Kriewall 1980)
+ Reward and coercive resources (Davis 1976; Lindskold and Tedeschi 1971)
+ Status in the family (Davis 1976; Filiaratull and Ritchie 1980; Olson 1969)
+ Bargaining skill (Neslin and Greenhalgh 1983; Spiro 1983)
+ Self-confidence (Aronoff and Messe 1971; Rosen and Granbois 1983)
+ Sociability (Carter 1954; Greenhalgh et al. 1984)
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- Avoid conflict and accommodate (Blood and Wolfe 1960; Park 1982; Spiro 1983)
- Be liked and accepted (Greenhalgh et al. 1984)
- Save time
- Have integrity (Giffin 1967; Perreault and Miles 1978)
- Support relationship (Burns and Granbois 1977; Davis 1976; Olson 1969)
+ Win and control (Tedeschi et al. 1973)
+ Interest in decision subject (Burns and Granbois 1977; Davis 1976)

H4: The more of a resource or goal a spouse possesses, the smaller the effect an incremental increase in that resource or goal will have on his/her relative influence.

Spouses will derive decreasing marginal returns to absolute increases in their possession of resources and goals. This property, suggested in our discussion of the conceptual framework, has not been examined in the group decision-making context.

H5: The interaction of preference intensity with possession of each influence-related resource predicts relative influence better than preference intensity and the resources alone do.

This implies that the stronger a member's preferences are—relative to the other member(s)—the greater the effect his/her sources of influence will have and vice versa. The conceptual framework implies that a person is likely to use more influence when s/he cares more about the outcome.

H6: The effect spouses expect possession of a resource or personal goal to have on influence, in interaction with possession of that resource or personal goal, predicts relative influence better than possession alone.

This is because the perceptions and goals of the other group members are important to an individual's evaluation of the probable success of an influence attempt (Coleman 1973). For example, unless a reward is valued by the influence object, the resource is of no use.

The above hypotheses concern the decision-making processes of couples in general. H7a through H7j investigate whether these processes differ from one decision or couple to the next due to variation in characteristics of the decision task and the individuals involved. This allows an initial examination of the generalizability of the model.

H7a, H7b, and H7c concern an individual's stake in the outcome of the decision. When one spouse cares more than the other, preference intensity should largely determine influence, and decision history should be relatively unimportant. When preferences are equally intense, decision history is expected to be the most important predictor of relative influence (H7a). When the cost of the decision is high (H7b) or the couple's household income is low (H7c), the kinds of power used are likely to be more destructive (coercive, for example) than in conflicts in which the expense involved is low in an absolute or relative sense. This is because preferences will be more intense overall when greater expense is involved, making spouses more willing to act in ways that are potentially damaging to the relationship. For example, several studies have demonstrated experimentally that when conflict intensity is low in cooperative situations, subjects prefer to use rewards rather than punishments in their interactions (Miller, Butler, and McMartin 1969).

H7d, H7e, and H7f examine the role of expertise in the influence process. The kind of expertise examined here is due to experience with or knowledge of the decision alternatives. First, there is no evidence to suggest that experts and novices resolve conflict differently; thus, none is hypothesized (H7d). There is, however, reason to believe that the nature of the comparison required to choose between two alternatives affects the importance of expertise in the influence process. When the alternatives (products in this case) are less easily compared because they belong to different product classes, expertise should be a less important source of power (H7e). Johnson (1984) has observed that people move to higher levels of abstraction when comparing items that are not comparable on objective dimensions. This would make specific knowledge about a product less important. Further, when a choice is being made between more and less expensive brands of the same product, expertise should have a stronger effect than when the choice is between two entirely different products (H7f). This is because it is not clear what role expertise in a product class plays in making trade-offs across product classes, while its role is more apparent when trade-offs across brands within a product class are being made.

The last four hypotheses concern the effect of influence patterns of the spouses' marital roles (H7g), education (H7h), number of years married (H7i), and number of children at home (H7j). In families with more traditional roles, we expect husbands to have more influence than wives. No variations in influence pattern are expected with differences in the level of education and stage in the family life cycle.

MODELS

The models described here operationalize the aspects of the conceptual framework to be tested indicated by the hypotheses. The recursive nature of the conceptual framework in Figure A permits reduced form models to be specified that deemphasize intermediate steps and
focus directly on how individual traits (resources and goals) contribute to relative influence.

In modeling relative influence, the amount of trait $k$ possessed by member $j$, $T_{kj}$, is assumed to be important only relative to the amount possessed by the other member(s) of the group. Two ways of making this comparison will be examined here as a test of H4. If $T_k$ is the average of the other members’ possession of the trait and $l$ is the total number of group members, the comparisons are as follows:

\[
\text{Difference model: } X_{kj} = T_{kj} - T_k
\]

\[
\text{Proportion model: } X_{kj} = \frac{T_{kj}}{\sum_{l=1}^{n} T_{kl}}
\]

The intuition behind using the difference is clear. In the two-member case, this is simply how much more of the trait one member has than the other. Thus, a member derives constant returns to changes in the amount of a possessed trait. The proportion implies decreasing marginal returns to changes in $Tk_j$, which H4 suggests is the appropriate measure. The two formulations require the use of intervally and ratio scaled data, respectively.

The models represent the probability that group member $j$ will win (have the alternative s/he prefers chosen by the group) as a function of the members’ relative possession of influence-related traits (resources and goals). The models in (3) and (4) assume that these influence-related traits make independent contributions to a member’s probability of winning.

\[
\text{Difference model: } P(j \text{ wins}) = \beta_0 + \sum_{k=1}^{m} \beta_k (T_{kj} - T_k)
\]

(3)

\[
\text{Proportion model: } P(j \text{ wins}) = \beta_0 + \sum_{k=1}^{m} \beta_k (T_{kj}/\sum_{l=1}^{n} T_{kl})
\]

(4)

Among these traits is preference intensity, $T_{pj}$, which is the value j associates with the alternative s/he prefers. The model in (5) tests H5 and includes the main effects of the linear models plus the interaction of each resource with relative preference intensity ($r$ = the number of resources included in the model). Only the proportion form is used because multiplicative interactions in the difference form produce counterintuitive measures.\(^3\)

\[
\text{Proportion model with interactions: } P(j \text{ wins}) = \beta_0 + \sum_{k=1}^{m} \beta_k \frac{T_{kj}}{\sum_{l=1}^{n} T_{kl}} + \sum_{r=1}^{r} \beta_{k+m} (T_{pj}/\sum_{l=1}^{n} T_{pj})(T_{kj}/\sum_{l=1}^{n} T_{kl})
\]

(5)

METHOD

Subjects

The subjects were 77 couples recruited from church, school, and community groups in a major metropolitan area. They represented a range of family incomes ($25,000 to over $100,000), had differing amounts of education (high school only to multiple graduate degrees), and ranged widely in age (21 to 60 years). Their willingness to participate probably meant that they had stable relationships, which somewhat limits generalizability. Each couple received $10 for participating and the opportunity to win $500 in the products and services they chose in the experiment.

Stimuli

The stimuli were products and services in the $20 to $1300 range and included such items as video cassette recorders, sofa-beds, toaster ovens, ski weekends, maid service, radar detectors, and rowing machines. Even though alternatives were often not comparable on objective attributes, subjects were able to and appeared comfortable enough to make the necessary comparisons. Johnson (1984) reported similar responses to his use of noncomparable stimuli.

Data Collection

An overview of the data collection method appears in the Exhibit. First, questionnaires were delivered to the participating couples to collect data on each spouse as an independent unit. Subjects were instructed to complete all questions alone and not to discuss them with their spouses until the experiment was complete.

The questionnaire had two sections, one about the stimuli and one about the subjects. Unless otherwise indicated, five- or seven-point Likert-type scales were used. In the first section, subjects rated 54 products and services (selected based on a pre-test using a convenience sample of 15 additional couples) on (1) their likelihood of purchase in the next two years (on 100-point scales), (2) the price they would be willing to pay for each (three price levels were used for each item), (3) their interest in the product/service categories represented, (4) their expertise relative to their spouses’ in selecting each stimulus (both 100-point constant sum and five-point Likert-type scales), and (5) the amount of influence they expected to have in decisions about whether to buy each stimulus. The second section asked for self-ratings and ratings of spouses on individual re-

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\(^3\)This inconsistency results because the difference measure is negative when member \(j\) has less of a trait than the other member(s). Consequently, when \(j\) has less intense preferences (than other members) and less of another trait or more intense preferences and more of another trait, the product is positive.
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EXHIBIT

OVERVIEW OF DATA COLLECTION METHOD

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Task</th>
<th>Objective</th>
</tr>
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<tbody>
<tr>
<td>Pre-test</td>
<td>Self-administered version of questionnaire, group task, and post-questionnaire</td>
<td>Reduce stimulus set, refine resource and goal scales, determine realism and clarity of task</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Individual ratings of stimuli, ratings of self and spouse on resources and goals</td>
<td>Create stimulus pairs for group task, measure independent variables</td>
</tr>
<tr>
<td>Group task</td>
<td>Individual ratings of decision stimuli, 12-18 joint decisions</td>
<td>Measure preference intensity, measure dependent variable</td>
</tr>
<tr>
<td>Post questionnaire</td>
<td>Manipulation check and individual perceptions of task realism</td>
<td></td>
</tr>
</tbody>
</table>

The stimulus ratings were used to create 12 to 18 joint decisions for each couple; these decisions were used in the second data collection phase—the group task. Each of the first 12 decisions involved the choice of one item from two alternatives on which the spouses disagreed in the questionnaire (i.e., one spouse preferred one alternative and the other spouse preferred the other). Only decisions that couples reported would be made jointly were used. The price associated with each decision item was the one that the spouse who preferred the item indicated s/he would be willing to pay. Twenty-eight of the couples were asked to make additional decisions concerning which of two prices to pay for a single item. Again, these were based on disagreements as indicated by the questionnaire ratings. Analysis indicates that the process was not different for these decisions.

The group task involved both spouses and occurred in each couple's home an average of 19 days following their completion of the questionnaires. Sixty-two couples completed the group task. As each stimulus pair was presented, each subject rated the stimuli alone by dividing 100 points between the items to reflect his/her personal relative preference. These ratings were used as the preference intensity measures in the models. The subjects were then permitted to discuss the stimuli without experimenter intervention in order to reach consensus on which to acquire and how many points to allocate to the alternatives to represent their likelihood of acquiring each one. This procedure was followed for each of the 12-18 decisions, creating a "decision history" for each couple.

When a couple had made the entire sequence of decisions, each spouse evaluated the realism of the task and provided a manipulation check on earlier instructions that had asked them not to discuss the questionnaire before the group task. Responses indicated that subjects found the task realistic and that they had followed the instructions.

ANALYSIS AND RESULTS

Variables

The dependent variable, \( P(A \text{ wins}) \), was formed using the group's constant-sum point allocations to the alternatives in each decision pair. All independent variables were expressed in relative terms, as either differences or proportions, according to the model variations. Two methods were used to form the proportion measure: the average of the ratings the couple gave to each spouse and each spouse's personal rating (relative to the other spouse). Although both methods were used in estimating the models, the resulting variables were so highly correlated that predictive ability was the same. Average ratings were used in the analyses presented here.

Thirteen resource and personal goal constructs, in addition to decision history, were hypothesized in H3 as being important to relative influence in the family setting. (The fourteenth construct in H3, interest, is related to the task goal.) One of these was expertise in the decision area(s). Constant sum allocations of 100 points between the spouses for each stimulus were used to create an expertise variable for each decision pair, based on the sum of the expertise ratings on the two alternatives for each spouse.*

Fifty-three personality items (100-point constant sum allocations between spouses) and five demographic items were measured to create indices for the other 12 resource and personal goal constructs. These items were factor analyzed to confirm the appropriateness of the measures included in each index. Twelve factors explained 61 percent of the variance. Sixty-four percent of the variables loaded as hypothesized at over 0.5 on factors clearly identifiable as 11 of the above constructs. (The family status items loaded on two strong factors: sex role and income source.) An additional four variables loaded correctly at over 0.4 and were kept in the indices. The items relating to desire to accommodate did form one of the twelve factors, although the avoid conflict items did not appear with them. Bargaining skill

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*Other methods of combining the ratings (product, minimum and maximum) were highly correlated with this form and not analyzed further.
did not load at greater than 0.5 on any of the first 12 factors (as expected since it was a single item) and was retained as a single indicator.

Coefficient alphas for the resulting indices ranged from 0.63 to 0.86, which is acceptable for exploratory research (Nunnally 1967, p. 226). Interindex correlations gave an indication of discriminant validity. Only four index pairs had an interindex correlation of 0.3 or higher, and the average interitem correlations across indices for these pairs were considerably lower than the within-index average interitem correlations.

The formulation of decision history, the final personal goal, varied on two dimensions: (1) the outcome lagged one period (what happened in the preceding decision) or the cumulative experimental history (what happened in all preceding decisions), and (2) it was either binary (whether A won or lost) or continuous (the number of points allocated by the group to the alternative A preferred). The cumulative version was hypothesized to have greater predictive ability than the one-period version because couples, expecting the relationship to continue, can afford to wait for equity (H2a). The binary version was hypothesized to predict better than the continuous version because the outcome of the decision was binary—the spouse either won or lost (H2b). This information should be more memorable than "how much" was won or lost.

Two variables related to the task goal were operationalized: preference intensity and interest. Preference intensity was measured as each spouse's constant sum allocation of 100 points between the alternatives before each joint decision was made. The interpersonal comparison of utility implied with the relative form of this measure appears to be justified by the group members' behavior. In their joint decision-making discussions, subjects appeared to accept each other's expressions of preference intensity and the experimenter observed that the subjects' conclusions on whose preferences were stronger were consistent with the initial point allocations. Interest in each decision category was measured on a seven-point Likert-type scale. The sum of the interest ratings for the categories that the two items in each decision pair represented was used as the interest variable.

Two additional independent variables were included. The number of times the group had chosen one of the decision alternatives in the past was added to account for a possible satiation effect, despite the subjects' awareness that they could not receive more than one item. The items' prices were also included to allow for the possibility that price affected which alternative was chosen.

Model Estimation

Of the 834 decisions made by the 62 couples (12–18 by each couple), only 39 percent were disagreements. This occurred even though the choices were designed for each couple to be disagreements using each spouse's desire to acquire the items (as indicated in the questionnaire). Nonstationarity of preferences is one explanation for this result. Another is presented in Corfman (1985) and involves how preference ratings change due to empathy and the feelings about the outcomes of preceding decisions when subjects know that they will be rating the same items as members of a group.

All models were estimated using the 323 disagreements (observations) and ordinary least squares regression. Although the dependent variable was restricted between zero and one, no constraints were imposed in estimation, which allows for another test of the appropriateness of the models. All predicted values of the dependent variables fell between zero and one, which lends support for the model specification. Results of estimating the models appear in Table 1.

Hypothesis 1. As hypothesized, relative preference intensity was highly significant and made the greatest contribution to relative influence. Caring more gave a spouse more influence either because s/he was induced to use more influence or because it discouraged the spouse who cared less from using it.

Hypothesis 2. Decision history was significant and negative, as anticipated, implying that over the experimental decision sequence spouses tended to distribute the wins equally. The stronger this effect was, the less effect any of the resources or other goals could have. Since couples did not strictly take turns, and total wins were not exactly equally shared, there was variance left for the other independent variables to explain. The binary cumulative variation of decision history predicted slightly better than the others, as hypothesized, implying that most couples were trusting enough to wait for equity (H2a) and that whether a spouse had his/her way was more important than how relatively satisfied s/he was (H2b).

To find out whether the process differed if the effect of history was removed, the model was estimated on initial disagreements only. The only significant parameter estimate was for preference intensity, implying that preferences play an even more important role when there is no decision history of the same type. Experience with the task also had an effect on the amount of time couples took to reach consensus. The later in the sequence a decision occurred, the less time they spent making the decision. In this analysis, decision time was modeled as a function of several task and subject characteristics. Other significant variables indicate that the
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TABLE 1
RESULTS OF MODEL ESTIMATION

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Linear difference</th>
<th>Linear proportion</th>
<th>Main effects</th>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference intensity</td>
<td>.45*</td>
<td>.45*</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>Decision history</td>
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<td>-.13*</td>
<td>-.13*</td>
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<td>.71*</td>
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<td>-.02</td>
<td>.12</td>
<td>-.15</td>
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<td>Reward/coercive</td>
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<td>-.05</td>
<td>-.13</td>
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<tr>
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<td>-.11*</td>
<td>-.02</td>
<td>-.03</td>
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<td>.02</td>
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<td>.13*</td>
<td>-.35</td>
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<td>.55</td>
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<tr>
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<tr>
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<td>.03</td>
<td>.03</td>
<td>.00</td>
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<tr>
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<td>.00</td>
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<tr>
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<td>-.09</td>
<td>-.05</td>
<td></td>
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<tr>
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<td>-.09</td>
<td>-.05</td>
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<td>-.13*</td>
<td></td>
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<tr>
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<td>.14*</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Interest</td>
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<td>.00</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Number</td>
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<td>.01</td>
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</tr>
<tr>
<td>Price</td>
<td>.04</td>
<td>.03</td>
<td>.05</td>
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</tr>
<tr>
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<td>.29*</td>
<td>.29*</td>
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<tr>
<td>Adjusted (R^2)</td>
<td>.26</td>
<td>.25</td>
<td>.23</td>
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</table>

*p ≤ 0.001.
*•p ≤ 0.05.
•p ≤ 0.10.

greater the expense involved in the choice, the more time the decisions took, and that preference intensity had a nonlinear effect on decision time. Decisions took more time when (1) spouses were indifferent and presumably could not decide how to decide, and (2) they cared intensely and were, thus, willing to spend more time and effort to achieve their goals.

Hypothesis 3. The signs of four of the other significant independent variables were as expected: relative expertise, sociability, and desire to win contributed to influence, and desire to support the relationship reduced influence. Two significant coefficients had signs contrary to expectations: sex roles and bargaining skill. There are two apparent explanations for the sex role result. Because the joint decision-making task occurred in the presence of an unfamiliar young female experimenter, it is plausible that husbands and wives who espoused traditional values when filling out the questionnaire alone may have wished to avoid being typed as sexist or unliberated and actually overcompensated by allowing the wife to have more influence. Alternatively, if a traditional husband was not highly involved in the decisions, this effect may have been due to a magnanimous gesture on his part, despite his ability to influence the decisions. One explanation for the negative effect of bargaining skill is that the kinds of tactics people had in mind when they rated themselves on bargaining skill are not effective when couples use them. A small survey was taken in which all but one of the eight people questioned associated exclusively negatively valued words with bargaining skill. If people think that to be skillful at bargaining one must be dishonest and ungenerous, it is not surprising that it has a negative effect on influence in couples.

That so few other independent variables were significant, and these less so than relative preference, underscores the importance of preferences in resolving conflict. This result may have been reinforced by adjustments in preference ratings subjects made in anticipation of the influence they expected their spouses to have in the joint decisions. Davis, Hoch, and Ragsdale (1986) found some evidence that this occurs.

Hypothesis 4. The difference and proportion models did not differ significantly in predictive ability (adjusted \(R^2 = 0.26\) versus 0.25) and both had seven significant parameter estimates. This is not surprising given the very high correlation between the two types of measures. With data in only a limited range, it is hard to distinguish a linear from a nonlinear model.

Hypothesis 5. Adding interactions to the proportion model did not improve its performance (adjusted \(R^2\)
The performance of this model suggests that preference intensity does not operate in couples by encouraging the use of power-related resources, but that it is a source of power in itself. When it is clear which spouse cares more intensely, the outcome is largely determined, not because more or less power of other kinds is being used, but because caring about the choice is a source of power.

**Hypothesis 6.** Contrary to H6, using the interaction between the resource or personal goal and the effect the spouse expected it to have did not increase predictive power, and the number of significant parameter estimates dropped to two. The implication here is that subjects either did not understand the questionnaire item or were not able to give accurate information on how “in a family like yours each of the following traits . . . would affect . . . influence in joint decisions.” Spouses may have had a poor idea of how different resources and goals really relate to influence in their own decisions and reported stereotyped notions. An alternative explanation is that subjects weighted the traits when they rated themselves and each other by spreading the scores on more important resources and goals. This is similar to the results of multiattribute models that show that importance weights make little predictive difference because their information is already included in the ratings of the stimuli on the attributes (Beckwith and Lehmann 1973).

**Hypothesis 7.** The sample was split in 10 ways and the difference model estimated on each subsample to examine whether the decision-making process differed due to the factors discussed in H7a through H7j. Chow tests determined whether significantly more variance was explained by splitting the sample than by estimating the model on the aggregate data.

A significant difference was found in only one case: equally versus unequally intense preferences (H7a). If spouse A’s point spread for a decision pair was within 10 points of spouse B’s point spread, the spouses were classified as having equally intense preferences for that decision. (These preferences could be high or low.) The other group consisted of decisions about which the spouses cared different amounts: one spouse had intense preferences and the other was relatively indifferent. A Chow test on the halves was significant at less than 0.10 ($F = 1.60, df = 20,287$). The model fit much better for the latter group (adjusted $R^2 = 0.39$ versus 0.04). (See Table 2.)

When the spouses’ preferences were of different intensities, relative preference was the strongest determinant of relative influence, as expected, and decision history was not significant. With the exception of sociability, the other independent variables that were significant in the difference model were significant here as well. In addition, intelligence and education, reward and coercive resources, and desire to save time had significant effects. The positive sign of reward and coercive resources here makes sense. When one spouse’s preferences were much stronger than the other’s, that spouse had more justification than the other to use manipulative resources because their information is already included in the ratings of the stimuli on the attributes (Beckwith and Lehmann 1973).

### Table 2

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Equal intensity</th>
<th>Unequal intensity</th>
</tr>
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<tbody>
<tr>
<td>Preference intensity</td>
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</tr>
<tr>
<td>Decision history</td>
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<tr>
<td>Expertise</td>
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<tr>
<td>Intelligence/education</td>
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<td>-0.13</td>
</tr>
<tr>
<td>Reward/coercive</td>
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<td>-0.14</td>
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<td>Sex role</td>
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<td>-0.18</td>
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<tr>
<td>Income source</td>
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<td>0.01</td>
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<tr>
<td>Bargaining skill</td>
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<td>-0.23</td>
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<tr>
<td>Self-confidence</td>
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<td>0.03</td>
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<tr>
<td>Sociability</td>
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<td>0.06</td>
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<td>Be accommodating</td>
<td>-0.03</td>
<td>0.14</td>
</tr>
<tr>
<td>Be accepted</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Save time</td>
<td>0.01</td>
<td>-0.20</td>
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<tr>
<td>Integrity</td>
<td>-0.16</td>
<td>-0.11</td>
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<tr>
<td>Support relationship</td>
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<tr>
<td>Win/control</td>
<td>0.14</td>
<td>0.20</td>
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<tr>
<td>Interest</td>
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<td>0.39</td>
</tr>
</tbody>
</table>

* $p < 0.10$
* $p < 0.05$
* $p < 0.001$
* $p < 0.0001$

At the 0.10 significance level, one test in ten may be significant by chance. Given this result's consistency with our theory and other results, we are inclined to believe it is not significant by chance.
GROUP DECISION-MAKING

esized—the spouse who felt rushed relinquished influence to save time. A possible explanation for the negative sign of intelligence and education is that when one spouse cared intensely, a rational approach was counter-productive (from the influencer’s point of view).

When preferences were equally strong (or weak) relative preference intensity could no longer explain relative influence and, as hypothesized, decision history determined the outcome more than the other factors. Also significant were desire to support the relationship and reward and coercive resources, with signs consistent with earlier findings.

The results of this analysis imply a primary decision rule of the following kind:

1. If preferences are not equally intense, the couple chooses the alternative preferred by the spouse with more intense preferences.
2. If preferences are equally intense, the couple chooses the alternative preferred by the spouse who has had his/her way less often in the past.

Weighted Probability Model. In addition to the models already discussed, a variation on the weighted probability model of group choice was also estimated (Choffray and Lilien 1980). In this model, the probability that the group chooses a given alternative is the weighted sum of the probabilities that each member of the group would choose that alternative if acting independently. As the model was operationalized here, the member weights were linear functions of the traits that determine relative influence (Steckel, Lehmann, and Corfman 1986). For ease of comparison to the linear models, this model was rewritten with the probability that member A wins as the dependent variable, demonstrating its similarity to the linear model with interactions. The weighted probability models predicted the probability of winning less well than the linear models did (adjusted $R^2$ of 0.05 and 0.21, respectively, for the difference and proportion models).

CONCLUSION

From the results of estimating these models we conclude that relative preference intensity and decision history dominated the conflict resolution process. The latter acted to ensure equity and was most important when preferences were equally intense. Expertise, sociability, desire to support the relationship, and desire to win and control also contributed to the balance of influence in couples. The lack of significance of many other traits often cited as important to influence and the resolution of conflict emphasizes the domination of the process by the couples' highly cooperative concern for each other's preferences and for fairness. That use of the proportion model with interactions did not improve predictive ability suggests that preferences affected relative influence directly rather than acting as a spur to the use of other resources. Finally, the results were generally stable across group and decision types. The basic results are summarized in Table 3.

This study has several limitations. First, it examined only two-person groups choosing between two alternatives. Although the models can be generalized to apply to larger groups and choice sets and may be appropriate in some of these situations, this was not tested. A situation that the models cannot accommodate, however, is one in which the group members form coalitions. The study also examined only decisions concerning moderately priced durables and services. The results may not generalize to joint decisions about less expensive, more frequently purchased products, to choices among negative outcomes, or to many kinds of decisions outside the realm of consumer behavior. These are clearly interesting directions for future research.

Further, there are questions relating to the realism of the task. Although subjects reported that they found

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Result</th>
</tr>
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<tbody>
<tr>
<td>H1 Relative preference intensity is the most important predictor of relative influence.</td>
<td>Confirmed</td>
</tr>
<tr>
<td>H2 Decision history equalizes gains over time.</td>
<td>Confirmed</td>
</tr>
<tr>
<td>H2a Couples use a greater than one-period history to equalize gains.</td>
<td>Confirmed</td>
</tr>
<tr>
<td>H2b Couples remember &quot;who won&quot; in the past rather than &quot;how much&quot; was won.</td>
<td>Confirmed</td>
</tr>
<tr>
<td>H3 Other traits affect relative influence.</td>
<td>Confirmed: Expertise (+) Sociability (+) Support relationship (-) Win and control (+) Significant with opposite signs: Sex role (-) Bargaining skill (-)</td>
</tr>
<tr>
<td>H4 Resources and goals exhibit decreasing marginal returns.</td>
<td>Not confirmed</td>
</tr>
<tr>
<td>H5 Interaction of preference intensity and possession of resources improves prediction</td>
<td>Not confirmed</td>
</tr>
<tr>
<td>H6 Interaction of possession of each trait with effect spouse expects it to have, improves prediction.</td>
<td>Not confirmed</td>
</tr>
<tr>
<td>H7 Characteristics of the decision and the couple affect the relative importance of the traits.</td>
<td>Confirmed for equally versus unequally intense preferences.</td>
</tr>
</tbody>
</table>
the task realistic, the decisions were not naturally occurring. The couples did not choose to make these particular decisions. Second, the couples were highly motivated to make decisions, while in "real life" they might put off deciding or decide not to decide. Finally, the presence of a third party during the group task may have had an effect on behavior, despite the subjects' reports to the contrary.

The exploratory nature of this investigation made the comparative testing of different model forms difficult. As the appropriate variables to measure and the instruments themselves became more refined with more modeling in this area, it will be possible to better discriminate among model forms. Although self-perceptions are clearly very important in the exercise of power, as the number of appropriate variables is narrowed down, objective measures of member traits should also be investigated.

It is clear from the results reported here that the conflict resolution process of couples is predominantly cooperative. Specifically, relative preference intensity and decision history are important determinants of relative influence in their decision-making. It is not enough to look at power sources and which alternative an individual prefers in an isolated decision. How much s/he prefers one alternative to the others and the context of the decision in terms of the outcomes of past decisions are critical. For this reason, we cannot assume that there is one person to identify who will always have more influence in a particular kind of decision.

The major contribution of this research is what it adds to the growing body of knowledge on group decision-making. Since it is clear that most major decisions—and even such minor decisions as a choice of a television show or toothpaste—are group decisions, more research of this kind is central to an improved understanding of consumer behavior.

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REFERENCES


