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1977

TRANSFER PRICING - ITS BEHAVIORAL
CONSEQUENCES

by

M. ROBERT ACKELSBERG

A dissertation submitted to the Graduate
Faculty in Business in partial fulfillment
of the requirements for the degree of
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1977

This manuscript has been read and accepted for the Graduate Faculty in Business in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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An experimental simulation such as this is impossible

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from my lack of patience, my unavailability and from
general neglect. I hope that this suffering is forgiven
and the reasons understood. With the completion of this
effort, I know that we will rediscover each other and I
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CHAPTER I

INTRODUCTION

Decentralization is well known to students of management and has been amply described and justified by many diverse authorities from both academic and industrial perspectives. (Cordiner, 1971; Drucker, 1954; Meij, 1955; Sloan, 1963). It is accomplished by breaking up, or decomposing, a larger, complex organization, into smaller semi-autonomous profit centers or "quasi-firms", each with its own set of goals. Decisions, rather than being made primarily in the upper echelons of the hierarchy, are pushed down the organization to that level which can "best" make them.

The managers of these profit centers are given the authority and responsibility to make the decisions that will maximize, or satisfice, their operations, in keeping with the overall objectives of the firm. "It has been recognized that some form of goal factoring and subsequent decentralization arises. This decomposition is a result partially, at least, of the cognitive inability of corporate decision makers to solve efficiently all of the implied relations simultaneously; that is, without a convergent, iterative process to reduce complexity and problem size. (Krouse, 1972, p. 545) In other words, the argument for decentralization is founded in the concept of bounded rationality

(March and Simon, 1958). Thompson (1967) believes that firms decentralize in order to better cope with a changing environment.

Dean (1955) lists four characteristics that a profit center should possess: operational independence and control, free access to sources and markets, separable costs and revenues, management intent.

Decentralization is intended to free the top executives from the day to day operations and enable them to do more long range planning; it is meant to improve the quality and speed of decision making by having those most knowledgeable of problems work on their solutions; it is meant to provide a mechanism to motivate, appraise and develop managers; it is meant to shorten the lines of communication and reduce bureaucratic inefficiencies; it is possibly the only practical design for organizations that have become extremely complex and diverse from the standpoint of markets, technology and geography.

One of the major difficulties with decentralization is that although it is meant to, and probably does, improve the decision making capabilities of the sub-units, this is not always sufficient to ensure that it will also improve the total performance of the firm, since each profit center manager strives to increase his own performance (which is likely to be the basis for his own evaluation and reward) even, if necessary, at the expense of higher goal achievement. This conflict between the goals of the organization

and the goals of the profit centers is the basis for much of the controversy over decentralization - how much authority should be delegated to the profit centers? "Sufficient zone of discretion must be granted to the management of the division so that it will take an entrepreneurial, not a bureaucratic, view of its situation and at the same time, with propriety, be held to account for performance. It must have the power to make decisions . . . that will determine operating results insofar as those are reflected by managerial choices. If a scope of decision making that would meet this test cannot be granted without potentially serious damage to this division, or to the corporation as a whole, then decentralization would be a questionable move." (Heflebower, 1960, p. 12) Actually, the choice is not between decentralization or centralization. Rather it is a choice over a continuum - more or less of either centralization or decentralization.

Since the divisions are judged on profit performance, it is desirable that the measurement of such profit be realistic and unbiased. This offers little problem in those cases where the individual units are completely independent. However, when the units are interdependent, when one unit in the decentralized firm produces and "sells" product to another unit in the firm, then the calculation of divisional profit is not so straightforward. At what price should the transferred goods or services be charged?¹

¹Services are included since maintenance, data processing and research are often set up as profit centers.

Obviously the interests of the two divisions are opposed to each other. In fact, a simplistic view of the transfer price problem might be as a zero-sum game, although, as will be noted, this is precisely how transfer pricing should not be viewed.

The different ways in which transfer pricing is handled in a decentralized firm and the relationship of transfer pricing to organizational behavior is the subject of this research.

Transfer Pricing as a Quantitative Problem

The Vice President of Kaiser Aluminum and Chemical Company noted that the establishment of transfer prices is among the thorniest of corporate problems (Dearden, 1964). It is thorny because of the lack of consensus on the appropriate technique to use, its potential for conflict between buying and selling divisions, and its effect on their continuing relationship. Transfer prices are used to control operations, allocate resources, evaluate divisional performance and thereby evaluate and reward managers, stimulate rational "make or buy" decisions, determine various marketing strategies, and decide whether or not to abandon operations.

There seems to be no one set of transfer prices and no one set of costing that will answer all problems and meet all requirements. Rather, different approaches are used under different circumstances, with most authorities recommending the use of market prices, negotiated prices, or some type of marginal or incremental cost. Each method has to be evaluated on performance measures, resource allocation and goal congruence (Dittman, 1972). Dittman lists four criteria that a performance measure (derived from transfer prices) should meet:

1. Consistent with long term profitability of the firm
2. Expressed in units which are within the control of the sub-unit
3. Not subject to artificial manipulation by the sub-unit

4. Accepted by the managers as a criterion upon which he is to be judged

Mailandt (1975) notes the following requirements for a transfer price system:

1. Easy to manage and administer
2. A way to measure divisional performance
3. Promotes continuous performance improvement
4. Fair and flexible

It will be seen that no transfer price system is likely to completely satisfy all of these requirements. The choice of an appropriate method will likely depend on inter-divisional relationships and the nature of the product being transferred, relative to its availability in the open market. Three product groupings can be identified (Dearden, 1960):

- A - Product never produced by outside suppliers, possibly due to need for secrecy or as a result of company policy
- B - Products for which long term commitments must be made and that require long term investment
- C - Products for which no long term commitments are needed

Dearden suggests that types B and C should be priced at current market prices, with A priced at cost plus a fixed return on investment.

Menge (1961) notes that a large, integrated automobile company classifies their products slightly differently:

- X - Items for which prices of competitive producers are not available; priced at total costs plus reasonable return on investment
- Y - Composed of "split" products, i.e., items purchased from outside suppliers and also

produced within the company; priced equivalent to lowest vendor price, with adjustments when appropriate.

- Z - Items supplied only from internal sources, but which are available from outside suppliers; priced at market prices, adjusted for differences in specifications, volume, services, royalties, freight

Market Prices

When available, market price is the preferred transfer price, but it must be a realistic, competitive price--in other words, it is the price for an adequately traded good or service. This best meets the autonomy needs of the sub-unit (Cook, 1955). Some negotiations could still enter into this pricing procedure, though, since the buying division might want to get the benefit due to any savings in selling expenses, bad debt, packaging, handling, etc. All of these could involve difficult allocation problems. On the other hand, the selling division might want to recover extra costs due to set-ups, small volume, scheduling, special operations. These, too, could involve allocation decisions.

Sometimes the market price is not a real alternative for the buyer, either because of quality, service, location, secrecy, or because meaningful bids are difficult to obtain from suppliers who believe themselves to be unlikely to get the business. Many organizations give the buying division the right to purchase materials from outside sources; thus, the supplying division has to be competitive. There could

be situations where the buying division would prefer, at equal prices, to purchase their requirements from outside sources in order to get better service, gain access to outside technology, and possibly, to hinder or frustrate other competing sister divisions of the company. This could result in suboptimization. If the supplying division is running its facility at capacity and selling in outside markets, any internal sales would have to be diverted from such outside sales and the market price is then an appropriate transfer price. However, if the supplying division is producing at less than capacity, the company is being penalized by outside purchases, since any internal transfer at prices above the incremental cost of the supplying division would increase overall company profit. A superordinate criterion should therefore be used under these circumstances, i.e., maximize (total revenue less total incremental cost).

A variation of the transfer price at market price is transfer at market less a fixed percentage. This has little to offer, since it might not be related to market conditions. In a seller's market, the producing division might be penalized; in a buyer's market, it could be close to competitive market prices (Dean, 1955). There is little incentive for the supplying division to increase efficiency and reduce price, since it is guaranteed a profit margin.

Negotiated Prices

In this approach, the divisions are given the opportunity to set their own prices, based on negotiations--it is an approach that has received some support (Dean, 1955; Haidinger, 1970; Mailandt, 1975; Watson and Baumler, 1975). Dean states that this procedure would tend to create agreement, eliminate causes of friction and avoid arbitrariness.

Mailandt (1975) suggests that the negotiations be carried out within limits set by cost and market price. Once this is negotiated, a "mark-up index" is calculated. This provides a mechanism whereby the previously negotiated transfer price can be adjusted without further negotiations should either cost or market price change. The recommendation is to change the transfer price in such a way as to maintain a constant "mark-up index" throughout the period.

There has been some concern expressed that the use of negotiations to determine transfer prices might be undesirable. For instance, Fantl (1974) notes that negotiations give "an advantage to the sharp trader rather than the efficient executive" (p. 43). Dopuch and Drake (1964) echo the same thought when they state that: ". . . management may be evaluating their ability to negotiate rather than their ability to control economic variables" (p. 13). Abdel-Khalik and Lusk (1974) suggest that: ". . . it would appear that a skill in collective bargaining may prove more useful than a skill in the

quantitative methods of pricing" (p. 23). Nevertheless, they state that according to a survey reported by the Financial Executives Research Foundation, 24 percent of participating diversified companies revealed that negotiations were the basis for the setting of transfer prices between divisions.

Depending on the negotiating orientation of the respective parties, such negotiations could be either functional or dysfunctional. If the orientation is toward joint problem solving, positive results could accrue in better interdepartmental relationships, as suggested by Dean. On the other hand, a competitive orientation could result in negative interdepartmental attitudes, unfavorable aftermath and increased potential for future conflict, in contradiction to Dean's opinion. This will be discussed in more detail in later sections.

Marginal Cost

Marginal cost is an appropriate basis for transfer pricing whenever there is excess capacity available. Many writers believe that some variation of marginal cost is the preferred approach whenever there is no readily available and meaningful market price, since this most closely parallels the company's interests (Hirshleifer, 1956, 1957; Henderson and Dearden, 1966). Marginal cost techniques avoid the problem of trying to get agreement on the allocation of overheads; it determines the underlying costs needed to decide whether it is in the company's interest

to buy on the outside, it does not overinflate inventory valuations (Cook, 1957).

Marginal cost is not without its own drawbacks. It could be considered as unfair to the supplying division in that all profits are passed on to the division that ultimately sells to the outside market. It reduces divisional autonomy, in that they are no longer able to control a major determinant of their performance measure. When the buying and selling divisions are highly dependent on one another, i.e., the output, costs and profits of one are affected by decisions made by the other; it is possible that a bilateral monopoly situation could result--a monopolistic supplier facing a monopsonistic buyer. The result could be a reduction in output with a decrease in overall company profits (Dittman, 1972; Gordon, 1964; Gould, 1964; Hirshleifer, 1956).

The simplest marginal cost calculations are those in which the commodity is produced in a completely competitive market. Transfer is at market price, which is equal to marginal cost.

Hirshleifer (1956) extended the marginal cost analysis to the cases where there is no external market or where the market is imperfectly competitive. He recommends a transfer price rule that is designed so as to correspond to the solution that a centralized management would arrive at with full information; namely, to set the sum of the divisional marginal costs equal to price, in a perfectly

competitive final market, or to marginal revenue in an imperfectly competitive final market. The procedure requires the producing and buying divisions to exchange some information.

Hirshleifer then analyzed the situation in which the two divisions are "free" to independently determine their own levels of output (thereby dropping the assumption of joint output). He determined that the transfer price should always be at market price, if the intermediate product is in a competitive market, independent of whether or not the final product is in a competitive or an imperfectly competitive market. In this case, the transfer price is equal to the marginal cost of the supplying division (competitive market for the intermediate product).

There is an incentive for the supplying division to charge its sister division more than its marginal cost, thereby increasing its own profit, but decreasing overall company profits; thus the possible need for a central planning unit, thereby reducing the autonomy of the supplying division.

Hirshleifer (1957) extended the analysis still further to consider the case of an internal supplier providing intermediate products to two or more divisions. If the demands of the two divisions are interrelated, the marginal revenues are adjusted through a series of internal taxes, in the case of competitive demands, and internal

bounties, in the case of complementary demands.¹ This takes into account the effect of one division's operations on the other. The adjusted marginal revenues are equated to the adjusted marginal costs to determine outputs.² These procedures are based on the assumption that the costs of production of each of the divisions are independent of one another, except as they are affected by level of output. In this case, demand dependence is allowed, but technological dependence is not.

To arrive at an optimum output and transfer price, a trial and error procedure is used, in which it is necessary, again, to exchange information between divisions and possibly a central planning unit. First, the divisions estimate their adjusted marginal revenue curves, their unadjusted marginal cost curves and their net marginal revenues, which are the revenues minus costs. The supplying division (or the central planner) sets a trial transfer price, equal to its own marginal cost, at some assumed total output. The respective divisions adjust their costs by the transfer prices and equate them to net marginal revenues, which will determine their own optimum output. Normally, the sum of the outputs of the two divisions will not equal the assumed output of the

¹Competitive demands are those in which an increase in the demand for one product causes a reduction in the demand for the other. In complementary demand, an increase in demand for one product results in an increase in demand for the other.

²This adjustment is needed to account for the changes in costs of commonly shared facilities which will vary with output of the two divisions.

supplying division. This output, and therefore the transfer price is modified, as often as needed, in order to "clear the market", such that the supplying division's output is equal to the total of the respective optimum outputs of the buying division. The transfer price is set at the marginal cost of the supplying division at the appropriate output, thereby optimizing its operation.

Gould (1964) elaborated on this model still further by analyzing the situation where the independent buying and supplying divisions see different outside prices, possibly as a result of location or freight differentials. He showed that the correct transfer price depends on relative price levels - the price at which buying division can buy on the outside market, and the price that would result from the intersection of the marginal cost and revenue curves of the selling division. He also noted that without central management controls, there would be an incentive for the supplying division to charge the buying division more than the overall optimum, thereby increasing its own profits, but decreasing total company profits due to reduced output and profits of the buying division.

It should be noted again, that in all of these marginal cost procedures, the divisions have lost a measure of their autonomy, as output levels and prices are set for them, in order to maximize total company profits, rather than the profits of any particular division. There are considerable data which must be collected and

exchanged between the division and the central planning unit. Further, it may be in the interest of the sub-units to try to supply faulty data to the other unit or to the central planner in order to increase its own divisional profit at the expense of the other division and the company as a whole. Whether they do this, depends on some of the behavioral factors to be discussed later. All of the aforementioned authors acknowledge this possibility, but give no solution to the problem, other than to note that management must be alert to it, and to possibly set up an auditing procedure to monitor the transfer of information.

Modified Variable Costs

Cook (1955) has suggested a procedure in which transfers are at variable cost, with the supplying division credited with a portion of the selling division's profits. Performance measures would be based on these profits, plus cost performance. The profit distribution would presumably be handled by negotiations.

Full Cost Plus

This is the standard accounting cost to which an "add-on" is appended. The "add-on" could be a fixed percentage, a lump sum, or a specified return on investment. It is an arbitrary and authoritarian procedure which, besides being a poor basis for evaluation of divisional performance, could divert production and investment into uneconomic channels. Furthermore, fixed

costs are accumulated in inventories, divisions operating at capacity are penalized because they have to allocate products for internal use; possibly at reduced corporate profits; managers have little incentive to control or reduce costs where recovery is assured (Dittman, 1972).

Opportunity Costs

Onsi (1970) and Holstrum and Sauls (1973) have recommended the use of opportunity costs. Holstrum and Sauls state that the firm will benefit from transfer only if the opportunity cost of the buying division is greater than the opportunity cost of the selling division. Therefore, the transfer price should be set at the intersection of the "marginal" opportunity costs of the two divisions. They further suggest that if the divisions do not follow this procedure, a portion of the contribution should be transferred from the division benefitting, to the one hurt.

Programming Procedures

Several procedures have been developed which take advantage of the dual property of the linear programming model. In this model, the optimal solution of the dual problem are shadow prices, the imputed value to the company, of increases in its investment in its scarce resources (reducing constraints). (Baumol and Fabian, 1964; Hass, 1968; Whinston, 1964). All of these

techniques use the decomposition principle developed by Dantzig (1963) which requires an iterative procedure whereby information is fed back and forth between a central planning group and the respective operating divisions.

The general decomposition procedure can be described as follows: managers of each sub-unit are requested by the central planning unit to choose an optimum level of activity for their unit, based on fixed resource prices provided to them by the planning unit, direct unit revenues and costs, divisional constraints and the technology relevant to the unit, i.e., the input requirements of fixed resources needed for different levels of the activity. The central planning group receives the various "optimal" levels of resources from the divisions and "clears the market", raising the price of a resource if it is in excess demand, and lowering the price if it is in excess supply, at the same time, satisfying higher level constraints. These prices are then fed back to the operating divisions who revise their "optimal" resource levels of activity. This iterative procedure continues until all constraints are satisfied. The solution is optimal in that no better solution exists in terms of the given organizational goals.

A central planner is needed because the divisions are asked to behave in a manner inconsistent with their own motivations and perceived best interests. However, even with a central planner, the problem of goal incongruence

does not disappear. "There exists a definite opportunity for 'gaming' the system, for divisional decision makers to deliberately falsify their output vectors in hopes of gaining control over more scarce resources and consequently, increase their own profits at the expense of overall profitability". (Hass, 1968)

As in the Hirshleifer procedure, the operating managers are guided (via subsidies) to increase by just the right amount those activities which yield external economies, and to decrease (via penalties) those activities which produce external diseconomies. (Baumol and Fabian, 1964)

A further level of sophistication has been added by Hass (1968) who developed a decomposition algorithm for quadratic programming that can handle the situation where externalities (interdependencies) exist and prices themselves are inadequate to guide decision makers to optimal solutions. The procedure is similar to Whinston's (1964), except that coordination is achieved via a stepwise modification of demand functions, rather than prices.

Krouse (1972) has developed a model that has:

"upper level management establish variable targets and direct operations level units to perform accordingly. In turn, the operations units, by their activity, determine efficiency prices for relaxing these targets. These efficiency prices are subsequently directed back to the policy level. In contrast to the more frequently used transfer-pricing technique of decentralization, where prices are channeled down as a mode of corporate control, the present model, conversely, has resource variable targets as being

directed down to the operations unit, and prices for relaxing the targets as being fed back." (p. 547)

In the decomposition approach to transfer pricing, the operating divisions have again lost a considerable degree of autonomy. A central planner tells them how much to produce and at what prices to sell and buy. Autonomy is limited to those activities that do not involve interdepartmental transfers and to cost control. These planning procedures are quite similar to those used in socialist societies (Gordon, 1964).

The linear and quadratic programming procedures are similar to the marginal cost approaches in that they too use direct costs. However, the programming procedures can handle a multiplicity of products and constraints as well as more complex externalities.

It should be noted that several writers believe there is no one best way of arriving at suitable transfer prices (Abdul-Khalik and Lusk, 1974; Cock, 1957; Dearden, 1960; Dittman, 1972; Menge, 1961). Troxel (1973) sums it up by stating that "no one method of transfer pricing can effectively satisfy all of the information needs of a decentralized organization" (p. 896). What is best, depends, therefore, on the particular purpose.

Dascher (1972) has indicated how managers of a hypothetical, decentralized manufacturing company might differ in their perceptions of the criteria for the choice of a transfer price procedure. The internal auditor wanted one that emphasized objectivity - information derived

should be unbiased and verifiable. The industrial engineering manager stressed the importance of divisional autonomy. The industrial psychologist viewed transfer prices as a motivational tool, used to direct managerial activity towards corporate goal fulfillment. Personnel considered transfer pricing to be a communications vehicle, to increase divisional management's awareness of the company's profit objectives. Operating division managers wanted a system such that their performance measures would not be dependent on performance efficiency or on decisions made elsewhere in the company. The controller was primarily concerned with the ability of transfer prices to facilitate the preparation of clear, concise, timely reports to measure performance. In view of these potentially disparate perceptions, it is no wonder that no one system for the determination of transfer prices has evolved.

At the extreme, Wells (1968) declares that "there is no situation, in the circumstances described, in which any form of transfer price is meaningful or useful" (p. 174). He states further that ". . . transfer prices which are not prices, and profit centers which do not earn a profit, are mythical inventions. They are fictions which cannot serve as a basis for action" (p. 180). He agrees with Goetz (1967) and Henderson and Dearden (1966) who propose budgetary control, rather than profit control, since the former is congruent with the concept of divisional autonomy and self-control.

Finally, it can be seen that although most of the aforementioned transfer price mechanisms appear to be objective, they nevertheless do contain some degree of subjectivity and potential for conflict, cheating and suboptimization.

Transfer Pricing as a Behavioral Problem

Only recently has a literature developed which considers transfer pricing from a behavioral perspective. Watson and Baumler (1975), drawing on the work of Lawrence and Lorsch (1967) and Thompson (1967), view transfer pricing as an integrative device. They believe that linear programming derived prices or those based on straight-forward accounting cost, could be suitable for behaviorally simple integrative problems--those characterized by stable environments and pooled interdependencies.¹ For more complex situations, transfer pricing can be considered as an aspect of a multi-dimensional conflict resolution process. Where negotiation² would be an appropriate resolution process, transfer pricing, arrived at via negotiation, would likewise be relevant.

Larson (1970) also considered some of the behavioral aspects of transfer pricing, coming to the conclusion that

¹Thompson (1967) defines pooled interdependencies as those situations in which each part of the organization renders a discrete contribution to the whole and where the parts do not interact directly with one another.

²Watson and Baumler use the term, negotiation, in the same sense as joint problem solving is used by Blake, Shepard, and Mouton (1964) and confrontation is used by Lawrence and Lorsch (1967).

it was undermining the underlying concept of profit centers, due to the conflict between the concept and the obvious loss of divisional autonomy resulting from administered pricing. He comes to the conclusion that no transfer pricing method is likely to be successful unless the problem of profit center management is first solved. However, he made no recommendations on what should be done to solve the profit center problem, nor did he do any research on the behavioral effects of transfer pricing.

Walker's (1970) experimental study of conflict in marketing channels showed that the relative power of the channel members determined their division of profits. Such division of profits is achieved via negotiations that ultimately determine the price at which goods are transferred from one channel member to another. This system seems to be very similar to that of intracompany transfers between "autonomous" profit centers. Of particular interest to the proposed research is Walker's finding that protracted negotiations and attempts to increase relative power caused a decrease in channel efficiency and a reduction in the probability of functional cooperation between channel members, due in part to the unfavorable attitudes developed in the course of these negotiations.

It is the intent of the proposed research to explore the potentially dysfunctional aftermath of the transfer pricing process, a topic receiving scant attention in the literature.

The basic premise is that transfer pricing should be viewed as a process of conflict resolution. Therefore, the conflict literature should be relevant in guiding research concerning the behavioral consequences of transfer pricing mechanisms. Several conflict models have been proposed. These will now be considered in relation to the nature of the conflict surrounding transfer pricing, how such conflict may be resolved and the aftermath that can be expected following conflict resolution.

Conflict Models

a. Pondy Model

Pondy (1966, 1967) considers three classes of conflict phenomena:

- 1 - Bargaining model - conflict among interest groups in competition for scarce resources
- 2 - Bureaucratic model - superior-subordinate conflicts along the vertical dimensions of the hierarchy
- 3 - Systems model - lateral conflict relative to coordination and interdependence

It is suggested that the conflict surrounding transfer price includes some aspects of both bargaining and systems. Transfer prices will affect the profits of the respective divisions which will affect the power, prestige and legitimacy of their demands for larger shares of scarce resources. Since the divisions will continue to maintain a supplier-customer relationship after the transfer price is set, interdependence is a fact.

Pondy notes that all three models have common

characteristics:

- 1 - Conflict is made up of sequential episodes
- 2 - Conflict can be functional or dysfunctional¹
- 3 - Conflict is tied up with the ability of the organization via feedback mechanisms

The Pondy model can be represented by the flow chart shown as Figure 1.

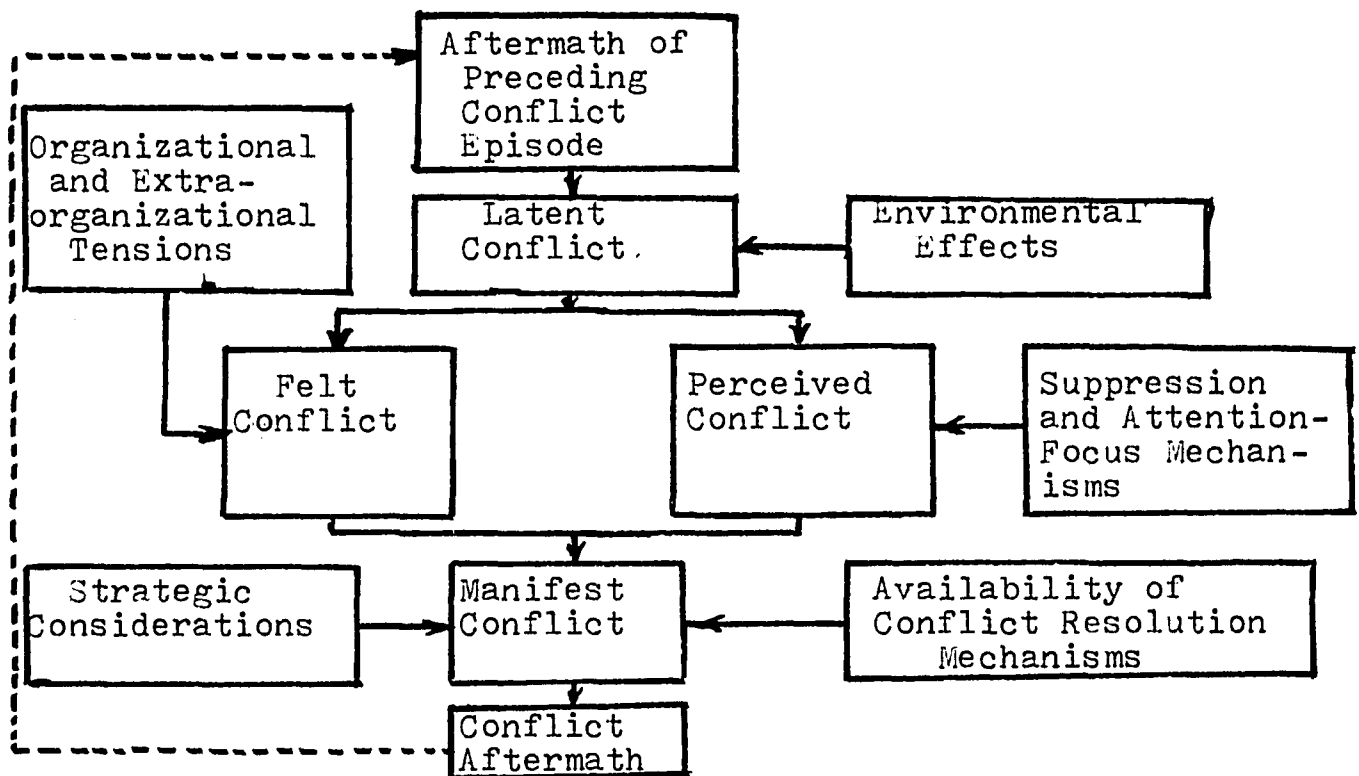


Figure 1 - Dynamics of a Conflict Episode - Pondy

The relevance of the variables to transfer pricing will now be discussed.

Latent Conflict - This is related to organization conditions such as competition for scarce resources, drives for autonomy, divergence of sub-unit goals. All

¹Coser (1956) describes in more detail the conditions under which conflict can be functional.

three of these conditions have already been shown to be relevant to transfer pricing.

Perceived Conflict - This is related to the suppression and attention-focus that limit the perception of conflict, as well as misunderstandings of the true position of the other departments. The former are present when the managers are faced with more conflict than can be dealt with, and therefore pay attention only to those which are short lived or routine. Those that are less programmable are often delegated to others. If the manager does not feel that the transfer price is particularly important or threatening to him, perceived conflict is diminished. Perhaps the transfer price would account for only a small variance in his total divisional profit, since most of his sales might be from or to outside sources.

Felt Conflict - This is a personalization of conflict (tension model), depending on the personalities involved and the congruence of individual and organization goals.

Manifest Conflict - This refers to the form of behavior of the respective parties. Whether conflict becomes manifest, and the form it takes, depends on organization structures and procedures as well as the expectations and motives of the parties. Some of the transfer price mechanisms can be expected to suppress conflict behavior while others could induce it. For instance, where market prices are used, and they are perceived as relevant by both divisions, little conflict

would be expected. On the other hand, negotiated prices and prices set by a planning unit could both be conflictful.

Conflict Aftermath - If each conflict episode is but one of a sequence of episodes that constitute the relationships between parties, its importance to transfer pricing is pervasive. The determination of transfer price is but one step in a long term relationship, which will, in turn, determine whether the two interdependent units will cooperate with each other (in scheduling, controlling, developing new products, and planning joint activities) or whether they will antagonize and mutually frustrate each other.

b. Walton and Dutton Model

Walton and Dutton (1969) identify five variables in representing a model of conflict in lateral relationships, as shown in Figure 2.

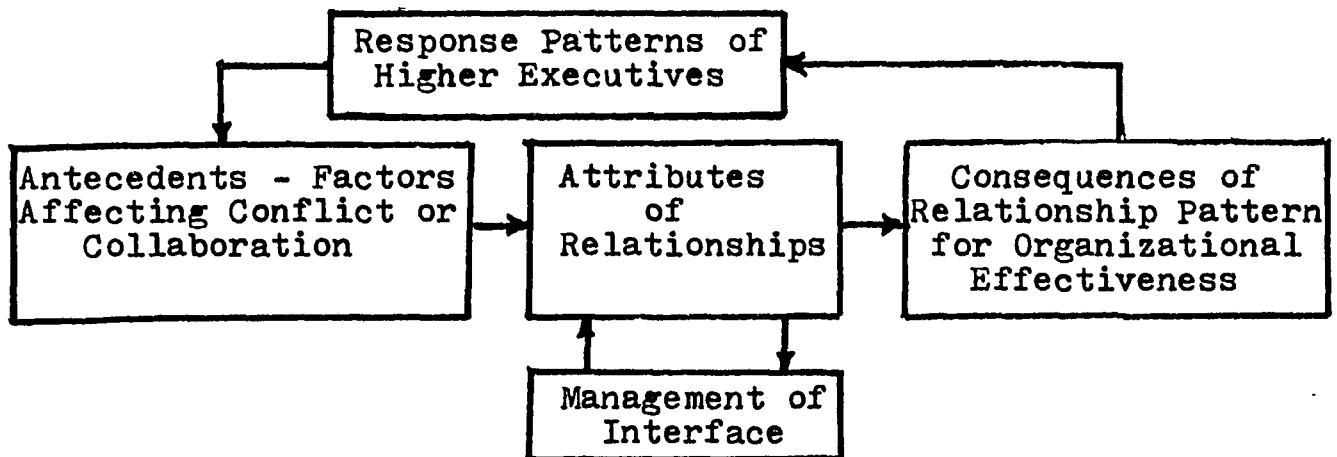


Figure 2 - Model of Interunit Conflict - Walton and Dutton

The antecedent conditions that could affect conflict or collaboration include mutual dependence, task related assymetries, performance criteria and rewards that emphasize separateness, organization differentiation, role dissatisfaction, ambiguities, dependence on scarce resources, communication obstacles, personal traits. All of these are of concern in the transfer price situation and are, in many ways, similar to Pondy's latent conditions.

Authority, power and influence factors, and the nature of past experiences in interdepartmental conflict resolution are part of what Walton and Dutton consider interdepartmental relationships.

Management of interface relates to the approaches used to resolve conflict. Is the approach integrative or competitive? Is the attention devoted to interface management appropriate to the degree of differentiation in the organization (Lawrence and Lorsch, 1967)?

Whether the conflict is functional or dysfunctional is determined by the consequences of interunit conflict (Pondy's aftermath). Higher executives will respond to the conflict depending on their own habitual patterns, emotional reactions, emphasis on short term or long term performance, allocation of rewards, recruitment policy, depersonalization of the conflict via procedures and programs, all of which are fed back and are antecedents to the next episode.

Some of the model has been validated. Walton, Dutton

and Cafferty (1966) showed that conflict does result from factors that originate outside of the personal relationship, such as suboptimizing incentives, ambiguity in departmental jurisdiction and communication obstacles.

Walton, Dutton and Fitch (1966) found that more competitive decision making processes (as opposed to joint problem solving) are accompanied by more formal decision rules and unfavorable attitudes. Although the authors discussed the possibility of feedback of such attitudes, they provided no such evidence.

c. Schmidt and Kochan Model

The Schmidt and Kochan (1972) conflict model is shown in Figure 3. They suggest that two conditions are necessary for overt conflict behavior:

- (a) goal incompatibility provides the motivation for interdependent parties to engage in conflict, but,
- (b) for overt behavior to occur among parties with incompatible goals, they must have the ability to interfere with the goal attainment of the other parties (Kochan, et al, 1975, p. 11)

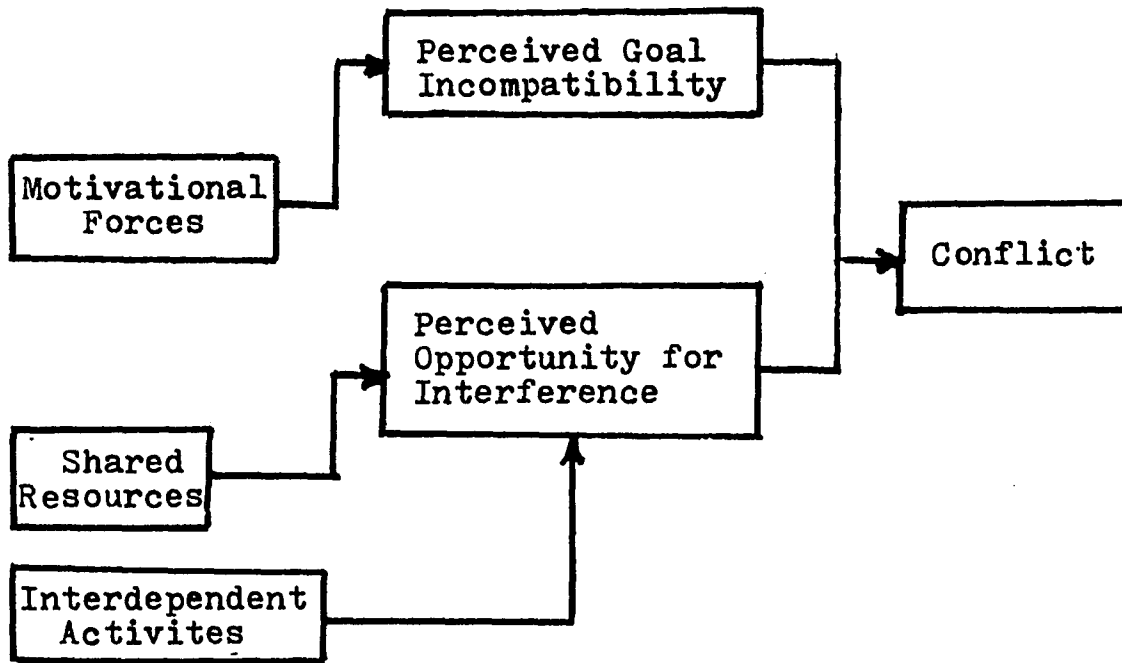


Figure 3 - Conflict Process - Schmidt and Kochan

Schmidt and Kochan's concept of conflict is similar to Pondy's in that it is dynamic in nature. However, it differs in other respects. Whereas Pondy is concerned with both latent and manifest conflict and considers divergent goals as only one of several possible antecedents, Schmidt and Kochan define conflict in terms of overt behavior, specifying incompatible goals and deliberate blocking actions as requirements for conflict. The deliberate blocking can occur at the resource sharing stage or at the stage of interdependence of activities, or both. The strategies for resolving conflict depend on where the blocking action occurs.

A recent test of the model (Kochan, et al, 1975) confirmed the causal effect on conflict of both goal incongruence and the ability to interfere. However, their hypothesis that both were necessary for conflict was not

supported.

The three models are quite similar to one another. They all emphasize the aftermath of conflict and state that resource sharing, interdependency and goal divergence or incompatibility promote conflict. They are highly relevant to transfer pricing.

If transfer pricing is viewed as a conflict problem, and if the episodic and feedback nature of the aforementioned models are accepted, then the methods used to resolve transfer pricing conflicts should be of concern to management, since this could have an effect on the attitudes and behaviors of the respective parties during subsequent interactions. These interactions could be concerned with the need for continuing cooperative efforts in such areas as production scheduling, agreement on product specifications, research planning, interchange of relevant technical information and any other logistical problem affecting the quality, availability or physical transfer of goods from the supplying to the buying division. How these problems are handled could obviously affect the combined efficiencies of the two divisions.

Modes of Conflict Resolution

Blake, Shepard and Mouton (1964) listed nine ways in which conflict can be resolved, depending on how the parties to the conflict perceive the situation.¹

¹Seiler (1963) and Robbins (1974) classify conflict resolution into eight modes that are quite similar to those of Blake, et al.

If they believe that disagreement is inevitable and permanent, they may resolve their conflict in the following ways:

- a) Win-lose struggle (forcing)
- b) Resolution by a third party
- c) Resolution by fate

If they believe that the conflict can be avoided, and their interdependence can be reduced, the relevant resolution modes are:

- a) One group withdraws
- b) Maintaining indifference
- c) Isolation of the parties to the conflict

If the parties want to maintain their interdependence and believe that agreement is possible, they could:

- a) Smooth over (peaceful coexistence)
- b) Compromise (bargaining)
- c) Problem solve

Blake et al opt for problem solving, which they view as an optimistic approach, one that is functional, but which requires a positive mentality, which can be developed through training. The conflict resolution process is possibly the most important aspect of conflict theory as it applies to transfer pricing, since this process can have significant effect on future events and degree of cooperation. Several of the possible modes of conflict resolution will be discussed in more detail to determine how each might relate to transfer pricing.

a. Win-lose situation (Zero-sum game, Forcing)

This is the orientation that would presumably be the one which many departmental managers engaged in transfer price discussions would probably consider their situation. As a win-lose power struggle, any change in the transfer price obviously has opposite effects on the profits of the departments. If 1,000,000 pounds is transferred from department A to department B and the transfer price increases by one cent per pound, the profit of department A increases \$10,000, while that of department B decreases by \$10,000. It will be seen that this is an especially inappropriate orientation for transfer price conflict resolution, because of its potentially dysfunctional aftermath.

Win-lose struggles are characterized by:

- no compromise since the results are mutually exclusive
- there is often a closing of ranks within each of the groups which increase their internal cohesion
- negative stereotypes of the other side are formed
- commonalities tend to be overlooked, differences highlighted
- distorted judgments of competing positions - own is perceived to be superior
- attitudes and opinions are polarized

The aftermath of win-lose is evident. Mutual feelings and attitudes are often so negative that further cooperation and communication is difficult to achieve. Considering that the two departments are presumably still

dependent on one another, the lack of positive feelings and the antagonism that results, will produce dysfunctional consequences. Win-lose confrontation should be avoided in transfer pricing.

In a win-lose struggle, "Forcing" occurs when one party tries to use pressure tactics to force the other party to give in. This might involve the use of threats, punishment and positional commitments. (Wexley and Yukl, 1977)

In the context of transfer pricing, forcing will be dependent on the relative power of the two parties. Schelling (1960) has also argued that if one of the parties is able to convince the other party that he has a commitment to a certain position and cannot concede any further, the other party might be forced to accept it, since the alternative (no agreement at all) is even less acceptable.

Forcing is not viewed as a desirable mode of conflict resolution. It could cause resentment in the weaker party, and they are likely to respond in a dysfunctional manner. This can take the form of disruptive behavior, avoidance of future contacts wherever possible, or efforts to "get even" the next time.

b. Third Party Intervention

Should the parties to the conflict be unable to resolve the conflict, or for some reason be unwilling to negotiate with each other, a third party might be called

in. In the case of transfer pricing, this third party could be the common superior of the two divisions or an individual assigned to this task by the management of the company.

When this takes place, there might very well be neither a winner nor a loser. Even if one of the parties does "win", the loser will have little commitment to future cooperation. If their mutual superior is the third party involved, an undesirable situation could be created, especially when unity of effort is needed in future relationships. Of course, the manager might believe that such competition is useful, but the subordinates will view their differences as inevitable and not actively work toward identifying mutual objectives.

The losers will likely look at their superior as an unfair judge, attributing their defeat, not to the weakness of their case, but to the incompetence of their boss, further weakening their relationship and withdrawing their support. The superior loses the confidence of his subordinates and his power base could suffer (Zaleznick, 1970). It is expected that many transfer pricing situations are resolved by third party intervention, although not necessarily by a common superior.

c. Resolution by Fate

This mode of conflict resolution would have little application in transfer pricing, since the two parties cannot procrastinate indefinitely, hoping that the problem

will disappear and thereby avoid the necessity of making a decision. Time limits prevent this.¹

d. Withdrawal, Isolation, Indifference

All of these modes imply that disagreement is not seen as inevitable, but neither is agreement seen as possible (Blake, et al, p. 64). One or both of the parties fail to see the importance or necessity for interdependence and move to reduce it. Assuming that interdependence is an integral part of the transfer price mechanism, these modes would not be applicable to the resolution of transfer price conflict.²

e. Peaceful Coexistence (Smoothing)

This is a passive reaction to conflict, wherein the parties maintain a social relationship, playing down their differences, isolating goals that conflict. The implied rule between groups in a state of peaceful existence is that issues that would divide them are not debatable. Divergent points of view which might generate a win-lose struggle are not discussed. Smoothing by itself does not seem very appropriate in transfer pricing, since pricing is an issue that is inherently conflictful and must be debated.

¹However, if one of the units perceives price as unimportant to its performance, it could randomly select a transfer price.

²However, if one of the units perceives price as unimportant to its performance, it could act indifferently.

f. Bargaining (Compromising)

In this mode, the parties believe that agreement is possible and will be reached by negotiation and mutual concessions. It is a joint decision act that involves only sharing of one unit's preferred solution or some overstatement of it (Walton, 1966). It is a pessimistic philosophy, viewed as an acceptable alternative to win-lose, where the search is not for the best solution, but for one which is "right" (Blake, et al, 1964). The relationship is strongly competitive. Transfer prices are probably often determined in this mode and it will therefore be discussed in more detail. "We should find that transfer payment rules result primarily from a long-run bargaining process rather than a problem solving solution." (Cyert and March, 1963, p. 276)

When two units enter into a bargaining mode, certain behavior patterns are often followed:

- Information exchanges are done in such a manner that each party tries to give as little as possible to the other, while trying to get as much as possible in return
- Few interactions are provided
- Information is channeled through few people in order to control and possibly bias the information transmitted
- Own positions are defended, rather than objectively considered relative to those of the other side. (Maier, 1967) In questioning the opposition, the intent is to weaken their position rather than gain information. As a result, shared areas go unrecognized, areas of true agreement go undiscovered (Blake and Mouton, 1961)

- Formal decision rules and procedures are adopted; structures become rigid, circumscribed (Walton, 1966)
- Goals of the parties remain fixed (March and Simon, 1958)
- The more competitive the bargaining environment or orientation, the more likely the orientation towards win-lose confrontation
- Hindering activities are prevalent

Game experimentation has been conducted to determine how opponents will behave in a mixed-motive situation¹ as contrasted to a win-lose situation. Druckman (1971) and Gallo and McClintock (1965) have summarized a good deal of this work. Some of the findings derived from game experimentation might be applicable to transfer price bargaining, but there are real limitations in extrapolating such findings to real-life situations because of lack of motivation on the part of the players. The more real-life the "game" becomes, the more uncontrolled it becomes and the more difficult it is to draw meaningful conclusions (Rapaport, 1966). Nevertheless, some of the findings should be useful in exploring behavior of transfer price negotiators:

- Cooperative responses tend to elicit cooperative responses. The parties tend to become more like each other (Rapaport, 1966)

¹This is the situation prevalent in the prisoner's dilemma game, where each participant can gain by cooperating with his opponent, but this requires trust, since there is an incentive for each party to cheat, and there are penalties involved. Prisoner's dilemma seems to be an appropriate model for some of the transfer price mechanisms, including the quantitative techniques previously discussed.

- Cooperation increases as the reward for cooperation increases (Rapaport, 1966)
- Cooperation increases as the penalty for defection increases (Rapaport, 1966)
- Conflicting results are reported on the effect of deadlines and time pressures on the level of conflict (Druckman, 1971)
- The greater the range of possible outcomes, the greater the conflict (Druckman, 1971)
- Conflict is greater when representing an assigned position than own position (Druckman, 1971)
- The parties tend to overevaluate their own position and tend to distort their perception of others (Rapaport, 1966)

The bargaining mode of conflict resolution, since it is often manifested in restricted interaction, concealment and distortion, issue centered orientation and limited meaningful communication, could lead to negative attitudes during and after bargaining. This is likely to be dysfunctional in transfer pricing, as the groups try to frustrate the other's goal achieving activity. Walton, Dutton and Fitch (1966) point out that such a sequence is self-reinforcing and can become institutionalized: perception of divisive goals lead to a bargaining orientation, which leads to concealment, distortion and threat, which leads to circumscribed interaction patterns, which reinforce the initial perception of divisive goals.

For these reasons, bargaining is not expected to be the optimal mode for the resolution of the transfer price conflict, although it is probably a commonly used approach.

g. Problem solving

This mode is characterized by a full sharing of all the mental processes of the participants in order to arrive at a final decision. It is an integrative process (Walton and McKersie, 1966). It is the preferred approach to conflict resolution (Blake, Shepard and Mouton, 1964; Lawrence and Lorsch, 1967; Maier, 1967; Ryan and Clemence, 1973; Sherif et al, 1961; Walton, 1966). Problem solving is a sequential, ordered approach to decision making (March and Simon, 1958). It can be characterized as follows:

- High level of interaction and communication
- Infrequent appeals to higher authorities
- A more positive, accepting (less stereotyped) attitude develops toward the other party, who is no longer perceived as an opponent
- There is greater familiarity with other's operations and problems which promote collaboration and trust
- The parties try to explore alternatives and identify the root causes of the conflict, in an attempt to prevent positions from becoming polarized. There is often acceptance of superordinate goals which have meaning as a common guide for behavior.

Problem solving is a preferred mode of conflict resolution, especially when the units must retain close interdependency, and be able to work together after problem resolution, as in transfer pricing.

Certain conditions are conducive to the development of a problem solving orientation:

- A general feeling of trust and openness in the organization, particularly in the relevant inter-

departmental relationships (Blake et al, 1964)

- Less emphasis on potentially divisive sub-unit goals used for sub-unit performance evaluations (Ackoff, 1966)
- Identification with a superordinate goal (Sherif, et al, 1961)
- Reduction in peripheral contextual factors that could promote conflictful situations: frustrating task conditions, work overloads, structural assymetries, ambiguity in departmental jurisdiction, communication obstacles (Walton and Dutton, 1969)
- Increase in the familiarity of each department with the operations of the other. Limited cognitive skills breed conflict (Walton, Dutton and Fitch, 1966)

h. Persuasion

Wexley and Yukl (1977) identify persuasion as a method of resolving conflict. In this approach one of the parties tries to convince the other to change position and accept his position. He could do this by one of the following (p. 179):

- Provide factual evidence that supports his decision
- Discredit information supporting the opponent's position and point out errors in his logic
- Point out possible costs and disadvantages of the other party's proposals that may have been overlooked
- Point out how his proposals could benefit the other party.
- Show how his proposals were consistent with prior precedent or norms

This approach could have application in transfer pricing especially if the two parties agreed on their goal but were in disagreement as to how they might best meet that goal. As Wexley and Yukl point out, such persuasion

should not threaten the ego or status of the other party.

There seems to be no literature on the consequences or aftermath of this mode of conflict resolution. It could be a dysfunctional approach if one of the parties believes he "lost" and internally attributes this result to unfair or dishonest tactics employed by the other party..

We have now discussed, in general terms, first, how transfer prices are determined, and second, how conflicts resulting from transfer price decision making may be resolved, noting that problem solving is the desired and preferred approach.

We will now try to integrate the two aspects into an overall model of and approach to transfer pricing, and to propose various hypotheses for experimental verification.

CHAPTER II

MODEL DEVELOPMENT AND RESEARCH HYPOTHESES

Little meaningful behavioral data are available relative to the transfer pricing techniques practiced in industry other than very general observations (Boyd, 1961; Menge, 1961; Sewell, 1966; Whinston, 1964). Other anecdotal references describe general philosophies (Dearden, 1964; Knighton, 1965). There appears to be little literature that specifically discusses transfer pricing from the viewpoint of conflict resolution, particularly, relative to its functional or dysfunctional aftermath.

Menge (1961) provided the most detail in his case study of the transfer pricing practices of a large, integrated automobile manufacturer. He noted that although the mode of operation was "transfer at competitive prices", and formalized procedures were provided for determination of specific transfer prices, the procedure that was actually followed, often produced artificial transfer prices. Negotiation was the accepted practice, but it was not unusual for as many as half of the internal transfer negotiations to end in dispute, with adjudication by a central pricing committee. It is unfortunate that Menge did not push further to determine the nature of the aftermath of these negotiations. Menge did point out that at times,

neither division was satisfied with the price, but neither was prepared to carry the dispute to higher authorities, i.e., top executive review--the chance of losing a great deal more than inter-divisional profits might be at stake should the latter course be taken.

By its nature, transfer pricing is likely to be conflictful, but as Coser (1956) points out, a conflict can be functional:

- it can initiate interactions
- it can foster intergroup cohesion
- it can remove antagonism between parties and integrate their relationships
- it can prevent complete cleavage of relationships
- it can be a vent for hostility and an expression of dissent

Transfer price conflict need not be eliminated--it should be resolved in such a way as to increase its functionality.

A contingency approach to transfer pricing has been suggested (Ackelsberg, 1973; Watson and Baumler, 1975). As Lawrence and Lorsch (1967) have pointed out, organizations require varying degrees of differentiation, in order to cope with varying degrees of uncertainty in its environment. Such a differentiation is conducive to conflict. Depending on the degree of differentiation and therefore, the degree of latent conflict, varying degrees of integration must be designed into the organization. It is suggested that transfer pricing could be viewed as a tool

for integration as well as a management control tool.

The organization that is bureaucratic could very well require a different transfer price mechanism than an organization that is not. The former, with its greater reliance on formal procedure and its more rigid structure, is more likely to be centralized, even if it has a "nominal" profit center structure. It is expected that the more bureaucratic the organization, the less the need for realistic and meaningful transfer prices. In these organizations, transfer prices might very well be assigned by a centralized planning group (if used at all), with divisional appraisal based on criteria other than profit, such as cost reduction, functional innovation, safety, administrative capability, labor relations, pollution control, etc. They should be held accountable for what they control.

Unlike most of the accounting literature, Watson and Baumler (1975) approached the transfer price problem from a behavioral perspective, drawing heavily on the concepts of Thompson (1967). They argue that the accountant should take cognizance of the requisite differentiation in an organization when they develop formal control and reporting systems. They also believe, as has already been suggested, that:

"to some extent, the transfer pricing mechanism enhances differentiation. But we have also demonstrated above that differentiation is only one part of the problem. Integration is another facet of this problem. Can the transfer pricing mechanism be used to help achieve the

required integration? Again, the answer is obviously 'yes'. In many cases the pricing mechanism is a routine or standardized process, a formula, like, for example, standard cost, cost plus, marginal cost, fixed cost, etc. This type of transfer pricing is at least applicable in simple integrating situations although in more complicated integrating situations it may be only one input to the integrating process. (Watson and Baumler, 1975, p. 469)

They further note that the mathematical programming and economic solutions might be relevant only to the behaviorally simple integration problems.

For behaviorally complex integration problems, Watson and Baumler recommend the use of a negotiations process, which is similar (in their terminology) to the problem solving approach to conflict resolution previously discussed. In this case, they view transfer pricing as "one facet of a multi-dimensional conflict resolution process. If the appropriate conflict resolution process is negotiation, then it appears the transfer price should be one arrived at through negotiation." (p. 472)

A model has been developed in an attempt to describe the role of transfer pricing within the context of contemporary organization theory. The model, which draws on the aforementioned conflict models, as well as on the work of Lawrence and Lorsch (1967) and Thompson (1967), is shown in Figure 4. It can be seen that some of it closely relates to Watson and Baumler's arguments, as described above.

A central assumption for the model is the profit center concept and the need for objective measures of divisional performance in order to administer an evaluation

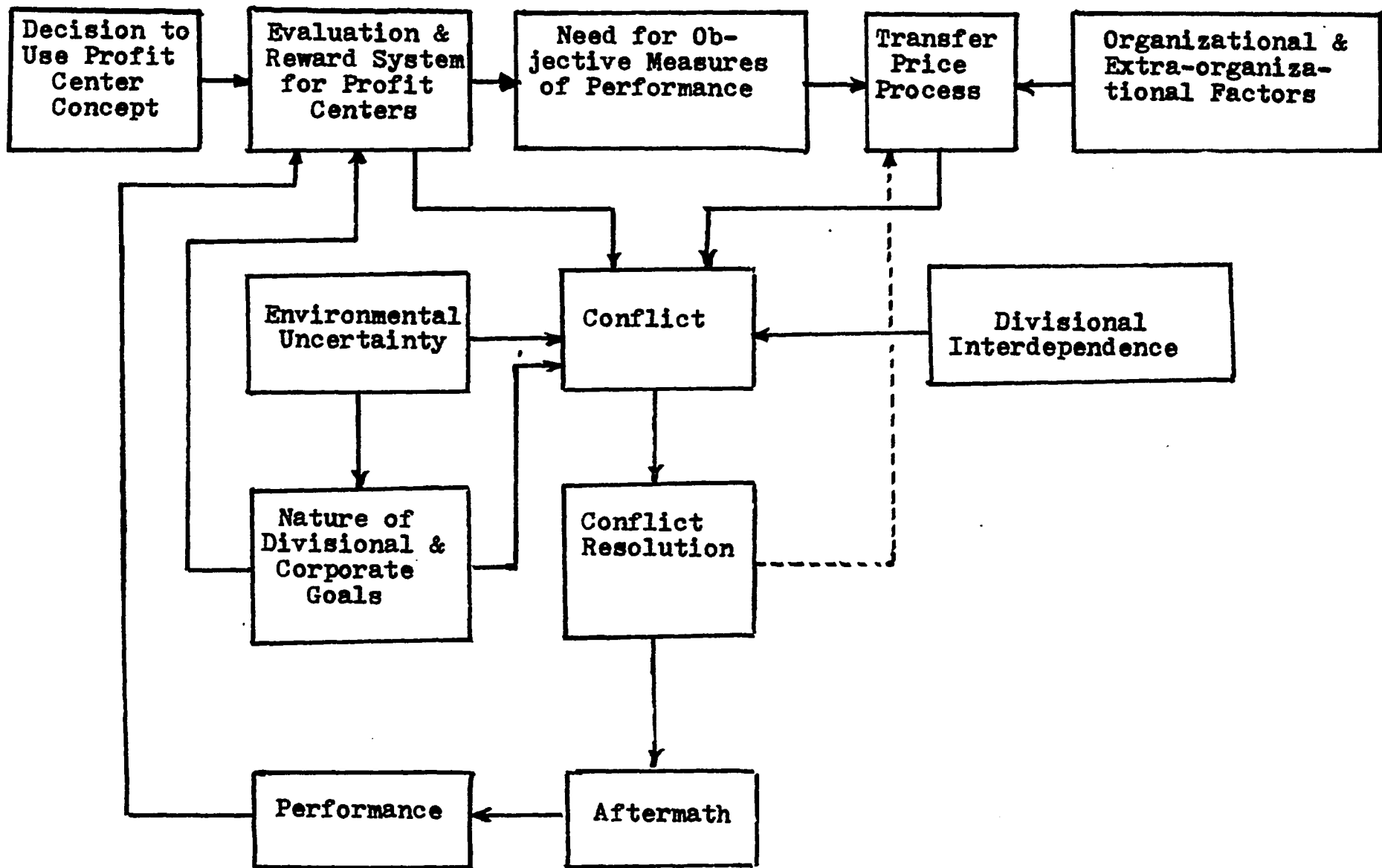


Figure 4 - Model of Transfer Price Process

and reward system. Such a need provides the incentive for the use of an appropriate transfer price system.

A number of organizational and extra-organizational factors will have an effect on the design of the transfer pricing process. The existence of an external market for the transferred product, the importance of the transferred product to the respective divisions and the structure of the organization can be instrumental in designing the process.

For instance, if there is a definite and legitimate market for the transferred product, and the product is not particularly important to the divisions, perhaps no formal procedures would be needed, since one could simply use the market price. On the other hand, if the product is important, the market price might be considered only as a guide, with the final price set through some process of interaction between the two divisions. A mechanistic organization might be more likely to use formal procedures and formulae for transfer price determination, whereas an organic organization could decide to let the divisions come up with their own procedures or to interact in some way.

Should the divisions face differing environmental uncertainties it would be expected that differentiation, including goal differentiation, would result. This, per Lawrence and Lorsch (1967), would be likely to promote conflict and establish the need for integration. When the divisions rely on each other for supply and demand of

products, interdependencies would be present and some type of integration mechanism would be needed in order for the organization to be effective (Galbraith, 1972). Per Schmidt and Kochan (1972), interdependence can be perceived as a condition that promotes conflict.

The conflict that results can be resolved by any of the various techniques previously discussed, with the aftermath of the process dependent on the mode used to resolve the conflict. A system that promotes a problem solving orientation would be expected to promote a functional aftermath that could result in positive post-decision relationships, leading to improved combined performance of the two divisions.

An appropriately designed evaluation and reward system, i.e., one that promotes joint problem solving by de-emphasizing the importance of divisional profit, could therefore enhance performance in those cases that involve intracompany pricing of transferred products.

For management appraisal, it is not important that all companies measure divisional performance or income in the same terms. What is important is that performance be appraised in terms that make sense in each individual case (Knighton, 1965). As discussed, many transfer price mechanisms do not make sense and do not meet this standard; their use in appraisal is therefore questionable.

As Salter (1973) points out, performance measures send out signals in terms of the norms of intergroup cooperation.

The latter is strengthened by setting the size of the bonus pool for divisional executives primarily on the basis of total profits rather than divisional profits. Where interdivisional transfers are to be encouraged and joint work by divisions is part of the company's normal operations, Salter suggests discretionary, rather than fixed formula bonus. The former can accent the less quantifiable aspects of the manager's job, whereas the latter can hinder the achievement of corporate goals, particularly at the long term level.

A potential problem that can arise from the use of non-profit goals is that intangible goals tend to be displaced, by more tangible and measurable goals, which might be unrelated to corporate objectives, being oriented to organization maintenance. Such goal displacement can be in the form of increases in "hard" data, ad hoc decision making, program planning and rules making. (Warner and Havens, 1968).

A further potential problem is pointed out by Pitts (1973), who notes that a divisional executive's bonus should be related to the autonomy of the division. In those circumstances where autonomy is low¹, there is need for

¹For instance, in a situation where the transferred product is extremely important to the profits of the division, but the price of the product is determined by formula, third parties, or via a linear programming technique.

financial incentives based on more than merely divisional profit, since accounting profitability figures tell very little about true executive achievement and are difficult to interpret. Such firms try to employ specific measures that indicate the contribution of the division to the overall health of the corporation, both long term and short term. However, subjective measures tend to undermine the validity of an incentive system.

Dearden (1968) recommends that profitability budgets, based on transfer prices should be used only for planning purposes, not as an objective against which actual performance is to be measured, since they are misleading. Further, managers tend to become overly motivated to short term actions that could have long term, deleterious effects. The emphasis on short term profit derived from illusory transfer prices obscures the fact that realistic evaluations are not being made.

Vancil (1973) stresses the relationship between a control system and corporate strategy. He notes that there are two types of financial responsibility that can be used for control purposes--cost center or profit center, depending on what the management believes to be relevant to the achievement of their long term objectives, as manifested in their strategy. He suggests "double counting" profits and holding each division responsible for a portion of the profits (using transfer prices).

What is apparent is that there is dissatisfaction

with many arbitrary and non-realistic control and appraisal systems. Transfer prices are an integral part of these systems, and contribute to the dissatisfaction.

There would seem to be little to be gained, in fact it could entail an opportunity loss, by having the divisions go through the transfer price ritual, with its potentially heavy reliance on aggressive bargaining, with the strong possibility of a dysfunctional aftermath. These decentralized divisions can best exert their efforts and energies to achieve goals which have an impact on superordinate corporate goals. Allocation of resources could be accomplished on an overall profitability basis, looking at the interdependent divisions as one. Specific divisional allocations could be based on the achievement of specific division-oriented goals. In other words, for the minimally differentiated firm, the orientation of divisional goals and performance should be toward costs rather than profits, reducing the dependence on transfer price.

This does not undermine the concept of decentralization. It is still valid, since divisions are still in control of their operations; in this situation transfer prices, to them, are not relevant for performance appraisal, management development, efficient decision making, and other advantages derived from decentralization.

In an environment that is changing, where high levels of differentiation are required, more sophisticated integ-

ration mechanisms are needed. Here, an entrepreneurial management orientation should logically place more emphasis on profitability and therefore on transfer price. Integrating devices used by the firms in other areas, could be used in the transfer price determination. We would expect that there would be more flexibility in inter-departmental relations and procedures and therefore more flexibility in transfer price mechanisms. The approach should be one of joint problem solving, with the sub-units not limiting themselves to any particular procedure. Identification with superordinate goals would seem to be vital.

The appropriate transfer price determinations will be affected by the assymetries present in specific situations. There is no reason to expect that the transfer price -- utility function would be the same for all parties--the product could be much more important to one part of the operation than to another. One department could be older, more stable, larger, have greater status or prestige, more power.¹ The cost or capital structures or time orientation could differ. Since there is no way to decide on an appropriate mode of integration without analyzing the environment of the organization, it would seem reasonable

¹Hickson, Henings, Lee, Schneck and Pennings (1971) have proposed a contingency theory of power, in which sub-unit power is related to its ability to cope with uncertainty, the substitutability of its activities, control of its contingencies, immediacy and pervasiveness of its workloads.

to hypothesize that transfer price, as an integrating device, likewise cannot be preselected.

It would therefore seem that transfer pricing would be a fertile area for research, under the umbrella of further contingency theory validation. The current status of transfer pricing is that it is viewed from the standpoint of economics and operations research, minimizing the fact that underlying the procedures is the process of conflict, executive appraisal and goal congruence. The latter factors are mentioned, but not analyzed adequately-- because the concept of transfer pricing is accepted for all situations. What is suggested here, is that the transfer price should be questioned under certain circumstances and not taken as a given.

This research is designed to test only a portion of the aforementioned model (Figure 4), namely, that (1) the nature of the evaluation/reward system, (2) the awareness by the negotiating parties of an outside market for the intermediate product and (3) the importance, to the parties, of the transferred products are all determinants of the orientations and attitudes developed by the parties during the transfer pricing procedure. These, in turn, will affect the nature of the ongoing relationships between parties after the transfer pricing procedures have been completed. A schematic view of these relationships is shown in Figure 5.

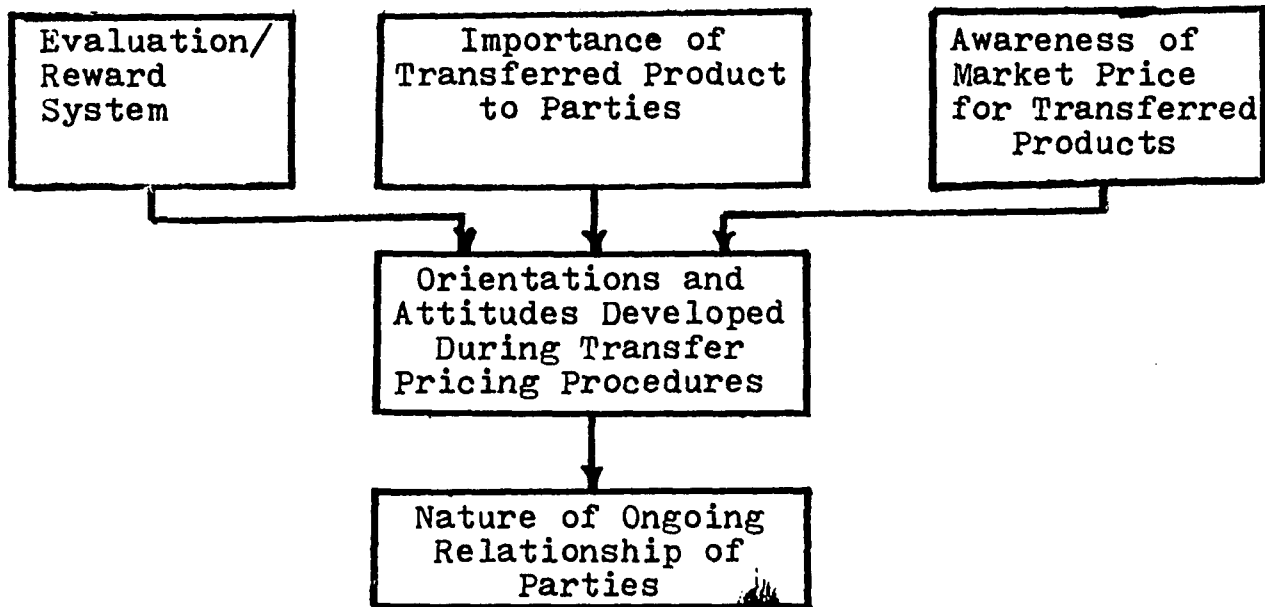


Figure 5 - Relationships Tested by Research

The following hypotheses will be tested:

- A. The more an evaluation/reward system is based on sub-unit profits (as opposed to company profits), the greater the development of a competitive (less cooperative) orientation during transfer price determination.

Walton and Dutton (1969) noted that the more the evaluation and rewards of higher management emphasize the separate performance of each department, the greater the conflict (as evidenced by a bargaining orientation in interdepartmental interactions). In their study of interdepartmental conflict, Walton, Dutton and Cafferty (1967) found that conflict of interest was positively correlated with interdepartmental conflict, with the former related to sub-optimizing incentives and a failure on the part of management to emphasize cooperation.

March and Simon (1958) state that the greater the differentiation of goals or differences in perceptions of goals, the more likely will intergroup conflict occur.

There is considerable support for the idea that a superordinate goal is useful in promoting problem solving in conflict situations (Blake, Shepard and Mouton, 1964; Burke, 1970; Filley, 1975; Maier, 1967; Sherif, et al, 1961; Walton and McKersie, 1966). Sherif, et al (1961) have been especially concerned with this aspect of conflict resolution, having completed a series of experiments confirming this general proposition.

Seiler (1963) showed how conflicting industrial engineering and development engineering groups were able to cooperate via problem solving when they were faced with a superordinate goal--the threat of dropping the project. Johnson and Lewicki (1969) point out that in order for the superordinate goal to be effective, it (a) must be seen by the parties as a natural event, (b) is not proposed by one of the parties and (c) is not perceived to be oriented towards conflict resolution.

B. The more important the transferred product is to the profit potential of each of the sub-units, the greater the competitive orientation (and the less the cooperative orientation) developed during transfer price determination.

Fisher (1964) has pointed out that small conflicts are easier to resolve than large ones. If the transferred

product is of minor importance to the parties, they become less interested and do not perceive the situation as conflictful. This reduces the latent and perceived conflict suggested by Pondy (1967) as possible conditions that bring about overt conflict. It likewise eliminates the factor of incompatible goals that Schmidt and Kochan (1972) indicate is a prerequisite for conflict. With little interest in or concern about the outcome of the transfer price process, one or both of the parties might be more amenable to withdrawal, compromise or smoothing (Blake, Shepard and Mouton, 1964).

- C. The greater the awareness of the sub-units of the existence of an outside market price for the transferred product, the less the development of a competitive orientation during transfer price determination.

This hypothesis is supported by several sources who point out that the greater the uncertainty or ambiguity in a situation, the more the potential for conflict (Dalton, 1959; Druckman, 1971; Dutton and Walton, 1966; March and Simon, 1958; Zald, 1962). Although these studies were oriented towards ambiguity in roles or goals, it is reasonable to predict that ambiguity, due to the absence of market prices, could also produce a conflictful situation. Both Schelling (1960) and Rappaport (1966) note that if a particular alternative is "prominent" or "conspicuous" it is likely to be chosen as a reasonable

solution. A market price would seem to be such a reasonable solution, thereby removing much of the bargaining pressures surrounding the transfer pricing process.

D. 1. The more aggressive, competitive behavior that occurs during the transfer pricing process, the less cooperative the subsequent relationships between the sub-units.

2. The more problem solving that occurs during the transfer pricing process, the more cooperative the subsequent relationships between the sub-units.

These hypotheses are derived from the widespread agreement on the functional attributes of a problem solving approach to conflict resolution (Blake and Mouton, 1961; Lawrence and Lorsch, 1967; Maier, 1967; Walton and Dutton, 1972; Walton, Dutton and Fitch, 1966), including the generally favorable attitudes that are developed during the course of joint problem solving situation as compared to a forcing or bargaining situation. Such attitudes should make subsequent relationships between the parties smoother, resulting in a more effective organization.

CHAPTER III

METHODOLOGY

Initially, an attempt was made to test a portion of the proposed model, exclusively, through the use of a field survey, since this should have the most external validity. However, a field approach had to be abandoned when it became evident that it would not be possible to get the cooperation of an adequate number of organizations to completely test the hypotheses under controlled conditions. The focus then shifted to a simulation experiment.

Research Design

A posttest-only, 2X2X2 fixed effects factorial design was used to test the aforementioned hypotheses.

The choice of this experimental design, particularly in reference to the use of posttest-only data was based on the arguments of Campbell and Stanley (1963). They state that pretests are not essential to true experimental designs and that ". . . the most adequate all-purpose assurance of lack of initial biases between groups is randomization. Within the limits of confidence stated by the tests of significance, randomization can suffice without pretest." (p. 25)

A pretest was deemed to be undesirable because of its "reactivity", which could have a deleterious impact on

both internal and external validity. When measuring attitudes, a pretest could bias the subjects, not only in respect to the posttest measurement, but in the experimental simulation itself. The pretest could very well divert subjects' attention away from the real goals of the simulation as they attempt to guess the goals of the experiment and the experimenter.

"Especially in attitude-change studies, where the attitude tests themselves introduced considerable amounts of unusual content, it is quite likely that the person's attitude and his susceptibility to persuasion are changed by a pretest" (Campbell and Stanley, 1963, p. 18).

The three independent variables chosen for study are:

- a) The existence or absence of a market price for the transferred product (2 levels)
- b) Whether or not the transferred product was important to the respective divisions (2 levels)
- c) The basis for the evaluation and reward of divisional executives (2 levels)

The experimental manipulation of each of these variables will be described in conjunction with the description of the simulation. Manipulation checks were made for each independent variable.

Description of Simulation

The vehicle used to simulate the transfer pricing process was a decision making exercise in which junior and senior undergraduate business students were randomly assigned to assume the roles of executives of either the Plastics Division or the Chemicals Division of the same

company (called the ABC Company). The relationship of the two divisions is shown in Figure 6.

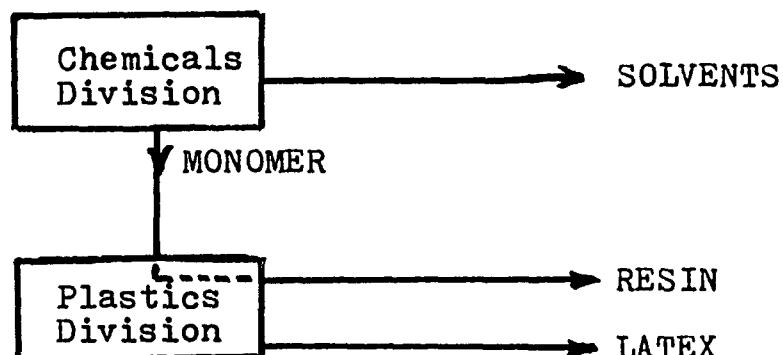


Figure 6 - Product Flow Diagram for Simulation

The Chemicals Division is a producer of two products, one called SOLVENTS and the other MONOMER. SOLVENTS are sold to an outside market, independent of the Plastics Division, in competition with up to eight other companies. The student "executives" were required to make a series of SOLVENTS decisions in which they chose price, marketing expenses and production level for the next month.

The second product, MONOMER, is produced only for the Plastics Division who subsequently converts it into a product called RESIN that is sold to an external market.

In similar fashion, the Plastics Division has two product lines. RESIN, as noted, depends on the availability of MONOMER from the Chemicals Division, its only source of supply. The second product, LATEX, is produced independently from the Chemicals Division. The student "executives" were required to make decisions similar to those made by the Chemicals Division for SOLVENTS--namely, price, marketing expenses and production level. They

were also in competition with up to eight other plastics companies.

Therefore, it can be seen that both sets of "executives" had to make two types of decisions--one in which they competed with outside firms (SOLVENTS or LATEX), independent of their sister division, and one in which they were dependent on the other division for either sale of product or purchase of raw materials. The simulation of the transfer price process involved only the latter decision. The first type of decision was used in an effort to reduce the students' perception of the simulation as simply a bargaining exercise. It was especially important to avoid such a perception for the situations in which the transferred product was meant to be of little importance. In the absence of this second task, the subjects could very well have perceived their entire task to be one of bargaining, since they had little else to do, thus reducing the impact of the manipulation concerning the importance of the transferred product.

The models for the SOLVENTS and LATEX industries are identical in every respect, except for the computer printout, in which labels are appropriately altered. The detailed model is shown in Appendix A. The concept of the model is similar to many others used as business games (Broom, 1969; Henshaw, 1972; McFarlan, 1970), but it is much simpler. This was necessary because of the time constraints imposed. Since the simulation was to take

place during the course of normal classes, run by other instructors, it was not feasible to use a sophisticated model that would require considerable class time for explanation and trial runs. Also, decisions had to be made within a 50-minute class period.

No model was needed for the MONOMER-RESIN decisions. Each "executive" was given graphs showing total and unit costs of either MONOMER or RESIN as a function of production level. They were told to meet with their counterparts in the same company and come to an agreement on the price and quantity of MONOMER to be transferred from the Chemicals Division to the Plastics Division. In order to simplify this decision and to keep total decision time within one 50-minute class period, the Plastics Division "executives" were told, via their instructions, that there was an unlimited outside market for RESIN; sales were limited only by the availability of MONOMER. Further, they were told that the price of RESIN was fixed by market conditions. Therefore, there was no need to decide on marketing expenses or price level. In fact, the profits generated by any combination of transferred quantity and price was entirely determined, since all costs were provided and all production could be sold at a constant price. This was quite different from the SOLVENTS-LATEX situation, in which profits could not be determined by the participants, since their sales depended not only on their own decisions, but on those of their competitors, as well.

A copy of the instructions given to each of the subjects is attached as Appendix B. The means by which the various manipulations were accomplished is described in Section D of this chapter.

The simulation continued for three decisions. Three decisions were chosen as a compromise between fewer decisions, which could inhibit the building of attitudes, and more, which was not feasible because of the class time pre-empted. The decisions were made, wherever possible, during three consecutive class periods. In three cases, there was a need to skip a class between the first and second decisions because of prior class assignments or holidays. Instructions were distributed by the instructor at the class meeting just prior to the first decision. The students were asked to read the instructions and to fill out a form in which they were asked to specify their objectives and outline a strategy to accomplish these objectives. The sole purpose for this request was to insure that all had read the instructions prior to the first decision session. This was not completely successful, as a number of students were still unprepared for this first session.

It was, of course, vitally important that the students take the simulation seriously and attend all of the decision making sessions. The instructors were asked to tell the students that they were going to be evaluated (graded) on their attendance as well as on their perform-

ance. The latter was to be based on meeting their own objectives; corporate or divisional profits as compared to those of their competitors; maintenance of adequate inventory levels of either SOLVENTS or LATEX; and the ability to reach a decision on the MONOMER transfer.

An effort was made to mask the true purpose of the simulation so that the subjects would not be in a position to try to either outguess the experimenter or try to give the experimenter what they thought he wanted. Therefore, the students were told that the purpose of the simulation was to determine how two divisions of the same company make decisions, with the focus on the objective measures of performance noted above. It was for this reason that a pretest was considered to be undesirable, since it would indicate to the subjects that attitudes toward the representatives of the other division were likely to be the critical aspects and purpose of the simulation.

Because of the short time available in which to develop attitudes, several schemes were used to increase the involvement of the subjects in the simulation and thereby speed up and ensure the development of attitudes of sufficient magnitude to permit their measurements. Weick (1965) has listed six ways to increase such involvement. Each of these will be discussed and its relevance to the simulation noted.

1) Involvement Through Instructions

Weick points out the hazard of lengthy instructions.

This can be the result of too many manipulations diluting the effect of any one; lengthy instructions induce caution on the part of the subject due to fear that he has forgotten some of the instructions and is behaving incorrectly. Weick suggests less elaborate manipulations and short instructions and that ample time should be allowed for subjects to become familiar with the demands and setting of the experiment. Thus, the instructions were limited to eight double-spaced typewritten pages with ample time given for answering questions relevant to the mechanics of the simulation prior to making the first decision. Profit data generated from the first decision were not used, to allow for some learning.

2) Involvement Through Hiring

This was not considered because of funding limitations and as noted by Weick, such hiring is inappropriate if subjects are to assume the role of top management.

3) Involvement Through Visibility of Performance

Weick states that "visibility is more likely to produce high involvement if the subjects are acquainted and if they also are likely to take the situation seriously. If there is the possibility that the situation will induce flippancy, the experimenter would be well advised either to

reduce the visibility of actions or select a population of persons who are unacquainted."

(p. 251) Since the latter is impossible in the experimental setting, the former approach was followed--performance of the individual divisions was not publicized until the simulation was complete.

4) Involvement Through Exchange

This was accomplished via reward for performance, namely, grades, although Weick notes that such a reward is seldom influential in increasing involvement. He suggests prior rewards to "obligate" the subject. Such an approach was not considered to be feasible, since no such reward was available.

5) Involvement Through Performance Data

Weick argues that feedback of performance in terms of errors made is more meaningful than feedback in terms of profits. He feels that if poor performance is attributed to the experimenter rather than to themselves, subject involvement is apt to suffer. Such was not the case with this simulation. Any poor performance was considered by the subjects to be the result of their own poor decisions as well as the superior decisions of others. In this situation, involvement is increased. "To the extent that the blame ramifies internally, a vivid experience is apt to result." (p. 253)

6) Involvement Through Tasks

Weick urges the use of tangible rather than intellectual tasks and novel, rather than routine, tasks. Both of these approaches were used. Certainly the task was tangible, with objective results fed back to the subjects. However, the novelty of the simulation was the major factor. The students had never had the experience of combining decision making (with which many were familiar, having participated in business games) with interpersonal activities. They seemed to be genuinely intrigued with the experience. Two further means were used to increase subjects' involvement through the task. The first, was the decision to have pairs of subjects make decisions, rather than for individuals to do so. This doubled the number of subjects, but it did provide an opportunity to build up ethnocentrism. The second technique was the use of graphs, rather than tables to provide cost-volume data. It was felt that this provided more opportunity for intragroup interaction. Weick notes another potential problem for the experimenter--task redefinition. He indicates that such redefinition can be caused by (a) availability of more information than is needed, (b) situation raises the salience of outside definitions and (c) the subject is

threatened by the experimental situation. He suggests minimal contact between the experimenter and the subjects (not practical in this situation because of the need to answer questions); situations that have little resemblance to prior situations (the negotiation phase is congruent with this recommendation, although the other phase of decision making was not, for those who had already played a business game); situations which require little effort to be understood (not applicable here, since the simulation is novel and moderately complex); situations which minimize "embarrassments" (accomplished by limiting visibility of performance).

Sample

The subjects were junior and senior business students enrolled in experiential courses at Baruch College, the University of the City of New York, as well as students enrolled in an experientially oriented organization behavior class, a planning class and in a simulation class at Saint Peter's College in New Jersey. The original intent was to use MBA students exclusively, since they were likely to be more sophisticated in business matters and therefore more likely to relate to and understand the simulation. However, this was not feasible, since the simulation ultimately required three decision making sessions. Since the MBA classes only meet 14-15 times per

semester, this was believed to be too drastic a drain on class time. The undergraduate courses, on the other hand, meet at least twice a week and the researcher would be more likely to receive the cooperation of the instructors.

Since the subjects were paired, four were needed for each decision unit (two for each division). Per Ward (1970) six replications were decided upon. With eight cells needed for a 2X2X2 experimental design, a goal of 192 subjects was set ($2 \times 2 \times 2 \times 6 \times 4 = 192$).

The various manipulations were randomly assigned to the classes and the students randomly assigned to specific divisions and teams (companies).¹ Class size varied from nineteen to thirty-seven students; a total of eight classes were ultimately used to complete the experiment, using 184 subjects. The only non-random aspect of student assignment was a prior consultation with the instructor to ensure that obviously close friends were not assigned to opposite divisions of the same simulated company.

No attempt was made to account for differences in personality, sex, age, class, prior business experience, schools. It was felt that these differences would be handled by randomization. The effectiveness of the randomization procedure relative to the actual distribution of male and female subjects over the various

¹Students were assigned to divisions and teams in alphabetical order. Manipulations were assigned in sequential order, so that all treatment combinations were represented in each class.

treatment combinations (cells) was checked using chi-square analysis ($\chi^2 = 5.7, df = 3$). Since this value of chi-square is not significant at $\alpha = 0.10$, it can be assumed that male and female subjects were randomly distributed over the various cells.

All instructions, classes and schools were represented in each cell.

All subjects were debriefed following the last decision and were given the final computer printouts and data to indicate which group best achieved its objective.

Manipulations of Independent Variables

All three variables were manipulated via the written instructions provided the subjects. The manipulations were checked by requesting that the students complete a post-experiment questionnaire (Appendix C, Part I).

Market Price for Transferred Product

This manipulation was accomplished simply by stating in the instructions that there was or was not an outside market for MONOMER, and if so, stipulating a price.

The specific instruction relating to the existence of a market price was as follows:

A product very similar to MONOMER is available on the outside market at a price of 15 cents per pound, delivered in 55 gallon drums (about 350 pounds per drum) or 14.5 cents per pound, delivered in 8000 gallon tank cars. Although ABC policy does not normally require divisions to purchase raw materials from each other, in this case it is required, since the company wants to keep MONOMER product specifications confidential.

Orally, the subjects were told that the 15 cents per pound price was an average price, with actual prices varying from 14-16 cents per pound. This was done to draw particular attention to the market price, since in a pilot study, this manipulation did not seem to be working. As will be seen, this was still not an effective manipulation.

For the situation in which a market for MONOMER did not exist, the following instructions were given to the subjects:

MONOMER is a specialty chemical that is made especially and only for the Plastics Division. It is not available on the open market, nor is it likely to be, since ABC holds the key patents covering its manufacture.

Importance of the Transferred Product

This variable was manipulated by adjusting some of the model parameters for both segments of the decision making exercise.

For the situation in which the transferred product, MONOMER, was important, the capacity of MONOMER and RESIN, was increased by a factor of ten, compared to the situation in which it was not important. With constant unit costs and prices, this had the effect of changing the profit potential for MONOMER or RESIN by approximately a factor of ten.

At the same time, the parameters of the SOLVENTS and LATEX models were changed by reducing by a factor of ten the capacity of the products, prior marketing expenses, inventory level and the ordinates of the cost-volume

graphs provided the students. All of these were provided to the subjects in their written instructions. The changes in the computer program are noted in Appendix A.

In order to inform the subjects of the importance of transferred product prior to the return of the results of their first decisions, the following statements were included in the instructions:

- (i) For the situation where transferred product was important:

"You might be curious as to the relative impact of the different products on your potential profitability. This is very difficult to predict for any particular team, since your profits will obviously depend on the quality of your decisions as well as those of others. However, in past exercises of this type, SOLVENTS (or LATEX) have brought in profits of about \$2,000 - \$5,000, while MONOMER (or RESIN) profits have been in the range of \$25,000 - \$80,000."

- (ii) For the situation where transferred product was not important:

"You might be curious as to the relative impact of the different products on your potential profitability. This is very difficult to predict for any particular team, since your profits will obviously depend on the quality of your decisions as well as those of others. However, in past exercises of this type, SOLVENTS (or LATEX) have brought in profits of \$25,000 - \$80,000, while MONOMER (or RESIN) profits have been in the range of \$2,000 - \$5,000."

Evaluation and Reward of Divisional "Executives"

Two alternatives were considered, one in which the evaluation is primarily on the basis of divisional performance and the second primarily on the basis of corporate performance. The specific instructions for this manipulation are as follows:

- (i) Divisional Performance:

"Top Management of ABC Company believes in decentralization and has set up the Divisions as independent profit centers. In line with this policy, top management does not get involved with interdivisional matters such as the determination of the prices and quantities of materials transferred within the Company. Further, the executives of the respective divisions are evaluated and rewarded on the basis of total profit center performance to the extent that about 80 percent of their total compensation package (including base salary, bonuses, stock purchase benefits) is dependent on divisional profit performance. As such, this will be representative of your team's evaluation."

(ii) Corporate Performance:

"Top management of ABC believes in decentralization and has set up the Divisions as independent profit centers. They therefore do not get involved in interdivisional matters such as the determination of price and quantity of goods transferred between Divisions. In spite of the commitment to decentralization, top management believes that executive evaluation and reward systems should be based to a large extent on corporate, rather than divisional profits. They want to be sure that the Divisions cooperate with each other to maximize total ABC profits, rather than trying to maximize their own profits, irrespective of its impact on corporate profits.

Therefore, the ABC evaluation/reward system is such that 80 percent of executive compensation (including base salary, bonuses and stock purchase benefits) are based on corporate, rather than divisional profits. This will also be the basis for your own evaluation."

There was little guidance available, in the literature, as to how corporate or divisional performance affected executive rewards. In fact, the only data available were provided by the Conference Board, who had just completed a survey on this subject.¹

Unpublished and unofficial results indicated that of 211 companies responding to their survey, 53 evaluated and

¹The data are those presented by Mr. Harland Fox of The Conference Board. Final report is expected to be issued late in 1977.

rewarded executives on the basis of only divisional profits, while 109 were evaluated on the basis of corporate and divisional profits. The remainder (49) did not use financial performance. For those that used both corporate and divisional performance, the median split was 25 percent on corporate performance and 75 percent on divisional performance. The maximum impact of divisional performance was such that 90 percent of bonus (not total compensation) was based on divisional performance. On the other hand, corporate performance, at most, accounted for 60 percent of the bonus basis. Notwithstanding these preliminary data, it was decided to use 80 percent as the basis for evaluation, in order to be certain that the manipulation was effective. The actual percentages were not considered to be too significant to these naive subjects.

It should be noted that the subjects were told that they were to be evaluated and rewarded (by grades) on the same basis as that used for the executives.

Dependent Variables

Those dependent variables that were derived from attitude scales were measured immediately after the subjects completed the third decision, but before they received the results of this decision. Initially, the dependent variables were expected to be limited to these attitude scales. However, as the simulation progressed, it appeared that two other variables could be of interest.

One of these was an objective measure--the profits actually achieved by the various divisions and companies. The second was an observation of the presence or absence of consultation and cooperation by the representatives of the two divisions in making SOLVENTS or LATEX decisions (which did not require such interaction). Each of these will be discussed separately.

Attitude Toward Other Division

This dependent variable was measured by a twelve item, six interval, semantic differential scale. The specific items were chosen from among those used by others in their studies of conflict or bargaining (Hunger, 1973; Oskamp and Klunike, 1970; Stern, Sternthal and Craig, 1973; Yukl, 1974). The scale and the instructions for its use are shown in Appendix C, Part II.

Intergroup Conflict Management

A search of relevant literature failed to unearth a suitable conflict management measure. One approach that had been used, the Lawrence and Lorsch (1967) proverbs, was eliminated from consideration because it was felt that the student subjects would lack an appreciation of the abstraction inherent in the scale.

Instead, a new 18 item scale was developed which was partially based on the conflict scale used by Renwick (1975) and one under development by The Institute for Social Research (1975). Unfortunately, neither scales

have had either reliability or validity checks.

Renwick used one item for each of five of the methods of conflict resolution identified by Blake and Mouton (1964). Her five statements are as follows:

- (i) Refrain from argument, try not to get involved (withdrawal)
- (ii) Play down the differences and emphasize common interests (smoothing)
- (iii) Search for an intermediate position, try to find a compromise (compromise)
- (iv) Use the power of my position or knowledge to win acceptance of my point of view (forcing)
- (v) Bring the problem clearly into the open and carry it out to resolution, even if feelings are likely to get hurt (problem solving)

For each of these, subjects were asked to indicate how likely they were to use each method to deal with differences and disagreements that occurred between them and another member of their organizations. The five-interval response was anchored with "very likely" and "very unlikely" (Renwick, 1975, p. 418). The first three statements were included in the final scale as is; the last two were slightly modified prior to inclusion.

The second source of scale items was an Intergroup Relations instrument under development by the Institute for Social Research (1975).

This is one of the modules developed by the Institute as part of the Michigan Organizational Assessment Package. It consists of a series of statements probing the respondents' perceptions of the way different groups function in

their organizations, the results of conflicts between groups and the methods used to resolve conflicts. The latter segment was composed of 14 statements, with emphasis on withdrawal, smoothing, problem solving and use of third parties. None of these statements was used exactly as written, but a number of them were included in the final scale after some modification to make them more relevant to the simulation situation. Third party resolution was not relevant to the simulation and was omitted. It is, however, relevant to real transfer price situations.

Neither Renwick nor the Organizational Assessment Package included persuasion as a mode of conflict resolution. However, it was felt that this would be a likely approach to transfer prices. Therefore, three statements were developed based on Wexley and Yukl's (1976) conception of persuasion.

The final 18 statement scale is shown in Appendix C, Part III.

It consists of three statements for each of the six aforementioned modes of conflict resolution. A six interval Likert-type scale (Very Likely to Very Unlikely) was used to assess the likelihood of the subjects using each of the modes to resolve future disagreements between themselves and representatives of the other division.

Post-Decision Interdivisional Cooperation

A major goal of the research was to explore the aftermath of transfer price decision making. An attempt

was therefore made to design a measuring instrument that would indicate a propensity on the part of the "executives" of the two divisions to cooperate in the course of subsequent interactions.

Five hypothetical incidents were developed, each one covering a likely source of interdivisional interaction. Each incident was set up so that one of the divisions would be asked to give up something in order to help the other division and the overall company. The subjects were then given five possible responses to the dilemmas posed by the incidents.

The incidents involved the following situations:

- (i) The transfer of a key middle level manager of one of the divisions to handle an important inter-divisional liaison position
- (ii) One division has completed a market research project that would be useful to the other division
- (iii) One division has an adequate warehouse. The other division has suggested that a new joint facility be constructed
- (iv) One division is asked to substitute a research project initiated by the other division for one of its own projects
- (v) One of the divisions is asked to help solve a technical problem for a customer of the other division, who is a potential competitor

The complete description of the five incidents and the five possible responses are shown in Appendix D.

During the course of the decision making exercise, it was noticed that some of the "executives" seemed to be having more interaction with the "executives" in their sister divisions (in the same company) than did some other

"executives". The occurrence and nature of this interaction was also included as a dependent variable in the research. Unfortunately, this systematic observation was not begun until approximately half of the simulations were completed. The specific observation recorded was the number of times the "executives" of the related divisions cooperated in making decisions for either SOLVENTS or LATEX. In contrast to the decisions made for the transferred product, MONOMER, no such contact was necessary, since the SOLVENTS and LATEX decisions were completely independent of each other. Such consultation and cooperation in the simulation was entirely spontaneous and is believed to be an indicator of the likelihood that the "executives" would cooperate with each other following the negotiations.

Performance Evaluation

Three objective measures of performance were used in the research. The first measure was the total profits derived from MONOMER and RESIN, those that are dependent solely on the transferred product. The cost-volume graphs had been designed to that there was a quantity of MONOMER that optimized total company profits. This profit was entirely dependent on the decisions made by the "executives" during negotiations and was not affected by the decisions of others. The second measure was the profit derived from SOLVENTS and LATEX. This measure was decided upon after noting that the two division "executives" were,

at times, consulting with each other in making SOLVENTS/LATEX decisions, products not involved in the interdivisional transfer. Possibly such consultation could have an impact on the profits of the non-transferred products as well as on the transferred material. The third measure used was the total profit derived from all products of both divisions. This profit measure is obviously not independent of the other two measures.

Data Analysis

Other than the profit measures, all dependent variable data are probably ordinal measures, that is, the rank order is known, but the distances between ranks are not known. Therefore, parametric statistics theoretically are not applicable, since the assumptions underlying their use are not met. However, Labovitz (1970) argues that except for extreme situations, interval statistics can be applied to any ordinal-level variable. "Although some small error may accompany the treatment of ordinal variables, as interval, this is offset by the use of more powerful, more sensitive, better developed, and more clearly interpretable statistics with known sampling error" (p. 515).

Much of the analyses was done using parametric statistics, primarily because adequate non-parametric procedures are not available and also because of the large sample size available. Thus, the t-test was used to determine the effectiveness of the independent variables manipulations, and factor analysis was used to reduce the

dimensionality of the conflict resolution scale.

Multivariate analysis of variance (MANOVA) was used to analyze the impact of the independent variables on some of the dependent variables, namely, attitude and approach to conflict resolution. MANOVA was used as a screening technique, after which univariate analysis of variance (ANOVA) was used to determine which of the dependent variables caused whatever differences occurred. The use of these parametric techniques requires that the data must satisfy the following assumptions:

- interval or ratio measures
- samples are drawn at random
- errors are normally distributed
- errors are independent
- errors have the same variance for each treatment combination
- effects are additive

Hays (1973), in discussing the importance of these assumptions for the fixed effects ANOVA model, notes that "inferences made about means are valid even when the form of the population distribution departs considerably from normal, provided that the 'n' in each sample is relatively large" (p. 481). This follows from the central limit theorem. The assumption of independent errors is serious, but is probably not violated since the data are all based on independent observations, without repeated observations of the same subjects.

Hays notes that the "assumption of homoscedasticity

can be violated without serious risk, provided that the number of cases in each sample is the same" (p. 482). Unfortunately, this could not be achieved in the experiment, although the original intent was to have equal cell frequencies. Actual cell sample size varied from 18 to 29 individual subjects. The unequal size resulted from the absence of subjects and from a desire to get an increased number of observations of groups in the no-market price category, to check the unobtrusive measure noted previously--the number of unsolicited cooperative interactions experienced by the group as they made their decisions. As will be discussed later, the market price--no market price manipulation was not successful--and the experimental design was therefore collapsed to a 2X2 design. In this case, the sample size per cell increased, and its range was reduced to 42-49 individual subjects per cell.

Because of the unequal cell size, the experimental design was no longer orthogonal, although the observations were still randomly and independently sampled. As Li (1964) points out, this does not change the assumptions or hypothesis, but does change the method of calculation of sums of squares and does increase the probability of committing a Type II error. The interpretation of ANOVA results does differ because of the unequal cell frequencies, since the main and interaction effects are not orthogonal, and these effects are neither additive nor independent of each other.

Because of the unequal cell frequencies, the calculation of sums of squares was accomplished through the use of a linear regression approach.

There are at least three different ways in which the main effects sums of squares can be calculated for the case of unequal cell frequencies. As recommended by Kerlinger and Pedhazur (1973) and by Overall and Spiegel (1969), the so-called experimental design analysis was used. According to Overall and Spiegel (1969), this method ". . . should be employed whenever the problem is conceived as a multiclassification factorial design and where conventional analysis of variance might have been employed except for unequal cell frequencies or other computational difficulties" (p. 319).

The complete linear model analysis was not used because for this model, ". . . care should be taken not to interpret significant 'main effects' in the same way that one might interpret a significant main effect from a balanced factorial design. Powerful suppressor effects are not uncommon between classification variables and their interactions" (p. 319).

Non-parametric tests were used to test the significance of the effect of the independent variables on profits, even though the data are interval, since it is expected that the distribution will not be normal, variances are not expected to be equal and sample size per treatment is small. The Mann-Whitney U Test is used to

test for the difference in central tendency.

A non-parametric technique was needed to test the effect of the independent variables on the cooperative behavior measure, since sample size was small and the data were dichotomized. Although there were three decision periods, only the last two were used for any data collection, with the first period reserved for learning. The data were dichotomized into (a) no cooperative interactions and (b) at least one cooperative interaction. In the absence of any known two way non-parametric analysis of variance technique for independent observations, the data were analyzed via contingency tables, using the Fisher Exact Probability Test.

Pilot Test

In order to test the effectiveness of the simulation and the manipulations, a pilot test was conducted. Nineteen subjects were exposed to all four experimental conditions under the no-market price condition. This test also served as a useful practice session to debug the simulation and the computer program, to see whether the outputs were reasonable and understandable to the subjects, to be certain that three decision periods were adequate to develop the attitudes expected, and finally, to ensure that the decisions could be made within a fifty minute class period.

The results of the pilot test were generally favorable. The computer program was satisfactory and only

minor parameter changes were needed. The instructions were understood and the decision making exercise proceeded as expected. The computer printout, however, was found to be somewhat confusing and this was modified in subsequent runs to make it more easily interpreted. This required some additional labeling and format changes.

It was evident that two of the three manipulations, basis for evaluation and importance of the transferred product, were successful. The third manipulation, concerning the existence of a market price for the transferred product was not successful. Of the 19 subjects participating in the test, only 10 correctly perceived the absence of a market price, whereas 5 thought that there was a market price and 4 were not sure. In post-test discussions, the students who were incorrect or not sure, stated that they had either forgotten about the market price, had mistakenly considered the final product, RESIN, rather than the transferred product, MONOMER, or had simply not understood what was meant by market price.

In all later runs, particular attention was drawn to the presence or absence of a market price and in the manipulation check, the words "for the transferred product, MONOMER", was underlined. As will be seen, this was still not effective, and the manipulation of the market price variable was unsuccessful.

CHAPTER IV

RESULTS

The experimental data will be presented in four segments:

- Effectiveness of independent variables manipulation
- Reliability and factor analysis of dependent variable scales
- Testing the various hypotheses
- Miscellaneous observations and findings not directly related to hypothesis testing

Effectiveness of Manipulations

Market Price/No Market price for Transferred Product

To test this manipulation, the subjects were asked to answer the following question, immediately after completing the third decision:

"Were you aware of the existence of a market price for the transferred product, MONOMER?"

They were given three response choices--yes, no, not sure.

Table 1 shows the results of the manipulation check for this independent variable. It can be seen that less than fifty percent of the subjects correctly perceived that there was no market price for the transferred product in the situation in which there was actually no market price. On the other hand, for the situation in which

TABLE 1

INDEPENDENT VARIABLE CHECK - ABSENCE
OR PRESENCE OF MARKET PRICE
FOR TRANSFERRED PRODUCT

	CONDITION A - THERE WAS A MARKET PRICE		CONDITION B - THERE WAS NO MARKET PRICE	
	<u>NUMBER</u>	<u>%</u>	<u>NUMBER</u>	<u>%</u>
Subjects Who Thought There Was a Market Price	66	84.6	45	42.5
Subjects Who Thought There Was No Market Price	8	10.3	49	46.2
Subjects Who Were Not Sure	<u>4</u> 78	<u>5.1</u> 100.0%	<u>12</u> 106	<u>11.3</u> 100.0%

there was a market price, 84.6 percent of the subjects correctly identified the situation.

Post-decision discussions with the subjects often pointed out that many of them simply did not understand the significance or meaning of the term "market price". Others, as in the pilot test confused it with the price of one or more of the other products, but still seemed to be generally aware of the fact that perhaps the MONOMER situation was different than for the other three products. Most of them just did not seem to be sure. For this reason, another analysis was performed to determine whether the manipulation was actually effective, even though the subjects might not have realized the significance of the term, "market price for the transferred product". This analysis concerned the actual agreed upon transfer prices. It was hypothesized that if the subjects were indeed affected by the manipulation, the average agreed upon transfer price for the two conditions should differ, with the market price condition being closer to fifteen cents per pound (the stipulated market price in their instructions) than the no market price condition. Further, the variance of the prices in the latter condition should be greater because of more uncertainty and the absence of a "prominent" solution.

Table 2 presents the results of this analysis. As expected, the variance of the no-market price situation was significantly greater than for the market price

TABLE 2

AGREED UPON PRICES AS A FUNCTION
OF EXISTENCE OF MARKET PRICE

	<u>Decision #2</u>		<u>Decision #3</u>	
	<u>Market Price</u> n=20 (1)	<u>No Market Price</u> n=28 (1)	<u>Market Price</u> n=21 (1)	<u>No Market Price</u> n=28 (1)
Mean Agreed Upon Price	13.48	14.03	13.41	13.95
	t=1.08, df=46, n.s.		t=1.26, df=47, n.s.	
Variance of Agreed Upon Price	1.69	4.40	0.98	3.13
	F=2.61; df=27,19; p<0.05		F=3.20; df=27,20; p<0.01	

(1) Does not include one case where no transfer price was agreed upon.

situation. This difference held for both the second and third decisions; both variances were less for the third decision. However, no significant differences were found between any of the mean prices. In fact, the means were even in the wrong direction, with the no-market price mean being closer to fifteen cents per pound (the market price for the transferred product) than the market price mean.

As a result of the uncertainty of the effectiveness of this manipulation as evidenced by the poor manipulation check and the inconsistent analysis of the transfer price data, this manipulation was ignored and the experiment was collapsed to a 2X2 design.

Importance of Transferred Product

This manipulation was checked by having the subjects answer the following question immediately after completing the third decision:

"What importance did you attach to the price level of the transferred product, MONOMER, in relation to the total profit potential of your division?"

The subjects were presented with a seven interval scale, anchored at "very important" and "of no importance".

The difference between the means of the two conditions (1.99 vs. 4.87) was highly significant ($t=18.8$, $df=182$, $p<0.01$), indicating that this variable was successfully manipulated.

The ranges of the profits experienced by the team was also checked to see if they were consistent with the intent of the manipulations.

- (a) For the situation in which the transferred product was intended to be important:

Transferred Products

MONOMER: From a loss of \$10,100 to a profit of \$90,000

RESIN: From a loss of \$150,000 to a profit of \$70,000

Open Market Products

SOLVENTS: From a loss of \$5,100 to a profit of \$13,510

LATEX: From a loss of \$2,290 to a profit of \$11,310

- (b) For the situation in which the transferred product was not intended to be important

Transferred Products

MONOMER: From a loss of \$800 to a profit of \$9,300

RESIN: From a loss of \$1,800 to a profit of \$6,200

Open Market Products

SOLVENTS: From a loss of \$41,500 to a profit of \$92,990

LATEX: From a loss of \$9,980 to a profit of \$132,700

Both the actual profits and the perceptions of the respective subjects indicate that this independent variable was successfully manipulated.

Basis for Evaluation and Reward of Executives

This manipulation was checked by having the subjects answer the following question, following completion of the third decision:

"On what basis do you think your profit performance

will be made?"

They were presented with a seven interval scale, anchored at "entirely on own division's profits" and "entirely on combined profits".

The difference between the means (2.58 vs. 5.28) was highly significant ($t=14.7$, $df=182$, $p<0.01$), indicating that this variable was successfully manipulated.

Analysis of Dependent Variable Scales

Attitudes Toward Other Division (Shown in Appendix C, Part II)

Following the completion of the pilot test, the split-half reliability of this scale, with the Spearman-Brown correction, was found to be 0.96.

The scale reliability was further checked by determining the correlation between attitude scores of subjects within the same division of the same company, and the correlation of summated scores between divisions of the same company.

The second procedure used to estimate the "reliability" of the attitude scale is not theoretically consistent with the definition of reliability as a measure of the reproducibility (repeatability) of test scores on the same individual. However, it does seem to follow the spirit of the definition of Guion (1965) who states that "as a basic concept, then, reliability can be defined as the extent to which a set of measurements is free from random-error variance" (p. 30).

Since it was not feasible to obtain a second set of measurements from the same individuals, the freedom from random-error was estimated by determining the correlation between attitude scores of subjects within the same division and the correlation of total scores between divisions of the same company (under the influence of the same set of independent variable manipulations). The Pearson coefficients were 0.71 ($p < 0.01$) and 0.77 ($p < 0.01$), respectively.

Intergroup Conflict Resolution Scale
(Shown in Appendix C, Part III)

A number of approaches were employed to test the reliability of this eighteen item scale.

Response Characteristics of Scale Items

First, frequency response data, histograms and descriptive statistics were determined to see whether the entire range of possible responses were utilized, and to determine whether any of the items had unusual response distributions. Of particular interest was whether the response distributions for the three items within each mode of conflict resolution were similar.

The histograms and descriptive statistics for each of the eighteen items are shown in Appendix E.

A brief discussion of items in each of the six subscales follows.

(i) Problem Solving (Scale items d, i, r)

All three items had similar response characteristics.

The complete six interval scale was utilized, but all three items were highly skewed to the left (in the direction of more likely use of problem solving to settle disagreements). This is not too surprising, since all of the subjects were undergraduate business students, mostly management majors, who had been exposed to the behavioral approach, and in many cases, were enrolled in an experimentally oriented behavioral class. The distributions were also quite flat at the lower end of the scale.

(ii) Smoothing (Scale items c, g, m)

All three smoothing items had very similar response distributions, somewhat less skewed to the left than the problem solving items, but with much less flatness. The responses covered the full interval range. The means, modes, and medians were almost identical.

(iii) Forcing (Scale items b, h, n)

The response distributions for this trio of items were inconsistent. Items "b" and "n" were unimodal, peaking at scale values of two or three, slightly skewed to the left. Item "h", however, monotonically increased, with a mode of six. All descriptive statistics for item "h" were also quite different.

Item "h" read as follows:

"Use any method available to you, such as threats, to coerce the other division to accept your point of view."

Within the context of this simulation, the use of threats and coercion is irrelevant, which probably explains

why 60 percent of the subjects checked off "very unlikely" (interval six). Because of the radically different response distribution and low interitem correlation, scale item "h" was eventually eliminated from the conflict scale.

(iv) Persuasion (Scale items e, k, q)

The frequency distributions for these three items were very similar, the mode, mean and median were almost identical, with item "q" somewhat skewed to the left and less flat than the other two items in this sub-scale.

A review of the wording of the statements offers a possible explanation for this difference. Whereas scale item "e" and scale item "k" use terms such as "convince the other division" and "persuade the other division", item "q" refers to "the use of logical and emotional arguments". Perhaps the relevance or understanding of the latter phrase could explain the difficulty. Notwithstanding this uncertainty, item "q" was retained, since it is not certain that it is actually causing a problem, and as will be noted later, it did load heavily on a major factor.

(v) Bargaining (Scale items f, l, o)

All three items had very similar response distributions, with essentially equivalent measures of central tendency and shape. All were skewed to the left (more likely to be used) and were somewhat peaked. These three scale items were the only ones, of the complete set of

eighteen items, that did not utilize the entire range of possible responses. No subjects indicated that they would be "very unlikely" to use bargaining to resolve future disagreements. Perhaps this should have been anticipated, since the exercise highlighted bargaining and compromise and the students just could not visualize not utilizing bargaining, compromising or splitting the difference to some extent.

(vi) Avoiding (Scale items a, j, p)

Each response distribution of these items was different. Item "a" was bimodal, item "j" was unimodal and item "p" increased monotonically. All were skewed to the right (very unlikely to be used to resolve future disagreements).

Because of the widely differing distributions and the fact that avoidance is not really a relevant conflict resolution mode for this situation, this sub-scale was eventually eliminated from the analysis.

Factor Analysis

The eighteen items of the conflict resolution scale were factor analyzed to determine the dimensionality of the scales.

The factors were extracted using principal factor analysis. In this procedure (as contrasted to the principal-component analysis), it is assumed that not all of the sample variance can be accounted for by the factors, i.e., communality is less than one (or uniqueness

is greater than zero).

The principal-component analysis has several shortcomings:

it is merely a transformation rather than the result of a fundamental model for covariance structure, . . . the forms of the components are not invariant under changes in the scales of the responses, no rational criteria exist for deciding when a sufficient proportion of the variance has been accounted for by the 'principal' components that are attributable only to the unreliability or sampling variation of the individual responses. (Morrison, 1967, p. 259)

The factors were then Varimax (orthogonally) rotated.¹

Three factors were found which account for 48.8 percent of the total variance and have some theoretical significance and relevance. The three avoidance items did not load on any of these factors and were not included. As previously noted, these items were to be eliminated in any event. Item "h" (forcing) loaded negatively on Factor 1, but was not used because of its unusual response distribution and its lack of relevance to the simulation situation.

The loadings of the items on the three factors are shown in Table 3. Factor 1 was labeled "Cooperative Orientation to Conflict Resolution", since all of the problem solving and smoothing items loaded on it. It is believed that the naive subjects perceive problem solving and smoothing to be quite similar, both evidence of a

¹Oblique rotation was also investigated, since this procedure allows for correlation between factors, and it was believed that some of the factors would be correlated. However, there was little difference seen in factor loadings between the orthogonal and oblique procedures.

TABLE 3

VARIMAX ROTATED FACTOR LOADINGS -
CONFLICT RESOLUTION SCALE

<u>SCALE ITEM</u>	<u>FACTOR 1 COOPERATIVE ORIENTATION</u>	<u>FACTOR 2 COMPETITIVE ORIENTATION</u>	<u>FACTOR 3 COMPROMISING ORIENTATION</u>	<u>COMMUNALITY</u>
c(Smoothing)	0.56 ¹	-0.10	0.16	0.35
d(Problem Solving)	0.77 ¹	-0.21	0.01	0.63
g(Smoothing)	0.53 ¹	-0.13	0.15	0.31
j(Problem Solving)	0.85 ¹	-0.18	0.01	0.75
m(Smoothing)	0.70 ¹	-0.16	0.08	0.53
r(Problem Solving)	0.86 ¹	-0.12	-0.07	0.75
b(Forcing)	-0.36	0.50 ²	-0.06	0.39
e(Persuasion)	-0.13	0.57 ²	0.05	0.34
k(Persuasion)	0.02	0.82 ²	0.09	0.68
n(Forcing)	-0.12	0.57 ²	-0.04	0.33
q(Persuasion)	-0.03	0.50 ²	-0.05	0.25
f(Bargaining)	0.04	-0.10	0.69 ³	0.48
l(Bargaining)	0.00	0.36	0.42 ³	0.31
o(Bargaining)	0.19	0.14	0.59 ³	0.40

¹These Scale Items were used to calculate a score for Factor 1.

²These Scale Items were used to calculate a score for Factor 2.

³These Scale Items were used to calculate a score for Factor 3.

cooperative approach to resolution.

Factor 2 was labeled "Competitive Orientation to Conflict Resolution", since both the persuasion and forcing items loaded on this factor. It is believed that the subjects viewed both of these modes in the same way-- an uncooperative, competitive approach to conflict resolution.

The third factor was called "Compromising Orientation to Conflict Resolution", since all three bargaining or compromising items loaded on it. It accounted for only 8.6 percent of the total variance in the data.

The relevant scale items were transformed to z-scores, weighted by factor score coefficients and summed to provide factor scores for subsequent analyses.

Correlation coefficients were then determined for the weighted factor scales and three comparable, unweighted factor scores, calculated by simply adding the scores for each of the respective items. These correlations are tabulated in Table 4. Since all correlations are 0.95 or greater, it was decided to use the simpler and more meaningful, unweighted scores for further analysis and hypothesis testing.

The correlation of these scores within and between divisions of the same company were determined to get a measure of the inter-subject "reliabilities" of the three sub-scales.¹ As can be seen from Table 5, the cooperative

¹See Page 92 for the rationale behind the use of this procedure.

TABLE 4

WEIGHTED AND UNWEIGHTED FACTOR SCORE CORRELATIONS

	PEARSON CORRELATION COEFFICIENT ¹
FACTOR 1 (Cooperative)	0.98
FACTOR 2 (Competitive)	0.95
FACTOR 3 (Compromising)	0.98

¹All coefficients were significant at the 0.01 level.

TABLE 5

"RELIABILITIES" OF CONFLICT RESOLUTION
SUB-SCALES

CONFLICT RESOLUTION SUB-SCALE	<u>PEARSON CORRELATION COEFFICIENTS</u>		<u>CRONBACH'S</u> <u>α</u>
	<u>WITHIN</u> <u>DIVISIONS</u> (n=84)	<u>BETWEEN</u> <u>DIVISIONS</u> (n=38)	
COOPERATIVE ORIENTATION SUB-SCALE	0.68 (p<0.01)	0.82 (p<0.01)	0.60
COMPETITIVE ORIENTATION SUB-SCALE	0.27 (p<0.02)	0.57 (p<0.01)	0.64
COMPROMISING ORIENTATION SUB-SCALE	0.10 (n.s.)	0.46 (p<0.01)	0.45

orientation sub-scale exhibits good inter-subject "reliability", with a Pearson correlation coefficient of 0.68 ($p < 0.01$) for within and between samples, respectively.

On the other hand, the other two sub-scales are deficient in "reliability". The competitive orientation sub-scale had a within division correlation coefficient of only 0.27 ($p < 0.02$), although because of the effect of summations, the between division correlation was 0.57 ($p < 0.01$).

The compromising orientation sub-scale had very poor "reliability". The within division correlation was only 0.10 and was not significant, although, again, the between division correlation was greater, 0.46 ($p < 0.01$).

Next, the correlations between the unweighted scores and the attitude scale were determined, and are tabulated in Table 6. The attitude scale and the cooperative orientation sub-scale were negatively correlated with the competitive orientation sub-scale, but the compromising scores were not significantly correlated with any of the other three scales.

These correlations lend some validity to the sub-scales, since it would be expected that a favorable interpersonal attitude would be negatively correlated to a competitive orientation and positively correlated with a cooperative orientation.

TABLE 6

INTER-SCALE CORRELATION COEFFICIENTS¹

	ATTITUDE	COOPERATIVE	COMPETITIVE	COMPROMIS:
ATTITUDE SCORE	1.0	0.75 ²	-0.39 ²	.0.02 ³
COOPERATIVE FACTOR		1.0	-0.33 ²	0.12 ³
COMPETITIVE FACTOR			1.0	0.14 ³
COMPROMISING FACTOR				1.0

¹Pearson coefficients for unweighted scores

²p<0.01

³Not significant

Post-Decision Cooperation Scale

This scale was intended to measure the propensity of the subjects to cooperate in future situations that require inter-divisional interaction, which might, in themselves, be conflictful. There was no such scale available and one was therefore developed, based on some past experiences of the researcher.

Five situations were described, with six possible courses of action that an executive might take in response to each of the decisions. Groups of undergraduates at Saint Peter's College were given the incidents and the responses in random order. They were asked to first rank each set of responses in terms of the degree of cooperation expressed in each statement, and then to assign numerical values, from one to ten, to each of these ranked responses.

A series of such judgments were made, with the wording of both the incidents and the responses modified after each judgment until the scale shown in Appendix D was finalized. It had only five possible responses to each incident, in order to increase the discrimination and simplify the scale. This final scale was judged by thirteen undergraduates who were successful in ranking the responses in terms of degree of perceived cooperation. The students made only 2, 3, 3, 7 and 6 errors, respectively, in ranking the five incidents. On this basis, the scale was included in the post-decision questionnaire.

It became immediately obvious during the pilot test,

however, that this scale would be a difficult one for the students to understand. They complained about its length and many were clearly randomly marking the responses, rather than trying to analyze the incidents, which did take about fifteen minutes to accomplish. Further, they seemed to be confused as to the purpose and meaning of the scale. The results were useless, with no consistency at all between responses.

In an attempt to increase interest and understanding, and to reduce the individual burden of answering the questions, a series of runs was made during which the last incident was eliminated and the subjects were asked to rank the responses to the incidents in cooperation with the other member of their division, thereby resulting in only one scale response per division. However, this was also not successful. The rankings were essentially random and the cooperation scale was therefore eliminated.

Testing Hypotheses

All hypothesis testing relating to scales and scores started with a MANOVA, followed by an ANOVA for those effects which were shown by MANOVA to be significant.

Because the scores of the subjects within each company cannot be considered to be independent measures, average company scores were used as the input data for these analyses, thereby reducing degrees of freedom. This was counterbalanced, to some extent, by reduced within cell variance due to the averaging procedure.

As described earlier, the market price manipulation was unsuccessful, and the original 2X2X2 experimental design was collapsed to a 2X2 design. Therefore, only the importance of the transferred product and the basis for executive evaluation, and their interaction were tested. Four dependent variables--attitude, and the three conflict resolution sub-scales were evaluated. Table 7 tabulates the mean values of the dependent variables.

The MANOVA data are tabulated in Table 8.

The two-way interaction was highly significant ($p < 0.0014$), as was the overall evaluation effect ($p < 0.0001$). The data were therefore further analyzed using ANOVA to determine which of the dependent variables were affected by the treatments.

The ANOVA data are tabulated in Tables 9-12. For the dependent variables, attitude toward the other division and cooperative orientation, the importance-evaluation interaction was significant at the 0.001 level. The dependent variable, competitive orientation, was significant at the 0.01 level; the variable, compromising orientation, was not significant. Because the interaction effect is significant, the additivity assumption for main effects is not met and the meaning of the F-values for these individual effects is subject to qualifications.

TABLE 7

MEAN VALUES OF FOUR DEPENDENT VARIABLES

Basis for Evaluation

	<u>Divisional Performance⁽¹⁾</u>				<u>Corporate Performance⁽²⁾</u>			
	<u>Attitude Toward Other Division⁽³⁾</u>	<u>Orientations Toward Conflict Resolution⁽⁴⁾</u>			<u>Attitude Toward Other Division⁽³⁾</u>	<u>Orientations Toward Conflict Resolution⁽⁴⁾</u>		
		<u>Coop-erative</u>	<u>Compet-itive</u>	<u>Compro-mising</u>		<u>Coop-erative</u>	<u>Compet-itive</u>	<u>Compro-mising</u>
Transferred Product Important	42.67	19.83	12.50	6.60	19.41	9.64	16.77	6.67
Transferred Product Not Important	37.50	16.17	14.17	6.69	30.41	12.50	14.97	6.99

(1) n=13 for both levels of importance

(2) n=11 for product important; n=12 for product not important

(3) Lower values indicate a more favorable attitude; maximum range of scores: 12-72

(4) Lower values indicate subjects more likely to use particular approach; maximum range of scores - Cooperative: 6-36, competitive: 5-30, compromising: 3-18

TABLE 8

MANOVA DATA FOR HYPOTHESIS TESTING

<u>HYPOTHESIS TESTED</u>	F-VALUE	DF	SIGNIFICANCE ¹ OF F-VALUE
NO OVERALL EFFECT OF EVALUATION SYSTEM	20.7	4,42	$p < 0.0001$
NO OVERALL EFFECT OF IMPORTANCE OF TRANSFERRED PRODUCT	1.41	4,42	$p < 0.25$
NO OVERALL INTERACTION EFFECT	5.54	4,42	$p < 0.0014$

¹Using the Pillai (1960) trace criterion

TABLE 9

ANALYSIS OF VARIANCE FOR ATTITUDE VARIABLE

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	SIGNIFICANCE OF F-VALUE
IMPORTANCE OF TRANSFERRED PRODUCT	72	1	72	1.9	<0.17
EVALUATION SYSTEM	2746	1	2747	72	<0.001
INTERACTION	795	1	795	20.8	<0.001
RESIDUAL	1718	45	38		
TOTAL	5313	48	111		

TABLE 10

ANALYSIS OF VARIANCE FOR UNWEIGHTED
COOPERATIVE ORIENTATION SCORE

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	SIGNIFICANCE OF F-VALUE
IMPORTANCE OF TRANSFERRED PRODUCT	4.4	1	4.4	0.4	n.s.
EVALUATION SYSTEM	572	1	572	53.8	<0.001
INTERACTION	130	1	130	12.2	<0.001
RESIDUAL	479	45	10.6		
TOTAL	1188	48	25		

TABLE 11

ANALYSIS OF VARIANCE FOR UNWEIGHTED
COMPETITIVE ORIENTATION SCORE

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	SIGNIFICANCE OF F-VALUE
IMPORTANCE OF TRANSFERRED PRODUCT	0.02	1	0.02	0.004	n.s.
EVALUATION SYSTEM	76	1	76	14.8	<0.001
INTERACTION	36.6	1	36.6	7.1	<0.01
RESIDUAL	232	45	5.2		
TOTAL	345	48	7.2		

TABLE 12

ANALYSIS OF VARIANCE FOR UNWEIGHTED
COMPROMISING ORIENTATION SCORE

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F VALUE	SIGNIFICANCE OF F-VALUE
MAIN EFFECTS	0.93	2	0.47	0.28	n.s.
IMPORTANCE OF TRANSFERRED PRODUCT	0.51	1	0.51	0.30	n.s.
EVALUATION SYSTEM	0.40	1	0.40	0.24	n.s.
INTERACTION	0.14	1	0.14	0.08	n.s.
RESIDUAL	75.9	45	0.36		
TOTAL	76.9	48	1.60		

The significance of the evaluation main effect can be analyzed by examining Figures 7-9. The ANOVA results indicate that this effect is highly significant ($p < 0.001$) for the dependent variables, attitude, cooperative orientation and competitive orientation. The meaning of these relationships can be seen by reviewing the data shown in Figures 7-9.

At both levels of importance of the transferred product, the subjects evaluated on the basis of corporate performance showed more favorable attitudes, more orientation toward cooperative conflict resolution and reduced orientation toward a competitive mode of conflict resolution. Thus the significant F-value for the evaluation main effect has meaning over the range of importance tested. However, in each case, the difference is greater when the transferred product is important than when it is not, hence the significant interaction effect.

The lower halves of Figures 7-9 indicate that the direction of the differences in the values of the dependent variables differ for the two levels of importance, depending on whether the basis of evaluation is divisional or corporate performance. For corporate evaluation and an important transferred product, more favorable attitudes developed, there was more orientation toward cooperative conflict resolution and decreased orientation toward pressuring during conflict resolution, than if the transferred product was not important. When

Figure 7
Interaction Effect -

Attitude Towards Other Division

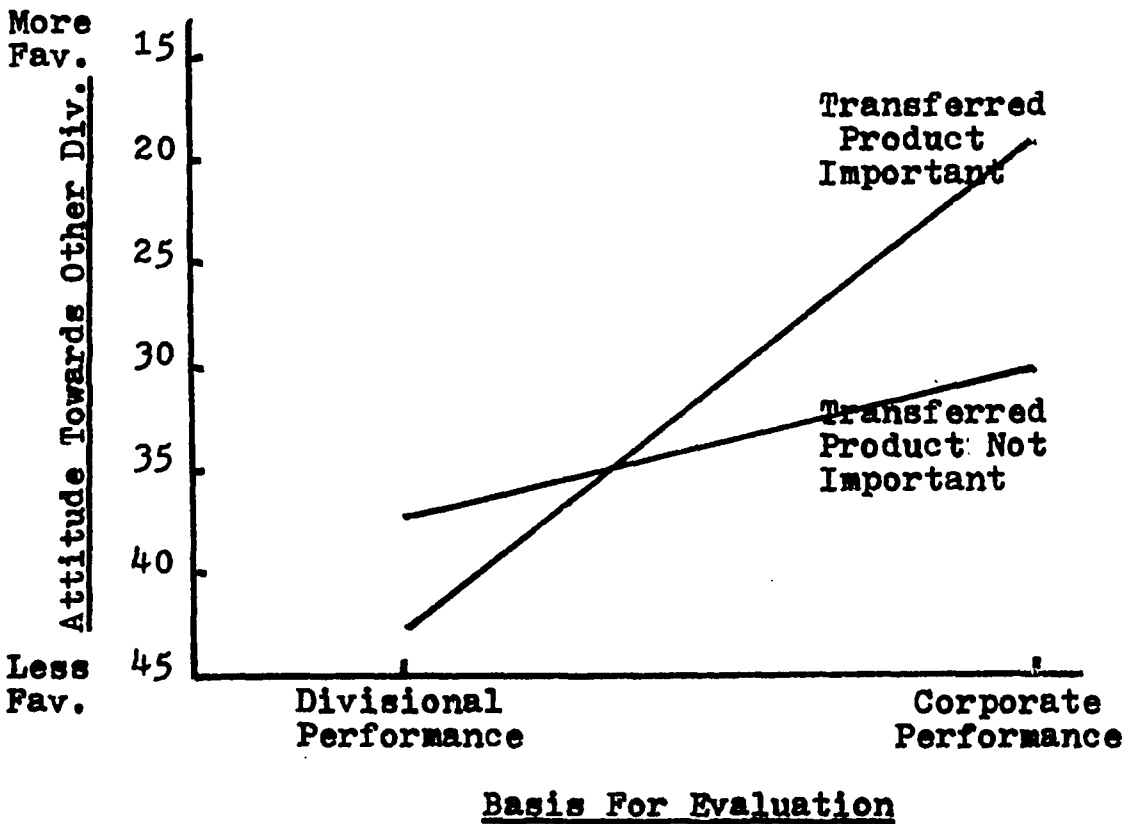
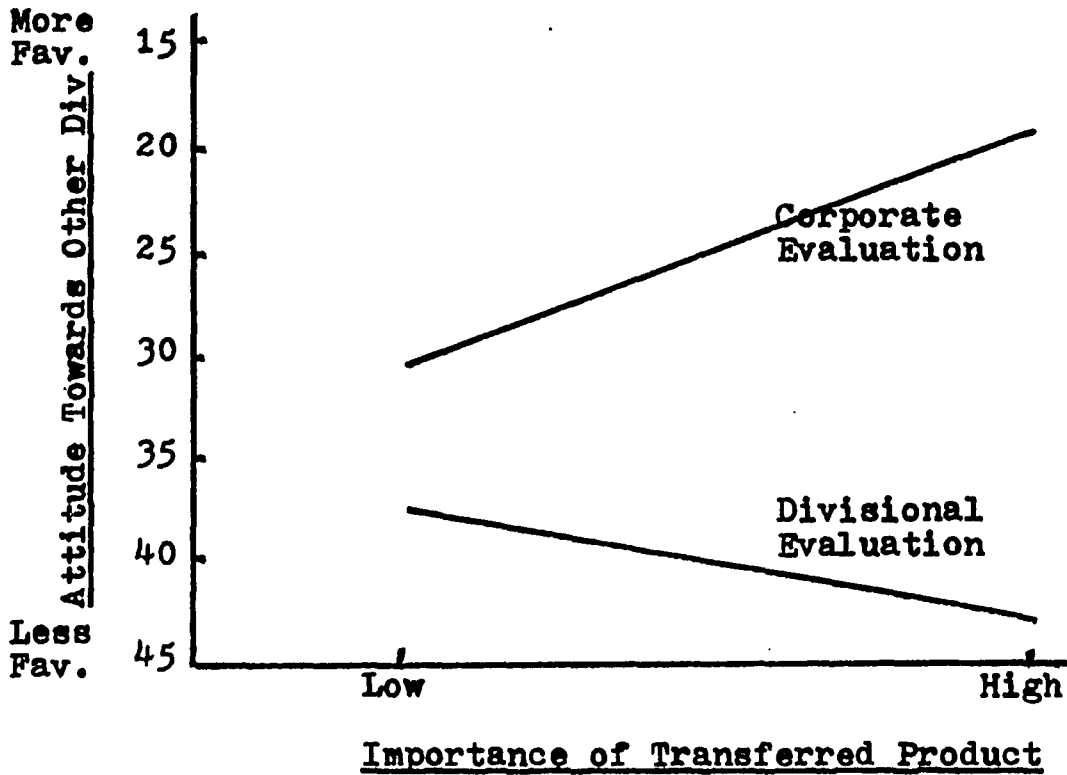


Figure 8

Interaction Effect -
Cooperative Orientation

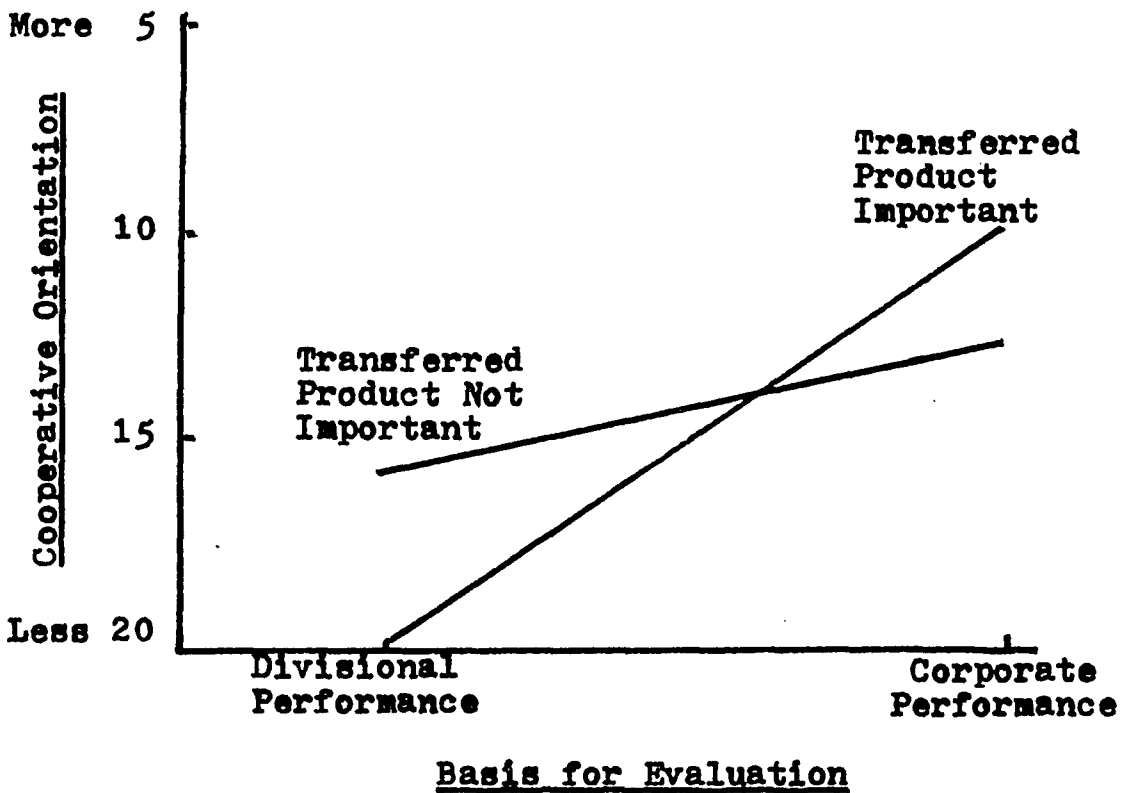
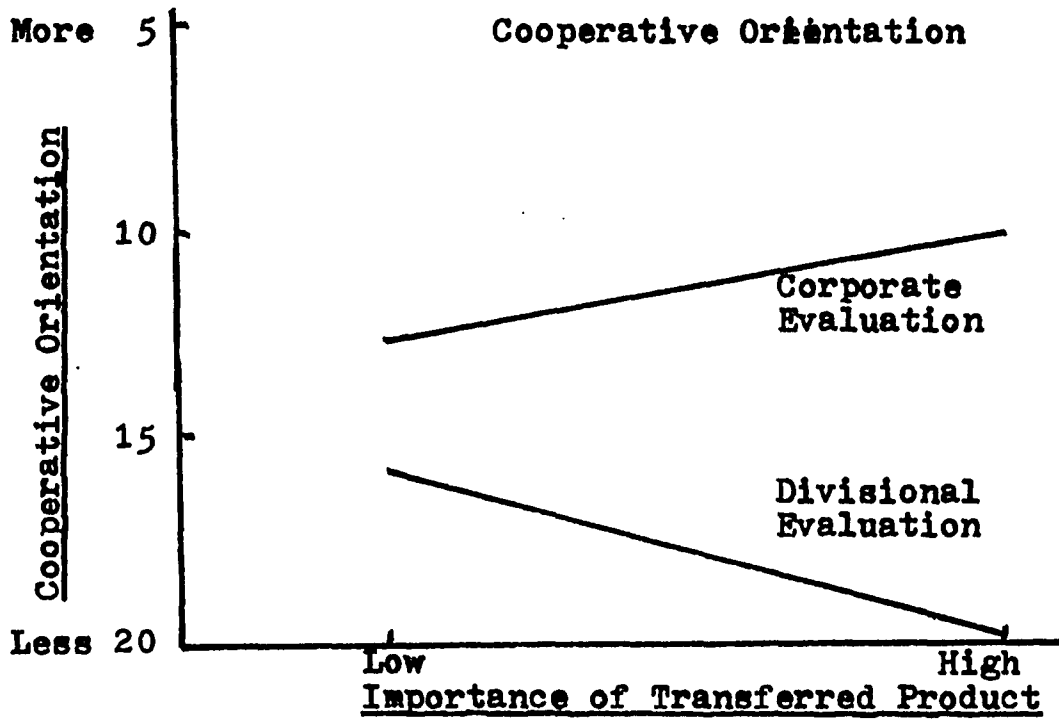
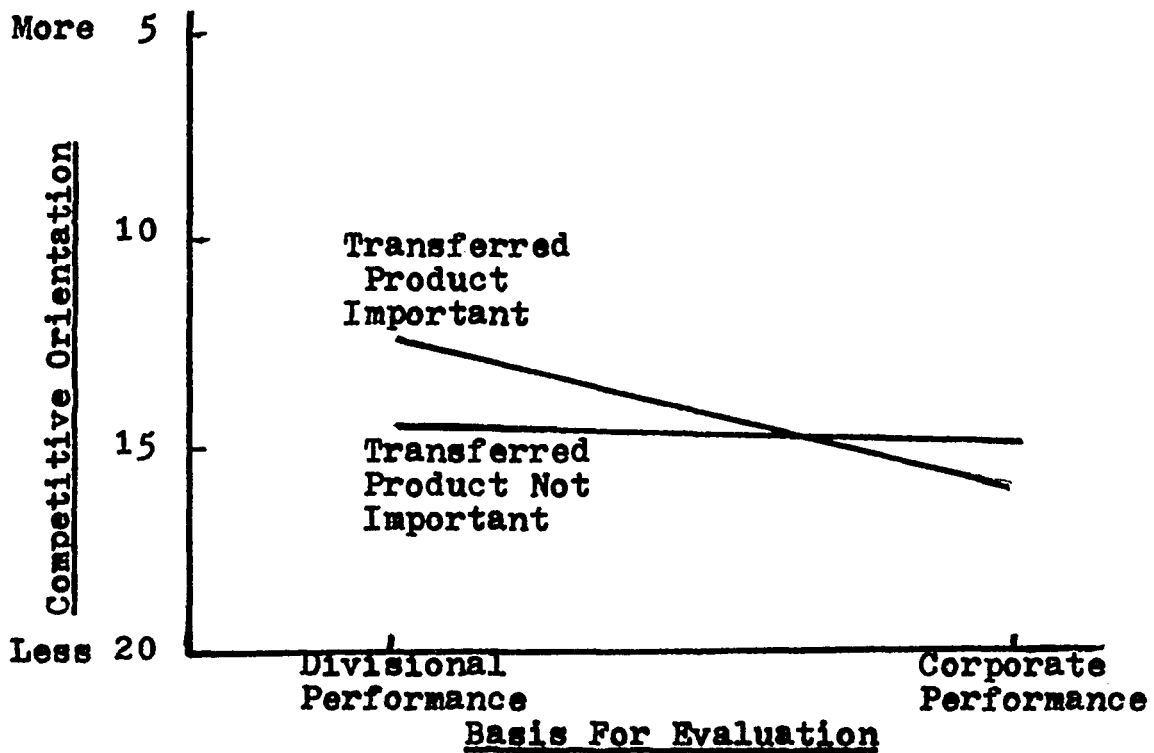
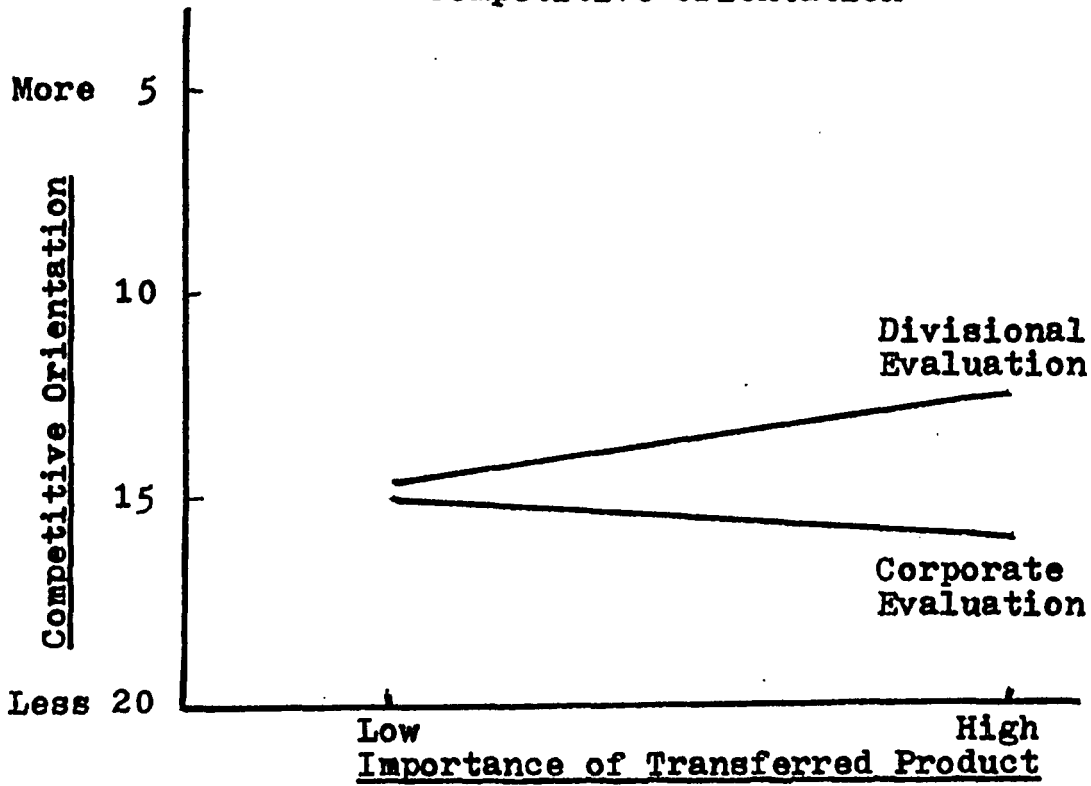


Figure 9
Interaction Effect -
Competitive Orientation



evaluation was based on divisional performance, all of the aforementioned directions were reversed. Thus, any differences due to the importance main effects must be considered in terms of the basis for evaluation.

The experimental hypotheses can now be examined:

Hypothesis A stated:

The more an evaluation/reward system is based on sub-unit profits (as opposed to corporate profits), the greater the development of a competitive (less cooperative) orientation during the transfer price determination.

This hypothesis was confirmed by virtue of the high significance of the evaluation main effect on the attitude, cooperation and competition variables. At both levels of importance of the transferred product, those subjects who were evaluated on the basis of divisional performance developed considerably less favorable attitudes toward the other division who were evaluated on the basis of corporate performance (see Figure 7). As noted by Walton, Dutton and Fitch (1966), a competitive (distributive) approach to joint problem solving tends to promote less favorable interparty attitudes, whereas a cooperative (integrative) approach tends to promote more favorable attitudes.

Further confirmation of this hypothesis can be found from a consideration of the measured orientations to conflict resolution. Although this questionnaire was phrased in terms of resolution of future disagreements, it is reasonable to conclude that future orientations would be

based on past interparty experiences. Therefore, the data presented in Figures 8 and 9 are also relevant. These show that those subjects who were evaluated on the basis of divisional performance developed a less cooperative and more competitive orientation toward conflict resolution than did those evaluated on the basis of corporate performance. These differences held for both levels of the importance of the transferred product, although, due to the interaction, the effect was more pronounced at high levels of importance.

The compromising orientation was not significantly different for the different treatments, presumably because all subjects perceived compromise to be relevant to their situation; some compromise could be consistent with both the cooperative and competitive approaches.

Because of the highly significant interaction and because the scores were actually ranked measures, rather than interval measures, these findings are subject to qualifications. They are dependent on the measuring scale itself. However, because of the highly significant findings, confirmed by more than one scale, this hypothesis is considered to be confirmed within the range of variable tested.

Hypothesis B stated:

The more important the transferred product is to the profit potential of each of the sub-units, the greater the competitive orientation (and the less the cooperative orientation) developed during transfer price determination.

This hypothesis cannot be accepted because of the interaction effect. Figures 7-9 all show a crossover of the attitude and orientation differences. Only when subjects were evaluated on the basis of divisional performance could this hypothesis be accepted. Under these circumstances, the groups for which the transferred product was important did develop a more competitive (and less cooperative) orientation. However, when they were evaluated on the basis of corporate performance, the effect was reversed.

As noted previously, these findings might also depend on the choice of measurement scales.

Hypothesis C stated:

The greater the awareness of the sub-units of the existence of an outside market price for the transferred product, the less the development of a competitive orientation during transfer price determination.

This hypothesis could be neither accepted nor rejected, since the market price manipulation was unsuccessful.

Hypothesis D stated:

1. The more aggressive, competitive behavior that occurs during the transfer pricing process, the less cooperative the subsequent relationships between the sub-units.
2. The more problem solving that occurs during the transfer pricing process, the more cooperative the subsequent relationships between the sub-units.

It was intended that this hypothesis be tested through the use of the post-decision cooperation scale, as measured by responses to hypothetical incidents. However, as noted, this scale was not useful.

Instead, this hypothesis was tested, indirectly, through an observation of the type of behavioral interaction exhibited by the subjects during the decision making exercise.¹ (This assumes that behavior exhibited during the exercise will be extended to subsequent relationships.) During the second and third decision periods, the subjects were observed in order to determine whether or not the members of the two divisions of the same company cooperated in making the SOLVENT/LATEX decisions even though they did not need to, nor were they requested to do so. Table 13 presents the data in the form of a 2X2X2 contingency table.

One very distinct main effect can be discerned. When the groups were evaluated on the basis of divisional performance, twelve of the thirteen companies showed no cooperative interaction at all during the last two decision periods. On the other hand, all of the thirteen companies that were evaluated on the basis of corporate performance demonstrated at least one instance of cooperative behavior.

The Fisher exact probability test was used to test the evaluation effect. For the condition in which the

¹It must be recognized that there is a distinct possibility that an observer bias was present, since only the researcher made these observations and he was generally aware of the experimental conditions under which each group was operating. However, this is not considered to be a major problem since it was not the only measure of cooperative orientation used in this research. The other measures were not subject to possible observer bias.

TABLE 13

COOPERATIVE INTERACTIONS DURING
DECISION MAKING EXERCISES¹

	BASIS FOR EVALUATION			
	DIVISIONAL PERFORMANCE		CORPORATE PERFORMANCE	
	No Cooperative Interactions	At Least One Cooperative Interaction	No Cooperative Interactions	At Least One Cooperative Interaction
TRANSFERRED PRODUCT IMPORTANT	7	0	0	7
TRANSFERRED PRODUCT NOT IMPORTANT	5	1	0	6

¹Entries indicate the frequency that companies showed evidence of at least one cooperative interaction during last two decision periods.

transferred product was important, $p=0.0003$, and for the condition in which the transferred product was not important, $p=0.0076$. Thus the evaluation effect was highly significant.

The effect of the importance of the transferred product is less distinct. The most evidence of cooperative interaction occurred when the transferred product was important, but this difference was not significant. (The Fisher exact probability was 0.46, under the condition of divisional performance evaluation and 1.0 for corporate performance evaluation.)

The interaction effect noted previously was not observed. A possible reason for this will be given below.

Hypothesis D cannot be accepted on the basis of observed behavior during the decision making exercise. With divisional performance evaluation, negative attitudes and competitive orientation did develop and cooperative behavior did not occur. Further, with corporate evaluation, positive attitudes and cooperative orientation develop, accompanied by cooperative behavior. However, the most negative attitude and the most competitive orientation was developed when the divisional performance evaluation was combined with an important transferred product. This was hypothesized to result in the least cooperative behavior. Although this combination of variables did result in the most competitive behavior, it was not significantly different ($p=0.46$) from the less competitively

oriented attitude developed through a combination of a divisional evaluation system and transferred product not important. The most positive attitude and the most cooperative orientation was developed when the corporate performance evaluation was combined with an important transferred product. This was hypothesized to result in the most competitive behavior. However, the observed behavior was not significantly different than that observed under conditions that resulted in a reduced cooperative orientation.

This lack of an interaction effect can be explained. Behavior exhibited during the decision making exercise was task related. When the divisions were evaluated on the basis of corporate performance, the only way they could achieve the objective of higher profits was through cooperation with the other division, whether or not the transferred product was important. In fact, when the transferred product was not important, the best way of achieving the goal of increased corporate profits was by interacting with the other division in the course of making the SOLVENTS/LATEX decisions, since these products offered the greater profit potential.

The conflict resolution questionnaire, on the other hand, is neither behavioral nor task related; it is attitudinal. It provides an indication of how the parties are likely to behave in the face of future disagreements. Thus, there is some justification for using it to test hypothesis D. The most negative attitudes toward the

other division (derived from divisional performance and an important transferred product) did match the most competitive (least cooperative) orientation toward future conflict resolution. The most cooperative orientation toward the future resolution of conflicts with the other division developed at the same time as positive attitudes toward the other division. This would seem to support the hypothesis. However, since the scale is attitudinal rather than behavioral, this confirmation is no more than a reaffirmation of prior hypothesis testing conclusions.

In summary, then, hypothesis D can only be partially accepted.

Miscellaneous Observations and Findings

In addition to the observation of differences in the degree of cooperation during the actual decision making process, other patterns were observed which show further manifestations of behavioral differences due to manipulation of the independent variables.

For instance, it was observed that those teams which were being evaluated on the basis of corporate performance and for which the transferred product was important, tended to sit near each other during the later periods of the decision making exercises, even before the exercise actually began. This was particularly noticeable in the third (and final) period. Those groups which were evaluated on the basis of divisional performance and for which the transferred product was important tended to sit apart

from one another, and during transfer price determination sat facing one another, rather than in a random manner. Further, the latter groups did not seem to share cost-volume information with their sister divisions, whereas the former group did so as part of their cooperative interaction. On a number of occasions, the uncooperating teams got into arguments as to which division would physically move to where the other division was sitting. A few of these arguments lasted for a minute or two.

No data were collected in relation to these observations and they must be considered to be anecdotal only, but they do add a measure of confidence to the validity of the measures and to the statistically tested findings previously discussed.

Since the output of the decision making exercise consisted of profit data, it was thought that there might be some differences in the levels of profits under the different treatments. Although not specifically hypothesized prior to the experimental work, it was hoped that higher profits would be congruent with more cooperative attitudes and behavior.

ANOVA would not be meaningful for this analysis, since by the nature of the simulation the absolute levels of profits are dependent on whether or not the transferred product is important, independent of any behavioral differences. Therefore, the data were dichotomized into the two levels of the importance of the transferred product, and

only the basis for evaluation could be tested. Since the data result from only eleven to thirteen combined observations in each category, and profit data did not appear to be normally distributed, the non-parametric Mann-Whitney U Test was used to test the difference in central tendency for each pair of profits and for each level of importance of the transferred product.

The mean company profits under the condition in which the transferred product is important are shown in Table 14. Three different profits are shown--profits only from transferred products and profits only from non-transferred products and total profits. The groups had most control over the transferred product profits, since there were no outside influences from other companies in competition with them. It was thought that this would have the best chance of demonstrating significant differences.

A number of interesting observations can be made concerning these means. In Table 14, all of the mean differences are in the right direction, i.e., higher profits under a corporate evaluation system that promoted cooperative behavior than under a divisional evaluation system that promoted competition. Subjects in the corporate evaluation situation would be more likely to search for an overall optimum solution, rather than try to maximize their own divisional profits to the detriment of corporate profits. However, none of the differences were significantly different at the 0.05 level, although the difference for transferred products only, was marginally significant. The

TABLE 14

COMPANY PROFITS¹ FOR LAST TWO DECISION
PERIODS - TRANSFERRED PRODUCTS
IMPORTANT

<u>BASIS FOR EVALUATION</u>			
<u>BASIS FOR PROFITS CALCULATION</u>	<u>DIVISIONAL PERFORMANCE</u> n=13	<u>CORPORATE PERFORMANCE</u> n=11	<u>MANN-WHITNEY U TEST SIGNIFICANCE</u> ²
TRANSFERRED PRODUCTS ONLY (MONOMER + RESIN)	\$109.3	\$127.8	p<0.076
NON-TRANSFERRED PRODUCTS ONLY (SOLVENTS + LATEX)	\$21.3	\$22.2	p<0.33
TOTAL PROFITS - ALL PRODUCTS	\$130.6	\$150.0	p<0.20

¹In thousands of dollars

²Adjusted for ties

combination of small sample size and wide variation in results prevented such significant inferences from being made.

The data for the condition in which the transferred product was not important are shown in Table 15. Again, the differences are in the right direction, although the difference for transferred product only was very small. In no cases were any of the differences significant.

Thus, although not hypothesized and not significant, there seems to be a trend toward higher profits when the groups were evaluated on a corporate, rather than divisional level, a condition which has been observed to promote cooperative behavior.

TABLE 15

COMPANY PROFITS¹ FOR LAST TWO DECISION
PERIODS - TRANSFERRED PRODUCTS
NOT IMPORTANT

<u>BASIS FOR EVALUATION</u>			
<u>BASIS FOR PROFITS CALCULATIONS</u>	<u>DIVISIONAL PERFORMANCE</u> n=13	<u>CORPORATE PERFORMANCE</u> n=12	<u>MANN-WHITNEY U TEST SIGNIFICANCE</u> ²
TRANSFERRED PRODUCTS ONLY (MONOMER + RESIN)	\$13.0	\$13.2	p 0.37
NON-TRANSFERRED PRODUCTS ONLY (SOLVENTS + LATEX)	\$221.6	\$268.6	p 0.19
TOTAL PROFITS - ALL PRODUCTS	\$234.6	\$281.8	p 0.21

¹In thousands of dollars

²Adjusted for ties

CHAPTER V

SUMMARY AND RECOMMENDATIONS

Although not all of the hypotheses have been confirmed, this research has shown that the transfer pricing process can be viewed in terms of a conflict process. Depending on the guidelines under which the price determination is achieved, the behavioral consequences can be dysfunctional competition resulting in a win-lose orientation, or it can be one of joint problem solving with a functional aftermath.

The research would appear to lend credence to those conflict models (Pondy, 1967; Walton and Dutton, 1969) which emphasize the episodic, dynamic nature of conflict and the importance of considering the nature of its aftermath. In other words, attitudes developed during the conflict process were manifested in either functional or dysfunctional (to the organization) behavior. Thus, favorable attitudes among members of the same teams resulted in an increased orientation toward cooperative behavior. Although the profits of the teams that exhibited such cooperative behavior were not significantly different than the profits of those teams which developed a pressuring orientation, the fact is that all of the six measured profit differences (of which four were independent

measures) were in the right direction and one of the differences, for profits derived entirely from transferred products, was very nearly significant. This provides some measure of assurance to the statement that cooperative behavior was translated into desirable outcomes.

In looking at the impact of this research on the design and management of transfer pricing systems, it would appear that a situational approach would be reasonable, even though these findings are rather limited in scope and subject to some previously mentioned qualifications. The basis for executive evaluation seems to be a major determinant in whether or not the system would have negative behavioral consequences. An evaluation system based on corporate performance is not likely to be harmful to ongoing, necessary divisional relationships, whether the transferred product is important or not. However, if the product is important to both parties, it would appear to be vital to set up an evaluation/reward system such that at least some meaningful portion of an executive's compensation would be dependent on combined profits. In some cases, individual profit center evaluation will still be considered important, notwithstanding its possible negative consequences. A possible alternative could be to buffer the impact, on the profit center, of a decision favorable to the combined profits, but detrimental to a particular profit center. This might be accomplished by adjusting that division's profits, for

evaluation purposes only, by this difference in profits. This could result in superior corporate decisions, yet maintain some semblance of profit center responsibility and autonomy. However, a possibly negative consequence of such a plan could be bickering over the adjustments and increased paper work.

For the situation in which the transferred product was not important to either division, the research results suggest that a corporate evaluation system is less vital, but still desirable.

This research looked at only a very narrow aspect of the transfer pricing problem. It was not able to determine the effect of the absence or presence of a market price for the transferred product. It considered only the situation in which the two parties actually engaged in face to face negotiations, with no allowable appeal or third party intervention. In some industrial situations, this would not be the case--transfer prices could be assigned by third parties (or computers) and thus executives would not be given the opportunity to participate in the decision. In industrial situations, decisions can usually be appealed or "kicked upstairs", but not so in this experiment. In those cases where agreement on price and quantity was difficult to achieve, almost all of the subjects preferred to agree to something, which gave them some profits, rather than to walk away and have no profit at all. This is particularly relevant to the situation in

which the transferred product was important and evaluation was on divisional performance. Here also, there was little opportunity to compensate for decreased profits in one product area by increases in another. Nor, could they go to others for help or support. In short, they had little alternative, but to do the best they could. This tended to create time pressures, since only a specified amount of time was allotted to the decision.

As pointed out by Yukl, et al (1976), such time pressure inhibits problem solving. This could affect the resulting orientations of the parties by promoting more of a competitive orientation than if the time pressure did not exist. These researchers also pointed out that the order of settlement is a factor to be considered. They found that in integrative bargaining, sequential settlement was less desirable in terms of joint payoff, than either a package settlement or an unrestricted settlement. In this research, the approach used by most of those subjects who were engaged in integrative bargaining seemed to be sequential. If this were so, it could have had an adverse effect on joint profits, thereby limiting the favorable results of the integrative approach. Observations of the behavior of these groups showed that they worked first on one aspect of the decision and then the second. However, no hard data were collected, so that no real conclusions can be drawn.

A potentially useful result of this research effort

is the beginning of the development of a conflict resolution scale. Much remains to be done to develop a reliable, valid instrument. The sub-scale that measures orientation toward a cooperative mode of conflict resolution seems to be reliable and valid, at least in terms of the requirements of this research. As noted, the student subjects equated smoothing with problem solving and hence both of these conceptually different modes of conflict resolution loaded on a single factor. This might be different in an industrial setting with experienced, rather than naive, subjects.

The sub-scale that measures the competitive orientation was likewise affected by the perceptions of the student subjects, who considered forcing to be equivalent to persuasion. Further, the problem of poor reliability of this sub-scale must be overcome.

The bargaining sub-scale had completely unacceptable reliability, possibly because it was not relevant to the situation. This problem might be overcome simply by using more experienced subjects.

All scales would be helped by more items.

In summary, a beginning has been made, but much remains to be done to develop a meaningful and useful conflict resolution scale. Such development would probably entail the addition of new items, the deletion of some and the rephrasing of others. Item phrasing would seem to be very sensitive to the particular use to which

the instrument would be put, and a universally adaptable conflict resolution scale might not be feasible.

It can be seen that this research effort has only scratched the surface of the problem of the behavioral consequences of transfer pricing. The rest of this discussion will be concerned with the direction of future research and the nature of the work that should be undertaken.

The first order of business would seem to be the refinement of the conflict resolution scales. A reliable and valid scale is a prerequisite to any meaningful research. The Survey Research Center at the University of Michigan is currently working on this problem, but have apparently not yet developed a useful scale.

The major deficiency of this research is believed to be the lack of proof of external validity of its findings. Therefore, the findings should be confirmed via field survey work. A beginning has been made in this direction. A few companies have already cooperated and some responses (too few to be analyzed) are in hand. This work will be continued by this researcher in an attempt to provide some of the needed validation. The problem has been, and will likely continue to be, getting sufficient numbers of responses per treatment to get the needed replication. This will be particularly difficult to accomplish if the companies are chosen so that they are in similar industrial environment. If the contingency approach to transfer

pricing is accepted, then without this selection procedure, the data could be confounded by the uncontrolled environmental and organizational factors.

A field study such as this, using the same conflict resolution questionnaire used in the experimental phase could provide an opportunity to check the usefulness of the existing conflict resolution instrument in an industrial culture and give some guidance as to how it should be modified.

Since industrial transfer pricing seems to involve third party interventions and a loss of some divisional autonomy, these two factors should also be considered as independent variables in future experiments of this kind. Other variables that should be investigated are the possible effect of assymetries in the importance of the transferred product and a new effort to test the market price variable. The field work that had been done so far, indicated that transfer pricing under market price circumstances is prevalent.

Finally, the entire concept of a contingency approach to transfer pricing should be a fertile area for research. It had been hypothesized that stable environments and mechanistic organizations might eliminate the necessity for face to face transfer price procedures, substituting formal procedures, and evaluating the sub-units on the basis of costs or other controllable factors. Any transfer prices needed for capital budgeting or other resource allocations

could be done by third parties, possibly the Controller's Department.

Organic organizations in an uncertain environment might be more likely to benefit from a transfer pricing system that is based on an open exchange of information, with evaluation based, at least partly, on some combined profit. This would best be tested through a field approach, but again, the problem would likely be in getting the cooperation of sufficient firms operating in different environments, yet permitting some control of the relevant variables.

An alternative approach would be an in-depth analysis of a limited number of organizations in different environments. Perhaps this would be easier to arrange than a survey. The results of the experimental study might be the catalyst needed to secure the cooperation of a few firms.

Thus, the results of this research seem to provide more ideas for future research than answers, and the results themselves must be considered to be tentative. Some of the dependent variable scales need improvement, the effect of market price was not tested, some of the assumptions underlying the statistical procedures were not met and the findings must be externally validated. Nevertheless, the basic premise of the research has been achieved. The transfer pricing process can be viewed in terms of a conflict process, and it must be designed and

managed in terms of its possible behavioral consequences.

APPENDIX

APPENDIX A

SIMULATION MODEL

This section describes in detail the simulation model used in the experimental phase of the research. First, the mathematical model will be described. This will be followed by a description of the computer program used and an example of a typical computer printout distributed to the students following each decision. The detailed instructions given to each student is presented in Appendix B. These show how each of the three dependent variables was manipulated.

I. Mathematical Model

a. General

The simulation can be divided into two separate and independent decisions. One of the decisions was similar to the typical, although here much simplified, business game used in many colleges and universities. It placed each division of each company (team) in competition with others for sales in a specific industry. The product produced and sold by the Chemicals Division was called SOLVENTS; the Plastic Division's product was called LATEX. The model for each of these two products was identical in every respect, except for labeling differences in the

computer printout. Model parameters were altered in order to manipulate one of the independent variables; namely, whether or not the transferred product was important to the division in terms of potential profits to be derived from that product.

The second decision concerned the transferred product. The Chemical Division of each company produced a product called MONOMER, which was sold only to the Plastics Division of the same company, who converted it all to a product called RESIN. No outside sales were allowed. This model was much simpler than the first, since the divisions did not make any marketing decisions and were not in competition with the respective divisions in the other companies.

b. SOLVENTS (LATEX) Model

This model will be described in terms of SOLVENTS and for the experimental condition in which the transferred product was important to the divisions' profit potential. The parameter changes to alter this experimental condition will then be noted. As mentioned previously, the model is identical for SOLVENTS and LATEX. The basis is one month of operation.

Each division was given an initial inventory of 50,000 pounds of SOLVENT (slightly over one month's inventory), valued at 30 cents per pound. The students were told that SOLVENTS had been selling at 50 cents per

pound and that the division had been spending \$5,000 per month for marketing expenses. Each division had cash on hand of \$100,000.

The monthly SOLVENT decisions to be made were:

- a. Price charged
- b. Marketing expenses
- c. Production level; plant capacity was fixed for the duration of the simulation (three decisions)

The following nomenclature will be used to describe the model:

(I) = division number

N = number of divisions

M1(I) = previous period marketing costs

M2(I) = current period marketing costs

M3 = a marketing function for the entire industry

E(I) = effective marketing of the division

P(I) = price charged

P1 = average industry price

P2 = a price function for the industry

F(I) = market share function

O(I) = orders received by the division

O1 = total industry orders

L(I) = sales

Q(I) = production level

C(I) = cost of production at Q(I), from supplied graphs

U(I) = unit cost of production, from supplied graphs,

$$\text{or } U(I) = \frac{C(I)}{Q(I)}$$

- $Y(I)$ = inventory level, beginning of period
 $I1(I)$ = ending inventory
 $V1(I)$ = value of beginning inventory
 $V(I)$ = value of ending inventory
 $S(I)$ = unit value of ending inventory
 $S4(I)$ = unit value of beginning inventory
 $G(I)$ = cost of goods sold
 $R(I)$ = sales revenue
 $T(I)$ = profits before tax

Orders Received

$$\text{Effective marketing} = E(I) = 0.75M2(I) + 0.25M1(I)$$

$$\text{Marketing function} = M3 = 3 - \frac{60}{\sum_{I=1}^N E(I)}$$

$$\text{Price function} = P2 = \frac{0.50}{\text{average of two lowest price}}$$

$$\text{Average Price} = P1 = \frac{\sum_{I=1}^N P(I)}{N}$$

$$\text{Total industry orders} = O1 = (N)(40)(M3)(P2)$$

$$\begin{aligned} \text{Division's market share function} &= F(I) \\ &= \left[\frac{P1}{P(I)} - 0.8 \right] \left[\frac{E(I)}{\sum_{I=1}^N E(I)} \right] \end{aligned}$$

$$\text{If } \frac{P1}{P(I)} \leq 0.8, \text{ then } F(I) = 0$$

$$\text{Orders received by division} = O(I) = O1 \left[\begin{array}{c} F(I) \\ N \\ F(I) \\ I=1 \end{array} \right]$$

Divisional Sales

- (i) If $O(I) \leq [Q(I) + Y(I)]$, then sales = $L(I) = O(I)$
- (ii) If $O(I) > [Q(I) + Y(I)]$, then $L(I) = Q(I) + O(I)$

Inventory Valuation

$$\text{Ending inventory} = I1(I) = Q(I) + Y(I) - L(I)$$

- (i) If $O(I) > [Q(I) + Y(I)]$, then $V(I) = 0$
- (ii) If $[Q(I) + Y(I)] > O(I) \geq Y(I)$,
then $V(I) = [Q(I) + Y(I) - O(I)] [U(I)]$
- (iii) If $[Q(I) + Y(I)] \geq O(I) < Y(I)$,
then $V(I) = [Y(I) - O(I)] [S4(I)] + C(I)$

$$S(I) = \frac{V(I)}{I1(I)}$$

Cost of Goods Sold

- (i) If $[Q(I) + Y(I)] > L(I) > Y(I)$,
then $G(I) = V1(I) + [L(I) - Y(I)] [U(I)]$
- (ii) If $L(I) \leq Y(I)$,
then $G(I) = [L(I)] [S4(I)]$
- (iii) If $L(I) = Q(I) + Y(I)$,
then $G(I) = V1(I) + C(I)$

Profits

$$\text{Sales revenue: } R(I) = [L(I)] [P(I)]$$

$$\text{Profits: } T(I) = R(I) - G(I) - M2(I)$$

Independent Variable Manipulation

For the experimental condition that simulates the situation in which the transferred product was not important, the following changes were made:

- Initial inventory = 500,000 pounds
- Previous marketing expense = \$50,000 per month
- The ordinates of the SOLVENTS (LATEX) cost-volume graphs were multiplied by a factor of ten
- Marketing function = $M3 = 3 - \frac{500}{\sum_{I=1}^N E(I)}$
- Total industry orders = $O1 = (N)(400)(M3)(P2)$

These changes increased the profit potential derived from SOLVENTS or LATEX by a factor of ten.

c. MONOMER (RESIN) Model

For this decision, the model is considerably simplified, since there was no inter-company competition. Rather, the two divisions had to meet and jointly decide on the quantity and price of the MONOMER transferred from the Chemicals Division to the Plastics Division. The latter then incurred expenses to convert MONOMER to RESIN for subsequent sale to the outside.

The instructions indicated that RESIN sales were limited only by the ability and desire of the Chemicals Division to supply MONOMER. The RESIN market price was fixed at 30 cents per pound; marketing expenses were assumed to be included in the total costs data provided. No MONOMER or RESIN inventory was to be maintained.

The following nomenclature will be used to describe the model:

P1(I) = price of MONOMER
Q1(I) = quantity of MONOMER (or RESIN)
C1(I) = total costs of MONOMER (or RESIN),
from supplied graphs
R1(I) = sales revenue
T1(I) = profit, before tax

It was assumed that one pound of MONOMER produces one pound of RESIN.

For Chemicals Division

$$\begin{aligned} R1(I) &= [P1(I)] [Q1(I)] \\ T1(I) &= R1(I) - C1(I) \end{aligned}$$

For Plastics Division

$$\begin{aligned} \text{Net Revenue} &= R1(I) = [0.30 - P1(I)] [Q1(I)] \\ \text{Profits} &= T1(I) = R1(I) - C1(I) \end{aligned}$$

For the experimental condition that simulated the condition where the transferred product was not important, the ordinates of the cost-volume graphs for both MONOMER and RESIN were reduced by a factor of ten. This decreased the profit potential derived from SOLVENTS or RESIN by a factor of ten.

d. Combined Performance

The profits derived from both SOLVENTS and MONOMER (or LATEX and RESIN) were combined to give total divisional profits before tax. Taxes were assumed to be 50%. After-tax profits were added to cash on hand to give a final cash balance.

$$\begin{aligned} \text{Total divisional profit, before tax} &= X1(I) \\ &= T(I) + T1(I) \end{aligned}$$

$$\begin{aligned} \text{Total divisional profit, after tax} &= A1(I) \\ &= 0.50 [X1(I)] \end{aligned}$$

$$\text{Cash on hand, end of period} = H(I) = H(I) + A1(I)$$

II. Computer Program and Printout

The computer program was written in extended basic and run on a time shared Data General Eclipse S200 Computer, with 96 K of storage.

Four different programs were required for each simulation run. Two programs were used for each of the divisions - one for the situation in which the transferred product was important and one for the situation in which the transferred product was not important.

Only one of these programs is attached, since all four are essentially the same. The only differences were in the printout for the two divisions and the values of the parameters. The specific program shown was used for the Chemicals Division, covering the situation in which the transferred product was not important. A typical printout for this condition is illustrated immediately following the listing of the computer program.

SAINT PETER'S

```
0010 OPEN FILE[2,1], "$LPT"
0020 REM PROGRAM SAVED UNDER GAMEB. CH
0030 REM PROGRAM FOR BOB ACKELSBERG BY ALEC CALIANE
0040 REM INPUT DATA
0050 DIM M1[10], M2[10], P[10], Q[10], C[10], E[10], F[10]
0060 DIM O[10], U[10], K[10], S[10], R[10]
0070 DIM C[10], T[10], Y[10], W[10]
0080 DIM V[10], G[10], A[10]
0090 DIM L[10], I[10], S4[10], V1[10]
0100 REM VARIABLES FR MONOMER CALCULATIONS
0110 DIM P1[10], Q1[10], C1[10], R1[10], T1[10], X1[10],
0120 DIM H[10], H1[10]
0130 PRINT "THE FOLLOWING INPUT IS FOR THE INITIAL
0140 PRINT "OR IF THE DATA FROM THE PREVIOUS PERIOD
0150 PRINT
0160 INPUT "INPUT CURRENT DECISION PERIOD HERE >>>>:"
0170 INPUT "PUT IN THE NUMBER OF TEAMS HERE >>>>>>"
0180 FOR I=1 TO N
0190   PRINT "INPUT TEAM "; I; "'S PREV MARKET COST,
0200   INPUT M1[I], Y[I], S4[I]
0210   PRINT "INPUT THE PREV VAL OF INV, PREVIOUS CA
0220   INPUT V1[I], H1[I]
0230 NEXT I
0240 CLOSE
0250 OPEN FILE[2,1], "$LPT"
0260 FOR I=1 TO N
0270   PRINT "FOR SOLVENTS: INPUT TEAM "; I; "'S MKT C
0280   INPUT M2[I], P[I], Q[I], C[I]
0290   PRINT "FOR MONOMER: INPUT TEAM "; I; "'S PRICE,
0300   INPUT P1[I], Q1[I], C1[I]
0310 NEXT I
0320 REM
0330 FOR I=1 TO N
0340   LET E[I]=.75*M2[I]+.25*M1[I]
0350 NEXT I
0360 REM SMALL SUM ROUTINE
0370 LET S1=0
0380 LET S2=0
0390 LET S3=0
0400 FOR I=1 TO N
0410   LET S1=S1+E[I]
0420   LET S2=S2+P[I]
0430   LET S3=S3+M2[I]
0440 NEXT I
0450 LET M3=3-(600/S1)
0460 LET Z1=S2/N
0470 REM SEARCH FOR THE TWO LOWEST PRICES
0480 FOR I=1 TO N
0490   LET W[I]=P[I]
0500 NEXT I
0510 FOR I=1 TO 2
```



```

0520   FOR J=1 TO N-1
0530     IF W[J]<=W[J+1] THEN GOTO 0550
0540     GOTO 0580
0550     LET Z=W[J]
0560     LET W[J]=W[J+1]
0570     LET W[J+1]=Z
0580   NEXT J
0590 NEXT I
0600 LET P2=.5/((W[N]+W[N-1])/2)
0610 LET Q1=N*400*P2*M3
0620 REM CALCULATION OF MARKET SHARE FUNCTION
0630 LET T1=0
0640 FOR I=1 TO N
0650   LET F[I]=(Z1/P[I]-S)*M2[I]/SG
0660   IF (Z1/P[I])<.8 THEN LET F[I]=0
0670   LET T1=T1+F[I]
0680 NEXT I
0690 FOR I=1 TO N
0700   LET U[I]=C[I]/Q[I]
0710   LET O[I]=Q1*(F[I]/T1)
0720 NEXT I
0730 FOR I=1 TO N
0740   IF O[I]<=(Q[I]+Y[I]) THEN GOTO 0770
0750   LET L[I]=Q[I]+Y[I]
0760   GOTO 0780
0770   LET L[I]=O[I]
0780 NEXT I
0790 FOR I=1 TO N
0800   LET I1[I]=Y[I]+Q[I]-L[I]
0810   REM COMPUTE VALUE OF INVENTORY
0820   REM: : DRC... I THINK YOU ARE MISSING A NEXT I :
0830   REM: : HERE SO I PUT ONE IN JUST FOR NOW.
0840 NEXT I
0850 FOR I=1 TO N
0860   IF O[I]>Y[I]+Q[I] THEN GOTO 0900
0870   IF (Y[I]+Q[I])>O[I] THEN IF O[I]>=Y[I] THEN (
0880   LET V[I]=(Y[I]-O[I])*S4[I]+C[I]
0890   GOTO 0930
0900   LET V[I]=0
0910   GOTO 0930
0920   LET V[I]=(Q[I]+Y[I]-O[I])*U[I]
0930 NEXT I
0940 FOR I=1 TO N
0950   IF I1[I]=0 THEN GOTO 0990
0960   LET S[I]=V[I]/I1[I]
0970   LET R[I]=L[I]*P[I]
0980   GOTO 1020
0990   PRINT FILE[2], "ENDING INV = 0, CANNOT COMPUTE
1000   LET S[I]=0
1010   GOTO 0970
1020 NEXT I
1030 FOR J=1 TO N
1040   IF L[J]<Y[J] THEN GOTO 1080
1050   IF L[J]=(Y[J]+Q[J]) THEN GOTO 1100

```

GOTO 0550

SHARE FUNCTION

ENTER'S COSTS - COMPUT

GOTO 0770

NTORY
E MISSING A NEXT I STATEMENT
N JUST FOR NOW.

GOTO 0900
IF 0[I] >= Y[I] THEN GOTO 0920
I+C[I]

*U[I]

= 0, CANNOT COMPUTE INV UNIT COST , SETTING@IT@TO@PBMMMMMMMMMMMMMMMM

IO
GOTO 1100

```

1060 LET G[I]=V1[I]+(L[I]-Y[I])*U[I]
1070 GOTO 1110
1080 LET G[I]=L[I]*S4[I]
1090 GOTO 1110
1100 LET G[I]=V1[I]+C[I]
1110 NEXT I
1120 REM PROFIT COMPUTATION
1130 FOR I=1 TO N
1140 LET T[I]=R[I]-G[I]-M2[I]
1150 NEXT I
1160 REM MONOMER CALCULTIONS
1170 FOR I=1 TO N
1180 LET R1[I]=P1[I]*Q1[I]
1190 LET T1[I]=R1[I]-C1[I]
1200 LET X1[I]=T1[I]+T[I]
1210 LET A1[I]=.5*X1[I]
1220 LET H1[I]=H1[I]+A1[I]
1230 NEXT I
1240 LET L9=0
1250 FOR I=1 TO N
1260 LET L9=L9+L[I]
1270 NEXT I
1280 GOTO 1330
1290 REM REPORT ROUTINE
1300 LET N9=N9-1
1310 OPEN FILE(2,1) "$LPT"
1320 PRINT FILE(2) "<12>"
1330 FOR I=1 TO N
1340 PRINT FILE(2) "<12>"
1350 PRINT FILE(2) "<14>REPORT FOR TEAM "; I; "
1360 PRINT FILE(2) " "
1370 PRINT FILE(2)
1380 PRINT FILE(2) "<14> CHEMICALS 1
1390 PRINT FILE(2) " "
1400 PRINT FILE(2) "SOLVENT REPORT FOR ALL TEAMS
1410 PRINT FILE(2) " "
1420 PRINT FILE(2) " PRICE, $ PER LB. "
1430 FOR J=1 TO N
1440 PRINT FILE(2) "TEAM "; J; " "; P1[J]
1450 NEXT J
1460 PRINT FILE(2)
1470 LET O1=O1*1000
1480 PRINT FILE(2) "TOTAL ORDERS FOR ALL TEAMS :
1490 PRINT FILE(2) USING "###,###,###.##", O1; " L
1500 LET O1=O1/1000
1510 LET L9=1000*L9
1520 PRINT FILE(2) "TOTAL SALES FOR ALL TEAMS >>
1530 PRINT FILE(2) USING "###,###,###.##", L9; " L
1540 LET L9=L9/1000
1550 PRINT FILE(2)
1560 PRINT FILE(2)
1570 PRINT FILE(2) " SOLVENTS REPORT FOR T
1580 PRINT FILE(2) " "

```

SAINT PETER'S

-Y(IJ)*UCIJ

Z(IJ)

S

J

J

PETER'S COLLEGE COMPUT

REPORT FOR TEAM "; I; " <14>PERIOD "; N9

CHEMICALS DIVISION"

NT REPORT FOR ALL TEAMS"

PRICE, \$ PER L.B. "

M "; J; " "; P(IJ)

ORDERS FOR ALL TEAMS >>>>>> ";
"###, ###, ###. ##", 01; " LBS. "

SALES FOR ALL TEAMS >>>>>> ";
"###, ###, ###. ##", L9; " LBS. "

SOLVENTS REPORT FOR TEAM"; I


```
2160 PRINT FILE[2], " "
2170 PRINT FILE[2], " "
2180 LET X1[I]=1000*X1[I]
2190 PRINT FILE[2], " TOTAL DIVISIONAL PROFIT
2200 PRINT FILE[2], USING "###,###.##", X1[I]
2210 LET X1[I]=X1[I]/1000
2220 LET A1[I]=1000*A1[I]
2230 PRINT FILE[2]
2240 PRINT FILE[2], " AFTER
2250 PRINT FILE[2], USING "###,###.##", A1[I]
2260 LET A1[I]=A1[I]/1000
2270 PRINT FILE[2],
2280 LET H1[I]=1000*H1[I]
2290 PRINT FILE[2], "
2300 PRINT FILE[2], USING "###,###.##", H1[I]
2310 LET H1[I]=H1[I]/1000
2320 PRINT FILE[2], " "
2330 PRINT FILE[2], " "
2340 PRINT FILE[2], " "
2350 PRINT FILE[2], " "
2360 PRINT FILE[2], " "
2370 NEXT I
2380 REM SAVE ROUTINE AND INITIALIZE FOR NEXT PERIOD
2390 FOR I=1 TO N
2400 LET Y[I]=I1[I]
2410 LET S4[I]=S[I]
2420 LET V1[I]=V[I]
2430 LET H1[I]=H[I]
2440 LET M1[I]=M2[I]
2450 NEXT I
2460 LET N9=N9+1
2470 CLOSE
2480 SAVE "GAMES. CH"
```

AL DIVISIONAL PROFIT BEFORE TAX"; " \$ ";
###. ##", X1[I]

AFTER TAX PROFIT"; " \$ ";
###. ##", A1[I]

CASH ON HAND"; " \$ ";
###. ##", H[I]

SIZE FOR NEXT PERIOD

APPENDIX B

INSTRUCTIONS DISTRIBUTED TO STUDENTS

The 2x2x2 experimental design resulted in eight different experimental conditions, each requiring a different set of instructions. Since each division required its own instructions, a total of sixteen sets of instructions were needed. For simplicity, only two instructions are attached. In the first, for Chemicals Division, the experimental conditions were as follows:

1. There was a market price for the transferred product.
2. The transferred product was important to the division's profit potential.
3. The divisional executives were evaluated and rewarded primarily on the basis of divisional profits

In the second set of instructions, for the Plastics Division, the opposite experimental conditions were in effect:

1. There was no market price for the transferred product
2. The transferred product was not important to the division's profit potential
3. The divisional executives were evaluated and rewarded primarily on the basis of company (rather than divisional) profits

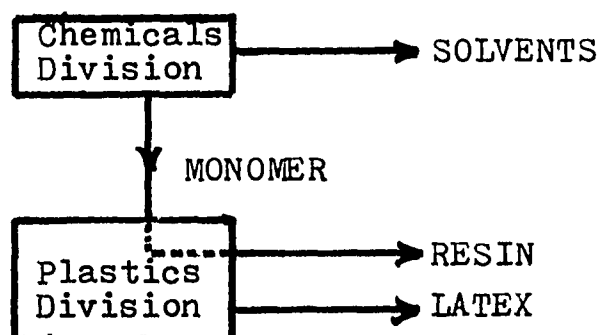
All sixteen sets of instructions can be formed from different combinations of these two sets of instructions.

INSTRUCTIONS FOR CHEMICAL DIVISION REPRESENTATIVES

I. GENERAL

You are about to participate in a business game, the purpose of which is to determine how two divisions of the same company make decisions.

You and one other in your class have been randomly chosen to assume the role of a team of executives of the Chemicals Division of the ABC Company. As shown in the following diagram, ABC has two divisions, Chemicals and Plastics, each of which produce two products.



Your division, Chemicals, produces SOLVENTS for sale to outside firms and MONOMER, a chemical specialty made for the Plastics Division, who convert it into RESIN for sale to plastics fabricators. In addition, the Plastics Division manufactures LATEX, made entirely from raw materials purchased from sources outside of the ABC Company.

The production facilities of the two Divisions are located adjacent to each other within the same ABC industrial site.

Your assignment is to make a variety of decisions concerning the Chemicals Division's operation during the next month, and at later sessions, for subsequent months.

These decisions include:

1. Production level for SOLVENTS
2. Price to be charged SOLVENTS customers
3. Expenses to be allocated to the marketing of SOLVENTS
4. Price at which MONOMER is to be transferred (sold) to the Plastics Division
5. Quantity of MONOMER to be produced and then sold to the Plastics Division

The first three decisions can be made without consultation with others, since they are entirely within your own Division's control. However, you will be competing with other teams in your class and in other classes, who will be making similar decisions and will be competing with you in the market place. In fact, your efforts will, in part, be judged on how well you perform relative to the others.

The last two decisions will require you to meet with two executives (also randomly chosen from your class) from the Plastics Division, since you will have to agree with them on the price and quantity of MONOMER that will be transferred to the Plastics Division.

A product very similar to MONOMER is available on the outside market at a price of 15 cents per pound, delivered in 55 gallon drums (containing about 350 pounds per drum) or 14.5 cents per pound, delivered in 8000 gallon tank

cars. Although ABC policy does not normally require divisions to purchase raw materials from each other, in this case it is required, since the company wants to keep the MONOMER product specifications confidential.

Top management of ABC Company believes in decentralization and has set up the divisions as independent profit centers. In line with this policy, top management does not get involved with interdivisional matters such as the determination of the price and quantity of materials transferred within the Company. Further, the executives of the respective divisions are evaluated and rewarded on the basis of profit center performance, to the extent that about 80 percent of their total compensation package (including base salary, bonuses, stock purchase benefits) are dependent on divisional profit performance. As such, this will be representative of your own team's evaluation.

You might be curious as to the relative impact of the different products on your potential profitability. This is very difficult to predict for any particular team, since your profits will obviously depend on the quality of your decisions as well as those of others. However, in past exercises of this type, SOLVENTS have brought in profits of about \$2,000 - \$5,000, while MONOMER profits have been in the range of \$25,000 - \$80,000.

Attached are various graphs and charts that will be sufficient to permit you to make the aforementioned decisions. In addition, you are given more detailed

instructions on how to proceed.

You and your Chemicals Division associate should first meet to review the assignment, to be certain that it is clearly understood, to decide on your objectives and to determine your strategy. You are free to approach this assignment in any way that you believe to be appropriate. However, you are asked not to divide the decision making responsibilities. Rather, both team members should participate in making all decisions together. When you are finished with this get-together, please fill in Form A which asks you to list your objectives and the strategy you intend to follow.

You will have approximately 45 minutes to make the first set of decisions. Your decisions will then be used as input to a model of your Division, Company and industry. This model will be used to determine how your Division performed, with that aspect of performance measured in terms of divisional profits. You will also be given some general information on the SOLVENT industry, such as prices charged by your competitors and total industry sales. This should help you make subsequent decisions.

One last thing. Would you please refrain from discussing any aspect of this exercise with your classmates or others at the College until the entire sequence of decisions is completed. Thank you.

II. SOLVENTS DECISIONS

The industry in which you are competing consists of less than 10 firms, similar to the Chemicals Division in size, resources and current sales. All of your competitors have recently been selling SOLVENTS at a price of 50 cents per pound and have been spending about \$5,000 per month for marketing. All have \$100,000 in cash on hand.

Production

Figure 1 describes the relationship between quantity of SOLVENTS produced and total costs, excluding marketing expenses and taxes of 50 percent of income. * Your plant capacity is fixed during the next 12 months at 60,000 pounds per month. You are asked to determine the production of SOLVENTS during the next month and to note it and the cost of production (from Figure 1) on the Decision Form provided.

Price

The number of orders you receive will be determined, in part, by the price you charge relative to the rest of the industry. Keep in mind that very high prices could price you out of the market entirely, while very low prices could develop orders in excess of your capacity and could therefore have a negative impact on your profits. The price you charge is effective only during the next month. There is no carry forward effect to ensuing months. Please note your price on the Decision Form.

* For your convenience, unit costs are shown in Figure 1A.

Marketing Expenses

The number of orders you receive will depend not only on the price you charge, but on the amount of funds you allocate to marketing. Too much marketing could, in some circumstances, result in receiving orders beyond your ability to produce, and would therefore be wasteful and would tend to reduce profits. Too little marketing would restrict orders generated. Unlike the situation with prices, marketing efforts do have a longer lasting effect; the amount you spend now will be effective in future months, but at a declining level. Therefore, in any month, your orders will be more affected by current spending than by prior spending levels.

Inventory

You start this month with an inventory of 50,000 pounds of SOLVENTS, valued at 30 cents per pound. Your inventory will vary, depending on the relationship between production and orders received. For cost of goods sold calculations, inventory will be valued at total costs (per figure 1), on a FIFO basis.

III. MONOMER DECISIONS

Since there are no outside sales of MONOMER, you will incur no marketing costs. You will have to set a price on MONOMER, but this will have to be arrived at by agreement with the representatives of the Plastics Division. Since your MONOMER production is determined entirely by Plastics Division requirements, this decision will have to be made

in consultation with their representatives.

Figure 2 shows how total costs of MONOMER vary with production.* Your Division will incur no further costs. Maximum MONOMER capacity is 3,500,000 pounds per month. No MONOMER inventory is to be maintained, since MONOMER has poor stability.

You will have to reach agreement with the Plastics Division representatives within the 45 minutes allocated. You may break off discussions with them at any time during these 45 minutes in order to meet in private to decide on SOLVENT decisions, change strategy, etc. In the event you are not able to reach agreement on MONOMER price and/or quantity, please note on the Decision Form, your last offers, as well as those of the Plastics Division. If this should occur, please note on the Form the reasons why you were not able to do so. You should be aware that failing to reach agreement will have an unfavorable impact on your Division's evaluation, since corporate policy specifically states that agreements must be made without third party intervention.

IV. REPORTS

Following each decision, your team should complete and submit one copy of the Decision Form, making certain that you keep your own record of the decisions made.

At the next class, these data will be provided:

* For your convenience, unit costs are presented in Figure 2A.

SOLVENTS

1. Orders received
2. Sales made and delivered
3. Profits before taxes
4. Industry sales and orders
5. Prices charged by your competitors
6. Your inventory on hand and the value of the inventory

MONOMER

1. Profits from MONOMER sales

DIVISIONAL TOTALS

1. Before and after tax profits
2. Cash on hand

You will then be asked to make another set of decisions and to complete the Decision Form. Should any of your objectives or strategies change, you should also submit a revised Form A.

V. PERFORMANCE EVALUATION

Team performance will be evaluated on the basis of how well you achieved your stated objectives, the relationship of these objectives to ABC corporate policies, the ability to maintain adequate and reasonable inventories throughout the periods and your attendance at all decision meetings. As noted, failure to achieve an agreement on the price and quantity of MONOMER transferred will have a significant negative impact on your evaluation.

In short, you will be evaluated on the same basis as the evaluation of Chemical Division executives.

FIGURE 1
TOTAL SOLVENT COSTS

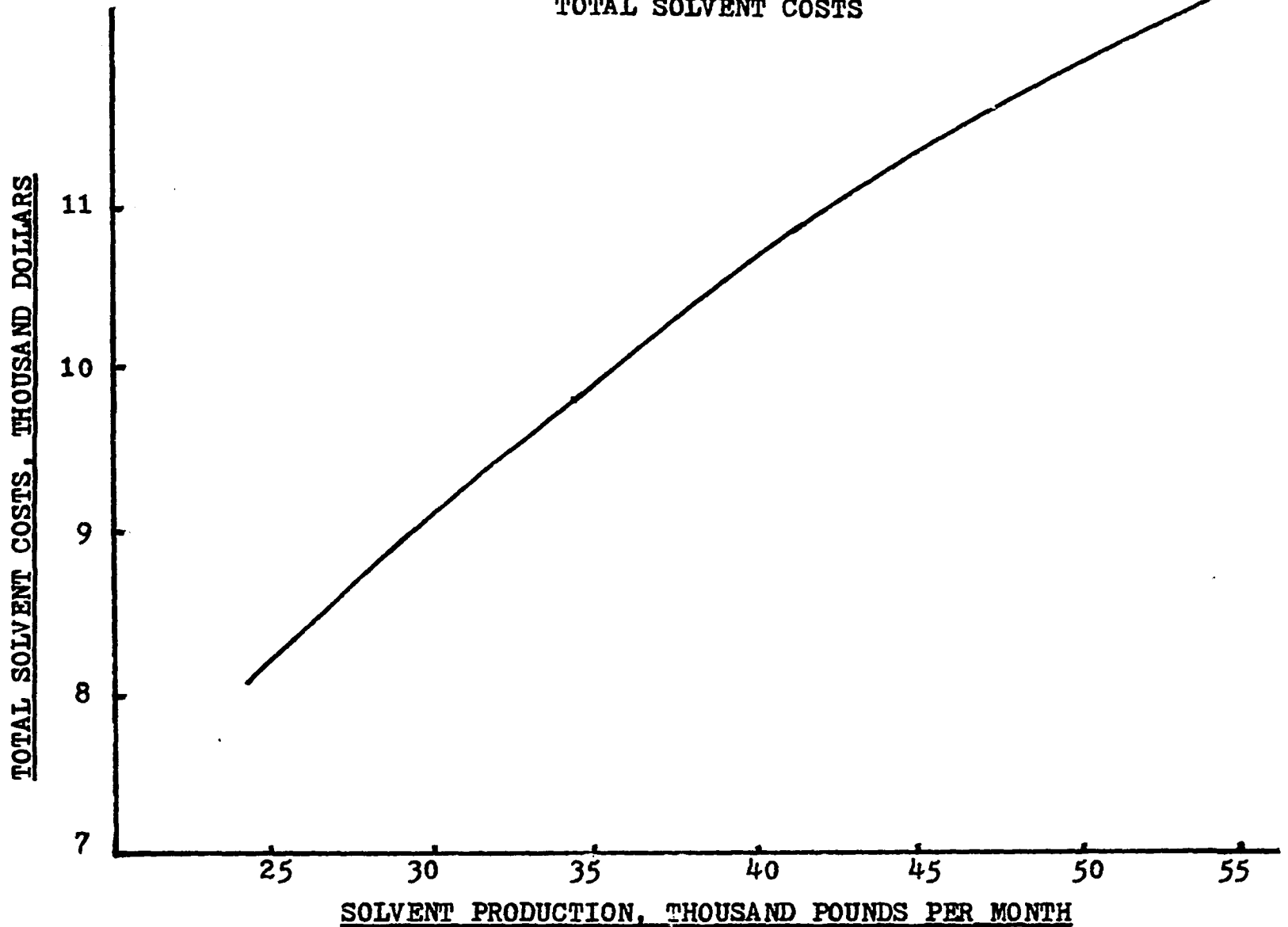


FIGURE 1A
SOLVENT UNIT COSTS

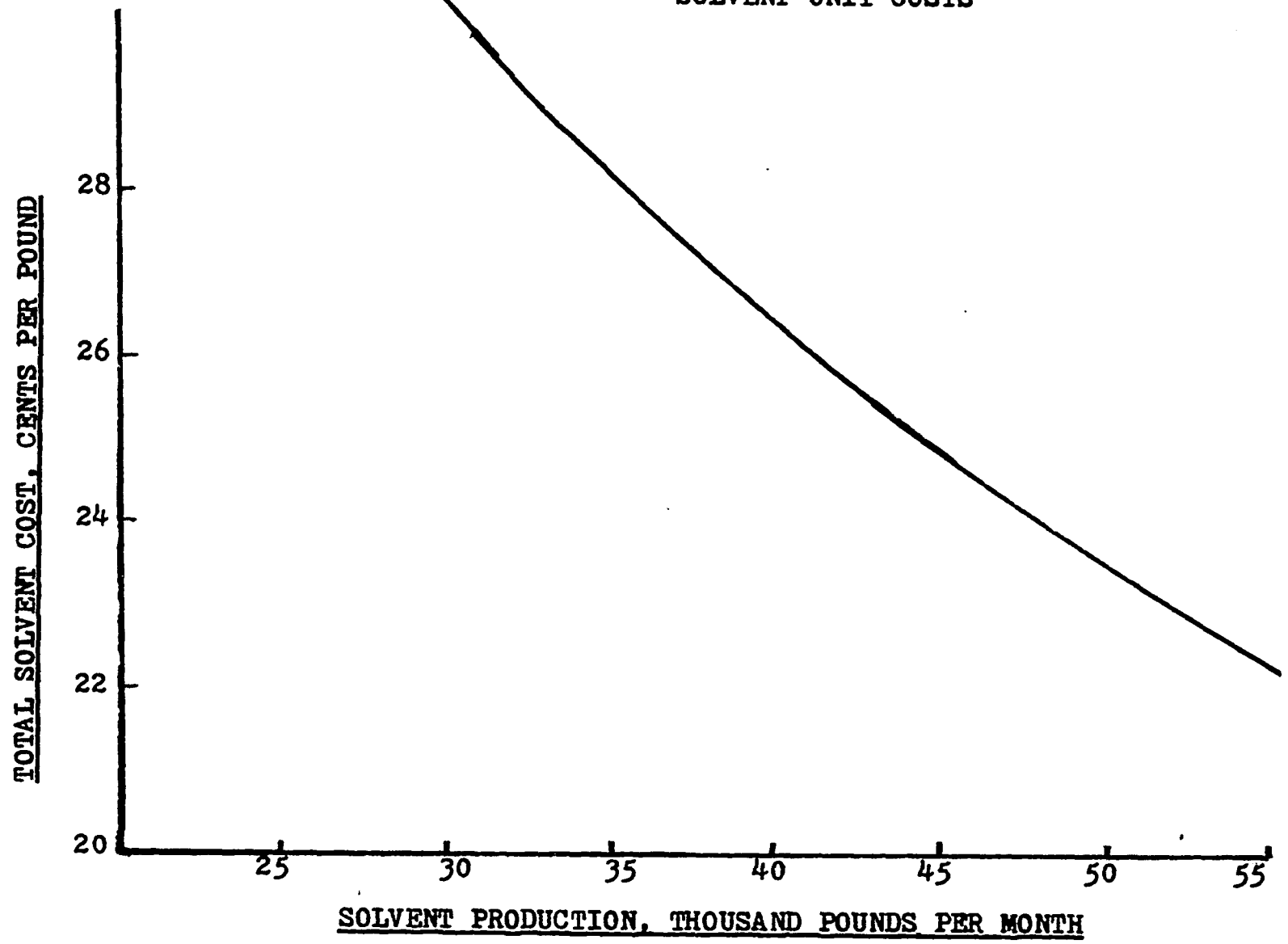


FIGURE 2
TOTAL MONOMER COSTS

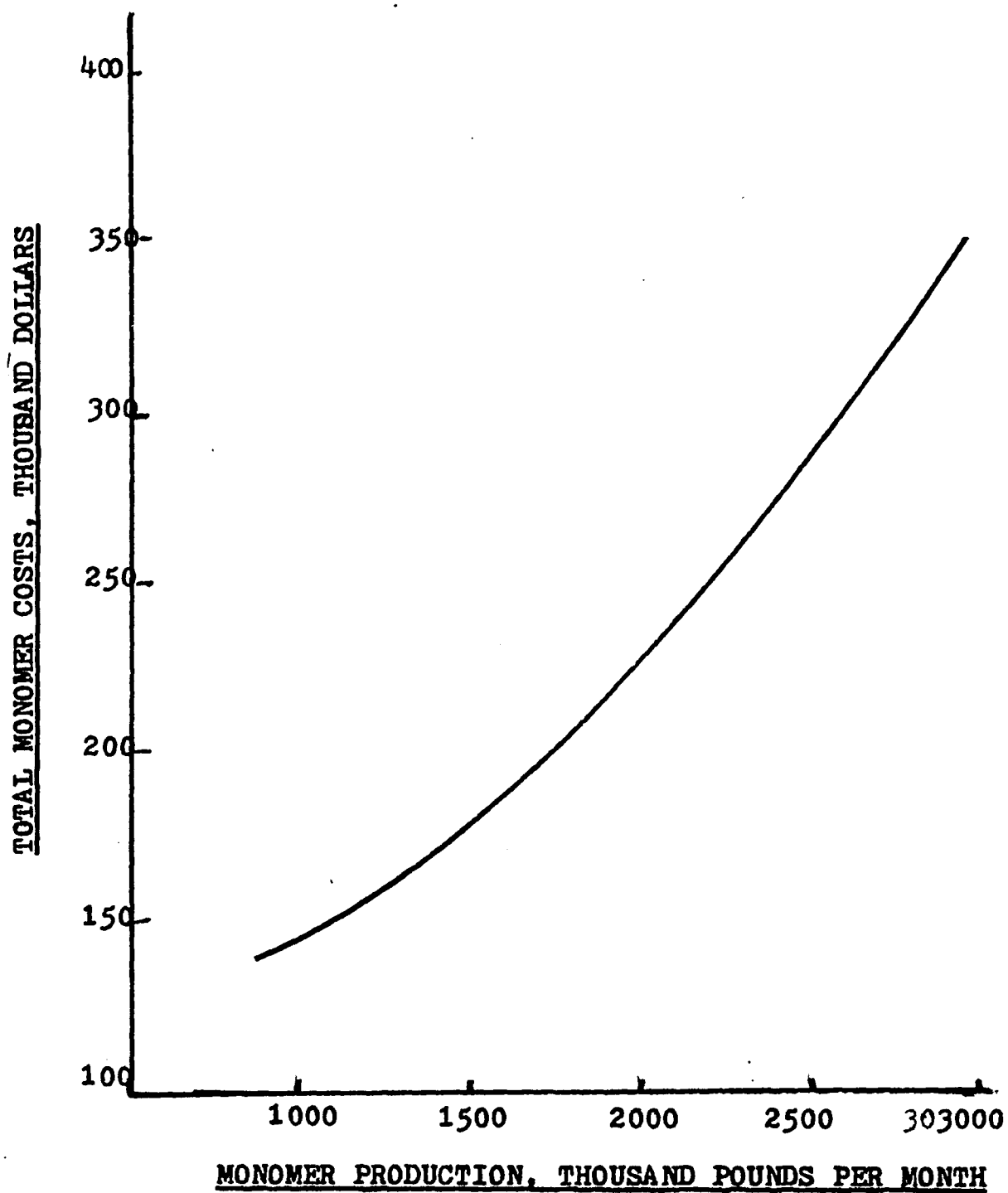
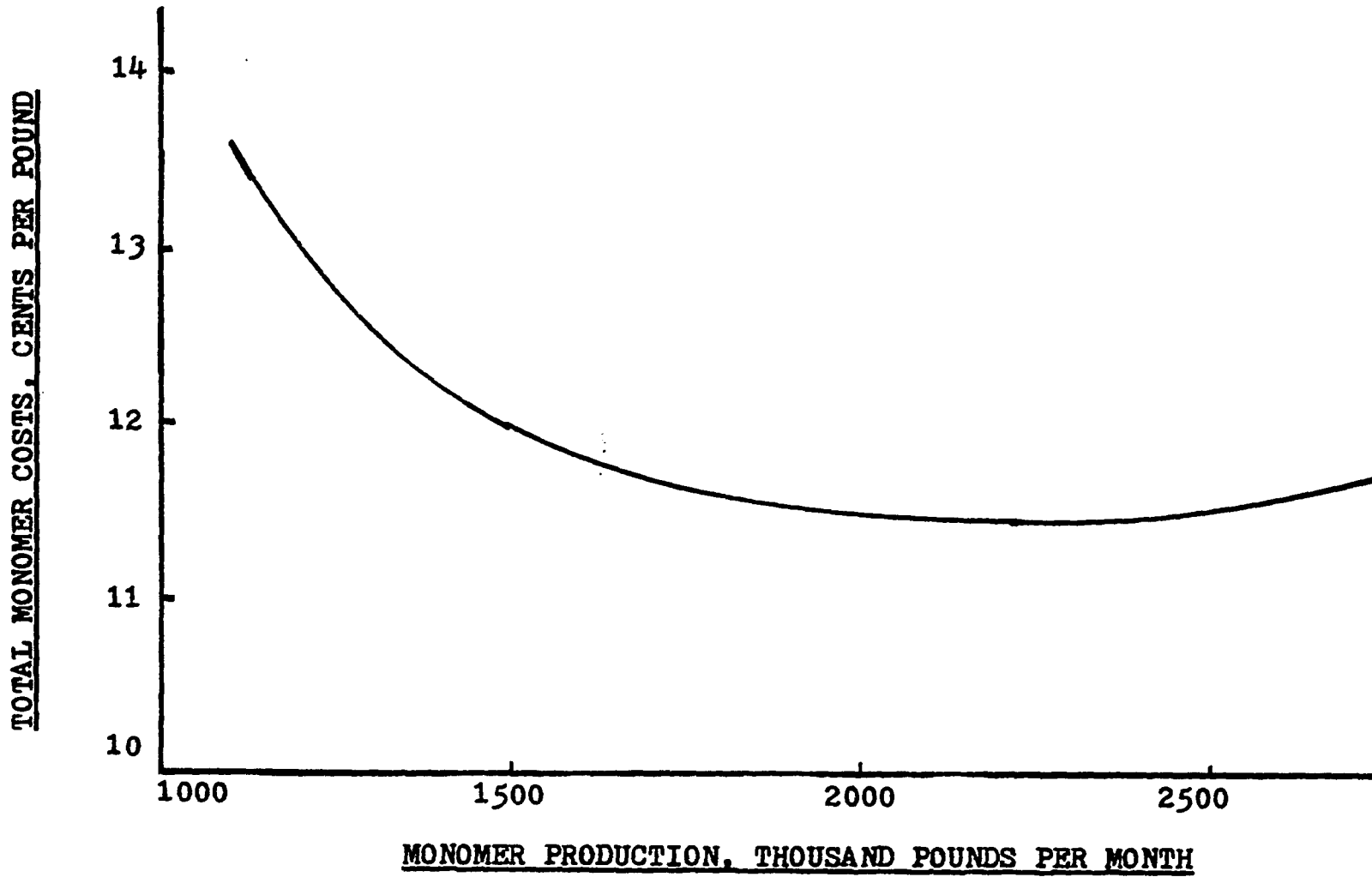


FIGURE 2A
MONOMER UNIT COSTS



FORM A

Division _____ Team Members _____
Team No. _____
Class _____ Date _____

1. The following objectives have been set for our
Division:

2. We expect to achieve our objectives through the use
of the following strategy:

CHEMICALS DIVISION DECISION FORM

Team No.	_____	Team Members	_____
Industry No.	_____	Class	_____
Decision No.	_____	Date	_____

SOLVENTS

Marketing Expenses	\$____,000
Price	____ cents per pound
Production Quantity	____,000 pounds
Production Cost	\$____,000

MONOMER*

Price	____ cents per pound
Production Quantity	____,000 pounds
Production Cost	\$____,000

* If agreement is not reached on MONOMER price and/or quantity, please indicate the reason why. Also note the final offers of both Divisions. NOTE: It is to your advantage to reach an agreement.

Reasons Why Agreement was not Reached: (Use other side if necessary)

Last Plastics Division Offers

Price	____ cents per pound
Quantity	____,000 pounds

Last Chemical Division Offers

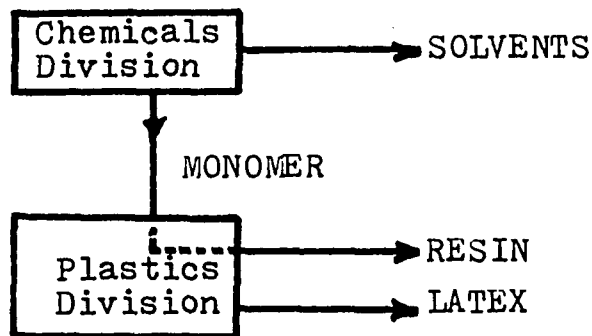
Price	____ cents per pound
Quantity	____,000 pounds

INSTRUCTIONS FOR PLASTICS DIVISION REPRESENTATIVES

I. GENERAL

You are about to participate in a business game, the purpose of which is to determine how two divisions of the same company make decisions.

You and one other in your class have been randomly chosen to assume the role of a team of executives of the Plastics Division of the ABC Company. As shown in the following diagram, ABC has two divisions, Chemicals and Plastics, each of which produce two products.



The Chemicals Division produces SOLVENTS for sale to outside firms and MONOMER, a chemical specialty made for the Plastics Division, who convert it into RESIN for sale to plastics fabricators. In addition, the Plastics Division manufactures LATEX, made entirely from raw materials purchased from sources outside of the ABC Company.

The production facilities of the two Divisions are located adjacent to each other within the same ABC industrial site.

Your assignment is to make a variety of decisions concerning the Plastics Division operations during the next month, and at later sessions, for subsequent months.

These decisions include:

1. Production level for LATEX
2. Price to be charged LATEX customers
3. Expenses to be allocated to the marketing of LATEX
4. Price at which MONOMER is to be transferred (sold) to the Plastics Division
5. Quantity of MONOMER to be purchased from the Chemicals Division

The first three decisions can be made without consultation with others, since they are entirely within your own Division's control. However, you will be competing with other teams in your class and in other classes, who will be making similar decisions and will be competing with you in the market place. In fact, your efforts will, in part, be judged on how well you perform relative to the others.

The last two decisions will require you to meet with two executives (also randomly chosen from your class) from the Chemicals Division, since you will have to agree with them on the price and quantity of MONOMER that will be transferred to the Plastics Division.

MONOMER is a specialty chemical that is made especially and only for the Plastics Division. It is not available on the open market, nor is it likely to be so, since ABC holds the key patents covering its manufacture.

Top management of ABC believes in decentralization and has set up the Divisions as independent profit centers. They therefore do not get involved with inter-divisional matters such as the determination of price and quantity of goods transferred between Divisions. In spite of the commitment to decentralization, top management believes that executive evaluation and reward systems should be based to a large extent on corporate, rather than divisional profits. They want to be sure that the Divisions cooperate with each other to maximize total ABC profits, rather than trying to maximize their own profits, irrespective of its impact on corporate profits.

Therefore, the ABC evaluation/reward system is such that 80 percent of executive compensation (including base salary, bonuses and stock purchase benefits) are based on corporate, rather than divisional profits. This will be the basis for your own evaluation.

You might be curious as to the relative impact of the different products on your potential profitability. This is very difficult to predict for any specific team, since your profits will obviously depend on the quality of your decisions, as well as those of others. However, in past exercises of this type, LATEX has brought in profits of about \$25,000 - \$80,000, while RESIN profits have been in the range of about \$2,000 - \$5,000.

Attached are various graphs and charts that will be sufficient to permit you to make the aforementioned

decisions. In addition, you are given more detailed instructions on how to proceed.

You and your Plastics Division associate should first meet to review the assignment, to be certain that it is clearly understood, to decide on your objectives and to determine your strategy. You are free to approach this assignment in any way that you believe to be appropriate. However, you are asked not to divide the decision making responsibilities. Rather, you should both participate in the making of all decisions together. When you are finished with this get-together, please fill in Form A, which asks you to list your objectives and the strategy you intend to follow.

You will have approximately 45 minutes to make the first set of decisions. Your decisions will then be used as input to a model of your Division, Company and industry. This model will be used to determine how your Division performed, with that aspect of performance measured in terms of divisional profits. You will also be given some general information on the LATEX industry, such as the prices charged by your competitors and total industry sales. This should help you make subsequent decisions.

One last thing. Would you please refrain from discussing any aspect of this exercise with your classmates or others at the College until the entire sequence of decisions is completed. Thank you.

II. LATEX DECISIONS

The industry in which you are competing consists of less than 10 firms, similar in size, resources and current sales, to the Plastics Division. All of your competitors have recently been selling LATEX at a price of 50 cents per pound and have been spending approximately \$50,000 per month for marketing. All have \$100,000 cash on hand.

Production

Figure 1 describes the relationship between quantity of LATEX produced and total costs, excluding marketing costs and income taxes, which are 50 percent of income. * Your plant capacity is fixed during the next 12 months at 600,000 pounds per month. You are asked to determine the production of LATEX during the next month and to note it, and the cost of production (from Figure 1) on the Decision Form provided.

Price

The number of orders you receive will be determined, in part, by the price you charge, relative to the rest of your competitors. Keep in mind that very high prices could price you out of the market entirely, while very low prices could develop orders in excess of your capacity, and could therefore have a negative impact on your profits. The price you charge is effective only during the next month. There is no carry forward effect

* For your convenience, unit costs are presented in Figure 1A.

to ensuing months. Note your price on the Decision Form.

Marketing Expenses

The number of orders you receive will depend not only on the price you charge, but on the amount of funds you allocate to marketing. Too much marketing could, in some circumstances, result in receiving orders beyond your ability to produce, and would therefore be waste and would tend to reduce profits. Too little marketing could restrict orders generated. Unlike the situation with prices, marketing efforts do have a longer lasting effect. The amount you spend now will be effective in the future, but at a declining level. Therefore, in any month, your orders will be more affected by current spending than by prior spending levels.

Inventory

You start this month with an inventory of 500,000 pounds of LATEX, valued at 30 cents per pound. Your inventory will vary, depending on the relationship between production and orders received. For cost of goods sold calculations, inventory will be valued at total costs (per Figure 1), on a FIFO basis.

III. RESIN DECISIONS

The RESIN market can be considered to be truly competitive. It is composed of many producers, all about the same size, all producing about the same quality material, and all selling at 30 cents per pound. There is little incentive to either raise or lower the price and you

should therefore consider it to be fixed.

RESIN sales potential exceed the capacity of the MONOMER facility, which is fixed in the short term to 350,000 pounds per month. Your RESIN sales will therefore be equivalent to the amount of MONOMER transferred to your Division from the Chemicals Division, since each pound of MONOMER produces about one pound of RESIN. You will have to set a price on the MONOMER you receive from the Chemicals Division. This decision, as well as the decision on the quantity transferred has to be made in consultation with the representatives of the Chemicals Division.

Figure 2 shows how total costs of RESIN vary with production.* These costs do not include the cost of MONOMER, but do include all other costs, including marketing. No MONOMER inventory is to be maintained, since the MONOMER has poor stability.

You will have to reach agreement with the Chemicals Division representatives within the 45 minutes allocated. You may break off discussions with them at any time during these 45 minutes in order to meet in private to decide on LATEX decisions, change strategy, etc. In the event you are not able to reach agreement on MONOMER price and quantity, please note on the Decision Form why such agreement was not made. Note also your last offers, as well as those of the Chemicals Division. You should be

* For your convenience, unit costs are presented in Figure 2A.

aware, however, that failing to reach agreement will have an unfavorable impact on your Division's evaluation, since corporate policy specifically states that agreements must be made without third party intervention.

IV. REPORTS

Following each decision, your team should complete and submit one copy of the Decision Form, making certain that you keep your own record of the decisions you have made.

At the next class meeting, your team will be given the following data:

LATEX

1. Orders received
2. Sales made and delivered
3. Cost of goods sold
4. Inventory on hand, and its value
5. Profits before taxes
6. Prices charged by your competitors
7. Total industry sales and orders received

RESIN

1. Profits ~~from~~ RESIN sales, before taxes

DIVISIONAL TOTALS

1. Before and after tax profits
2. Cash on hand

You will then be asked to make another set of decisions. Should any of your objectives and strategies change, please submit a revised Form A.

V. PERFORMANCE EVALUATION

Team performance will be evaluated on the basis of how well you achieved your stated objectives, the relationship of these objectives to ABC corporate policy, how well you maintained reasonable inventory levels, your attendance at all decision meetings. As noted, failure to reach agreement on MONOMER transfers will have a significant negative impact on your evaluation.

In short, you will be evaluated on the same basis as the evaluation of Plastics Division executives.

FIGURE 1
TOTAL LATEX COSTS

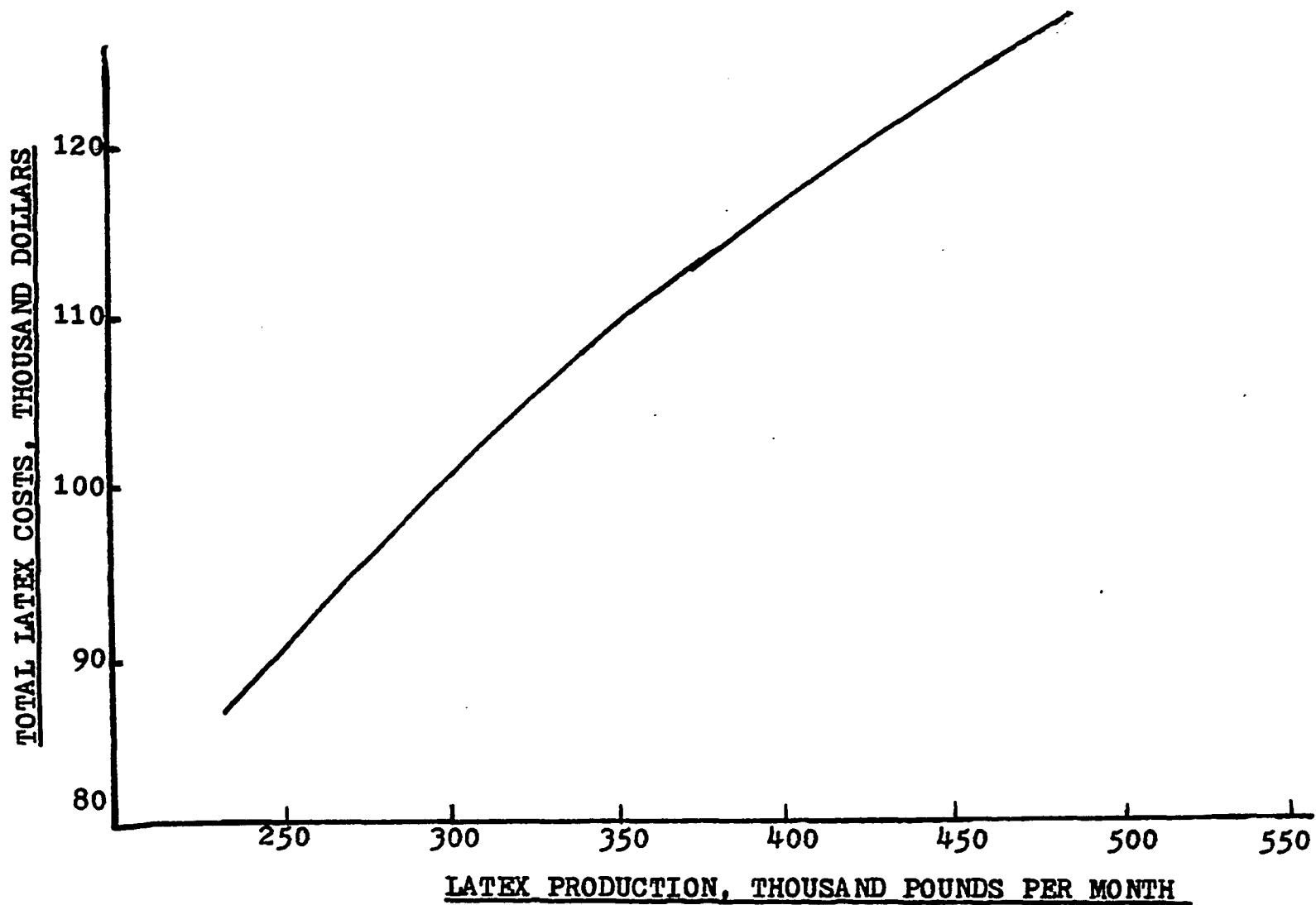


FIGURE 1A
LATEX UNIT COSTS

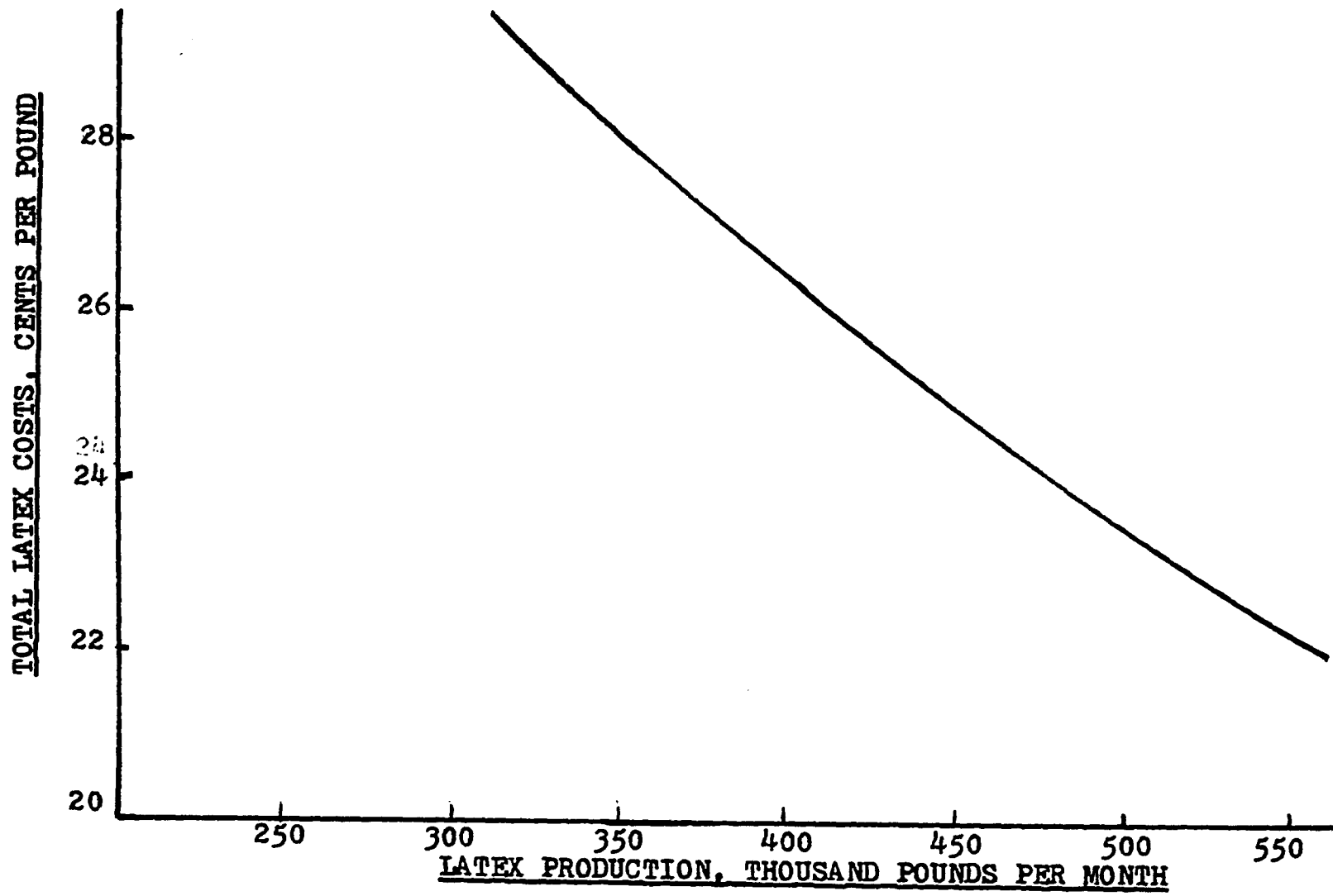


FIGURE 2
TOTAL RESIN COSTS
(EXCLUDING MONOMER COSTS)

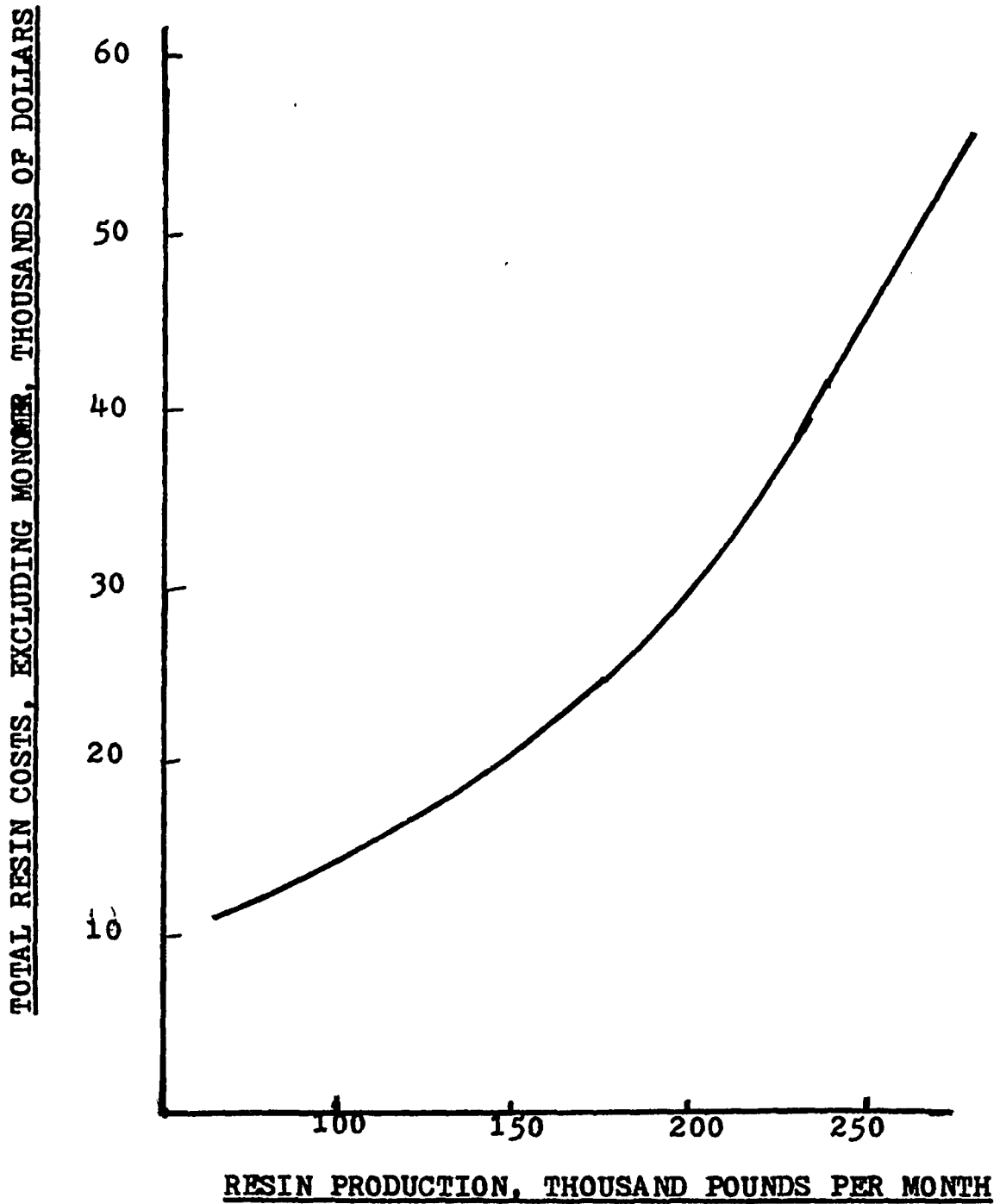
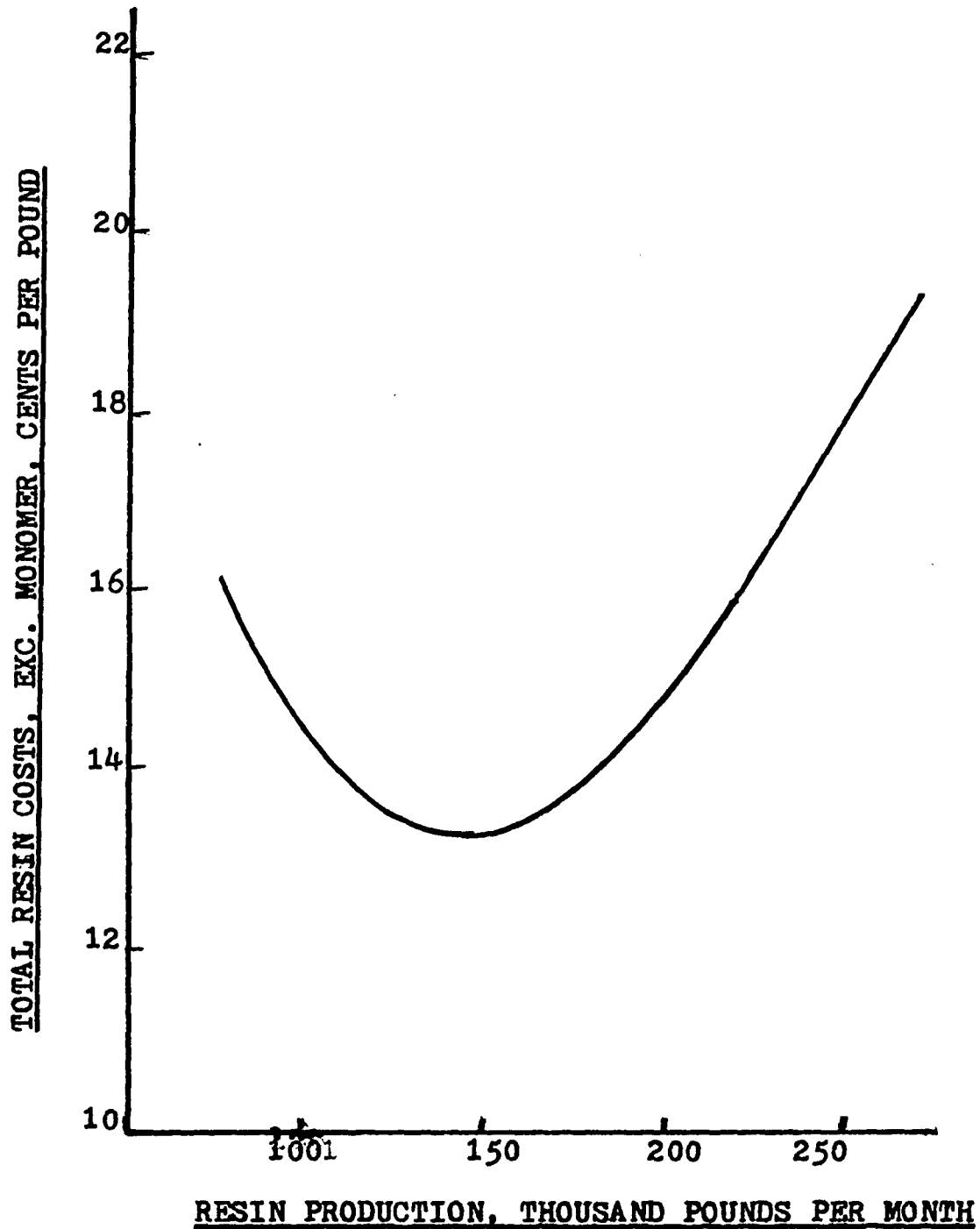


FIGURE 2A
RESIN UNIT COSTS
(EXCLUDING MONOMER COSTS)



PLASTICS DIVISION DECISION FORM

Team No.	_____	Team Members	_____
Industry No.	_____	Class	_____
Decision No.	_____	Date	_____

LATEX

Marketing Expenses	\$____,000
Price	____ cents per pound
Production Quantity	____,000 pounds
Production Cost	\$____,000

RESIN*

MONOMER Price	____ cents per pound
Production Quantity	____,000 pounds
Production Cost	\$____,000

* If agreement is not reached on MONOMER price and/or quantity, please indicate the reason why. Also note the final offers of both Divisions. NOTE: It is to your advantage to reach an agreement.

Reasons Why Agreement was not Reached: (Use other side if necessary)

Last Plastics Division Offers

Price ____ cents per pound

Quantity ____,000 pounds

Last Chemical Division Offers

Price ____ cents per pound

Quantity ____,000 pounds

FORM A

Division _____ Team Members _____
Team No. _____
Class _____ Date _____

1. The following objectives have been set for our
Division:

2. We expect to achieve our objectives through the use of
the following strategy:

APPENDIX C

POST-DECISION QUESTIONNAIRE (A)

Now that you have completed this series of decisions, it would be appreciated if you would complete the attached questionnaire which is concerned with your attitudes, views and possible future relationships with the other division and its members.

There are three parts to this questionnaire. In responding to each of them, try to think of yourself and the members of the other division within the framework of the ABC Company, rather than as classmates. In other words, try to divorce yourself from the classroom environment and relate to the environment of the simulation and decision exercise just completed.

Please carry out this phase of the exercise independently, without any consultation with other members of the class.

Thank you.

Name: _____ Class: _____
Team: _____ Division: _____

Part I.

1. Were you aware of the existence of a market price for the transferred product, MONOMER?

Yes _____

No _____

Not Sure _____

2. What importance did you attach to the price level of the transferred product, MONOMER, in relation to the total profit potential of your Division? Please place an "X" above the space that best describes your feeling.

_____ 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____
Very Of No
Important Importance

3. On what do you think your profit performance will be based? Please place an "X" above the space that best describes your feeling.

_____ 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____
Entirely Equal Weight Entirely
On Own Given To Own On
Division's Division's Combined
Profits Profits As Profits
Well As
Combined Profits
of Both Plastics
and Chemicals
Division

Part II.

On the following page is a list of pairs of adjectives that could be used to describe the members of the other division of your company.

Please consider each pair individually. If you feel that one of the adjectives in the pair is extremely descriptive of the members of the other division, you should place an "X" in the space immediately adjacent to the adjective (over the space marked 1 or 6). For example, suppose you are asked to rate the members of the other division on an optimistic-pessimistic scale, and you think they are extremely optimistic. In that case, you would place an "X" over number 1 as shown:

Optimistic $\frac{X}{1}$ $\frac{\quad}{2}$ $\frac{\quad}{3}$ $\frac{\quad}{4}$ $\frac{\quad}{5}$ $\frac{\quad}{6}$ Pessimistic

Or alternatively, if you think them extremely pessimistic:

Optimistic $\frac{\quad}{1}$ $\frac{\quad}{2}$ $\frac{\quad}{3}$ $\frac{\quad}{4}$ $\frac{\quad}{5}$ $\frac{X}{6}$ Pessimistic

If you think that the adjective is quite descriptive, but not extremely so, you should place an "X" in the space marked either 2 or 5, depending on which adjective is more closely descriptive. For example, if you think the members of the other division are quite optimistic or pessimistic, rather than extremely so, you would place the "X" as follows:

Optimistic $\frac{\quad}{1}$ $\frac{X}{2}$ $\frac{\quad}{3}$ $\frac{\quad}{4}$ $\frac{\quad}{5}$ $\frac{\quad}{6}$ Pessimistic

or

Optimistic $\frac{\quad}{1}$ $\frac{\quad}{2}$ $\frac{\quad}{3}$ $\frac{\quad}{4}$ $\frac{X}{5}$ $\frac{\quad}{6}$ Pessimistic

If you think that one of the adjectives is only slightly descriptive of the members of the other division, then you should place the "X" on the scale as follows:

Optimistic $\frac{\quad}{1}$ $\frac{\quad}{2}$ $\frac{X}{3}$ $\frac{\quad}{4}$ $\frac{\quad}{5}$ $\frac{\quad}{6}$ Pessimistic

or

Optimistic $\frac{\quad}{1}$ $\frac{\quad}{2}$ $\frac{\quad}{3}$ $\frac{X}{4}$ $\frac{\quad}{5}$ $\frac{\quad}{6}$ Pessimistic

IMPORTANT:

1. Please be sure that you place the "X" marks in the middle of the spaces, not at the boundaries.

2. Do not use more than one "X" for any pair of adjectives.
3. Do not skip any adjective pairs.
4. Try to make your judgments relative to each pair of adjectives independent and separate from the others.

On this page, please indicate how you view the members of the other division.

CONCILIATORY	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	UNCONCILIATORY
RIGID	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	FLEXIBLE
FRIENDLY	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	HOSTILE
FAIR	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	UNFAIR
UNCOMPROMISING	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	COMPROMISING
OPEN	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	SECRETIVE
COOPERATIVE	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	UNCOOPERATIVE
UNTRUSTWORTHY	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	TRUSTWORTHY
BROAD-MINDED	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	NARROW-MINDED
DISHONEST	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	HONEST
UNREASONABLE	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	REASONABLE
GENEROUS	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	GREEDY

Part III.

The following statements describe ways that could be used to handle disagreements between yourself and representatives of the other division. Please place an "X" above the space that best indicates how likely you would use each of these methods to resolve such disagreements.

a) Avoid interaction with the other division members as much as possible and try not to be dependent on them for anything.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

b) Try to force the other division to accept your position.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

c) Play down the differences and emphasize common interests.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

d) Bring the disagreement clearly into the open and try to find that solution which is most beneficial to the company as a whole, even if it means having to sacrifice some of your own goals.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

e) Do everything you could to try to convince the other division to accept your solution.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

f) Search for an intermediate position; try to find a compromise.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

g) Try to avoid offending the members of the other division.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

h) Use any method available to you, such as threats, to coerce the other division to accept your point of view.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

i) When problems arise, work with the other division to solve them.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

j) Refrain from argument; try not to get involved.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

k) Try to persuade the other division that your point of view has more merit than theirs..

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

l) Use bargaining to settle differences.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

m) Make every effort to smooth over any differences you have with the other division.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

n) Use whatever power you have to win acceptance of your point of view.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

o) Indicate a willingness to make some concessions if the other division would make some concessions of their own.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

p) Ignore the disagreement.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

q) Use logical and emotional arguments to get the other division to accept your position.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

r) If a disagreement arises, sit down with the other division and work it out.

<u>Very</u> Likely	<u>Quite</u> Likely	<u>Somewhat</u> Likely	<u>Somewhat</u> Unlikely	<u>Quite</u> Unlikely	<u>Very</u> Unlikely
-----------------------	------------------------	---------------------------	-----------------------------	--------------------------	-------------------------

APPENDIX D

POST-DECISION QUESTIONNAIRE (B)

Instructions:

Since the two divisions are part of the same company, it is likely that situations would arise that would require some interaction between them. We are interested in knowing how you and your divisional associate would be likely to react to a number of such situations that could occur. For each of the four situations that follows, there are listed five possible responses that you, as an executive of your division could make.

Would you please circle the one response which best describes your probable action in response to each of the situations. You should discuss each situation with your associate and agree on one divisional response for each situation.

IMPORTANT:

- Please make sure that you circle only one response per situation.
- Respond to each situation. Do not skip any situations.
- There is no correct or best answer and, therefore, there is no "grading" implied as to the correctness of your choices.

Team Number: _____ Class: _____
 Division: _____ Names: _____

Situation A

It has been decided that a new liaison position would be set up to facilitate the transfer of goods and to coordinate the various joint efforts of the divisions. Your division has someone who would be perfect for the job, but he has a very responsible position, a good future with your division and would be very hard to replace. It is generally agreed that your division would suffer from this transfer, although from a company standpoint, such loss would be more than compensated for by markedly improved efficiency of product transfers. Your division has a backup man in mind, but he still needs about a year of further training.

Would you, as General Manager of your division:

- i. Agree to immediately transfer the man to the new position and promote the backup man to replace him
- ii. Make the man available for liaison work for about 50% of his time over the next 3-4 months and full-time thereafter, with the understanding that he would be available to you should a crisis occur
- iii. Consider letting the man go in about six months, but then only on a part-time basis until a suitable replacement is trained to your satisfaction
- iv. Oppose the situation, however will transfer the man in a year when the new man is fully trained. Would expect some compensation from either the other division or from the company
- v. Would not transfer the man. He is too valuable to your division now and has great potential for the future

Situation B

Your division has just completed a major marketing research project that took two years to complete and cost \$200,000. The other division would like to have the report to help it plan for its capital and research program and to assist some of its customers in their own marketing efforts. They have asked you for a copy of the report. This would undoubtedly increase the short term sales of the other division because of the increased service it could render to its customers. It would also greatly improve the probability of success of its research program, since it would have a better grasp of market needs. However, it is possible that your market position would be adversely affected should the report fall into the hands of your competitors. All agree that this is possible.

Would you, as General Manager of your division:

- i. Agree to give the report to the other division to be used by them in any way they think is appropriate
- ii. Give the other division the report, with the understanding that it would not be used for external purposes unless your approval was obtained in advance
- iii. Give the other division the report, but would insist that it not be used outside the company, even in non-competitive areas
- iv. Allow the other division to read the report in your office if they agree to use the information for internal purposes only, but would not allow them to have a copy
- v. Refuse to give the report or any information to the other division. The potential risk to your division

is of more importance to you than the improvement in the other division's operations, no matter how good for the overall operations of the entire company

Situation C

Your division has adequate warehouse facilities in Chicago. The other division does not, and has suggested that your division join with them in building a new, larger joint facility. Costs to your division would probably remain about the same, although there is a 20% chance that the costs would be somewhat higher than your current costs. Also, there is likely to be some disruption of service as a result of the new construction and relocation. However, combined costs would be much lower than if the other division were to build a separate facility. There is no room for expansion of your facilities beyond that required to meet your foreseeable needs.

Would you, as General Manager of your division:

- i. Agree to the proposal without reservations or compensation
- ii. Agree to the proposal, but would insist on compensation from the other division for any differences in costs
- iii. Agree to the proposal if you received total compensation for cost differential and assurance that you could name the manager of the joint operation, have him report to you, and thereby assure your division of preferential treatment
- iv. Request that the other division rent some space for the next 1-2 years, even though this would cause considerable expense and inconvenience to them; This would give you time to decide whether you wanted to tie your division's operations to those of the other division. If you did later decide to do so, you would need assurance that you could name the manager of the joint facility, have him report to you, and thereby assure your division of preferential treatment.

- v. Be unwilling to seriously consider the proposal, even if compensation is included, since it would create problems and inconvenience for your division and its customers

Situation D

An important customer of the other division has a technical problem, the answer to which is likely to be known by the technical staff of your division. They have asked you to help them solve this problem for their customer who is a potential competitor of yours. If the problem is solved, the customer has agreed to sign a long term purchase agreement with the other division at very attractive prices, such that the profit to the other division would be substantially greater than any possible loss to your division caused by the actions of your competitor.

Would you, as General Manager of your division:

- i. Agree to help the other division by providing specific information free and, if necessary, send in your own technical people to solve the problem for the other division's customer at no charge to them or to the other division
- ii. Agree to give the other division specific information, without charge, at a meeting attended by representatives of the technical departments of the two divisions
- iii. Agree to give the other division a limited amount of general information free, but for specific information or for direct assistance, the other division must pay compensation to cover all costs
- iv. Refuse to give any information to the other division unless they, or their customer, agreed to buy the information or to pay a royalty over the next five years. Total compensation would have to include total costs plus a considerable profit
- v. Refuse to give any information, since you will not help a potential competitor, no matter how useful it might be to the other division or the company as a whole

Situation E

The company is in the midst of allocating research funds to the divisions. The other division has suggested that your division include in its research program a large project that has an excellent chance of significantly improving the other division's competitive position. The project has a significantly higher profit potential than any of your division's projects. Only your division has the know-how and the equipment to successfully carry out the entire project, although some of it could be done by others, at reduced efficiency and competence. To take on this project, you would have to cut some of your own projects, since the total research budget is fixed and there is no possibility of increasing it.

Would you, as General Manager of your division:

- i. Agree to cut your own program as suggested and to substitute the other division's project. Since you have the expertise, you would agree to coordinate all activities. Compensation would be at cost.
- ii. Limit your responsibility to carry out only those parts of the project that could not be handled by the other division or by outsiders. Since your division has the expertise, you would agree to coordinate all of the activities of the various laboratories. Compensation would be at cost.
- iii. Limit your responsibility to carry out only those parts of the project that could not be handled by the other division or by outsiders. The other division would have to assume responsibility for coordinating all of the activities of the various laboratories, even though this would have the effect of reducing the overall efficiency of the project and extending the time to completion. Compensation would be at cost.
- iv. Consider undertaking the research project only if the other division pays enough for your efforts, so that

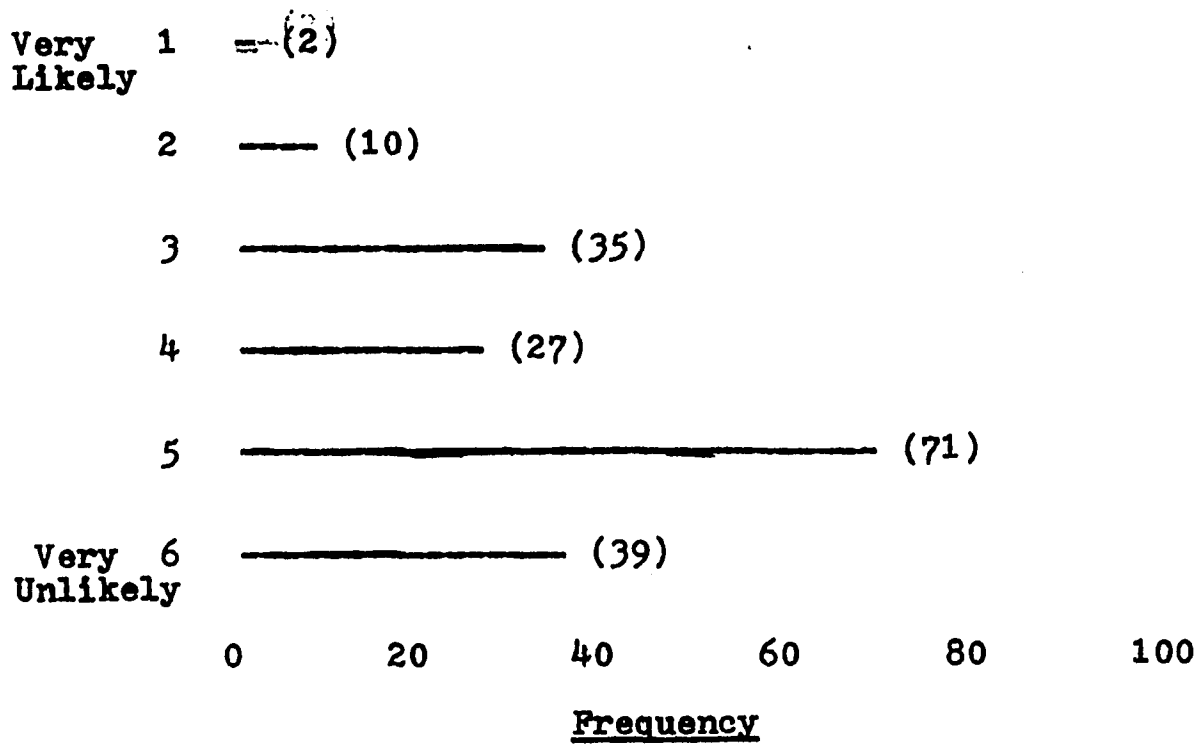
none of your projects would be dropped. This would mean that you would receive compensation considerably in excess of your direct costs and would result in the elimination of some projects of the other division that had more profit potential than your own. The other division would have to assume responsibility for coordination of all activities.

- v. Refuse to undertake the work under any circumstances. The added load on research management and control would detract from your own projects, no matter what compensation you received from the other division.

APPENDIX D

DESCRIPTIVE STATISTICS
FOR ITEMS IN
CONFLICT RESOLUTION SCALE

Item a - Avoidance



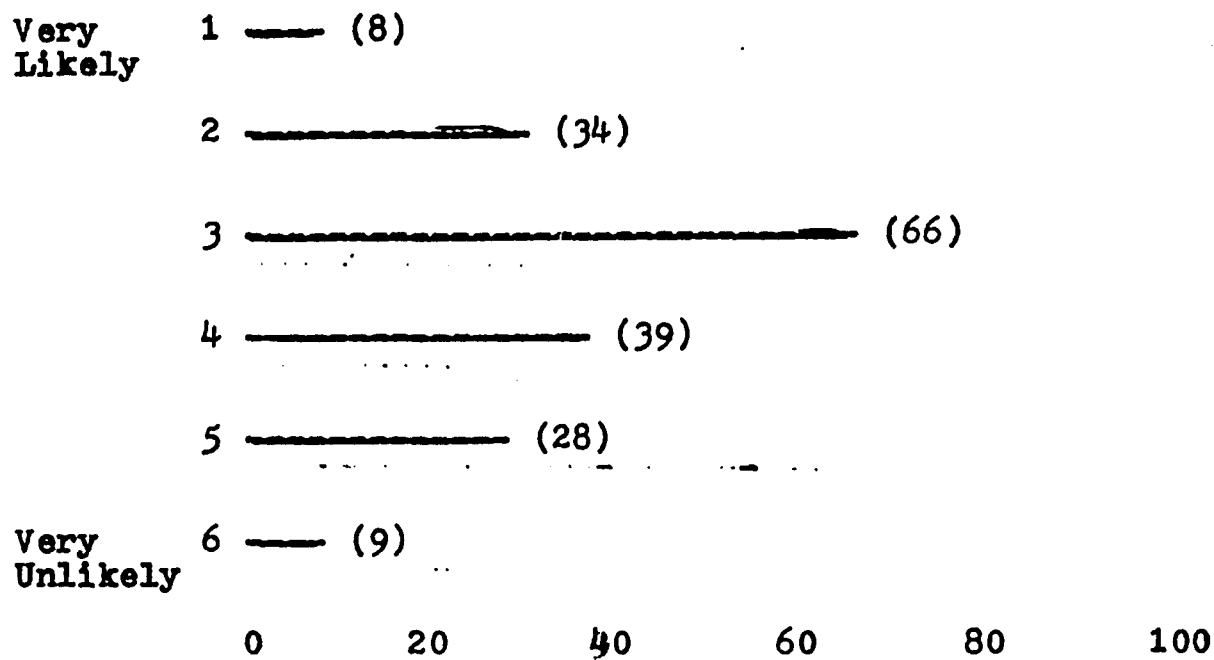
Mean 4.478
Mode 5.0
Median 4.754
Variance 1.519

Notes: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item b - Forcing



Frequency

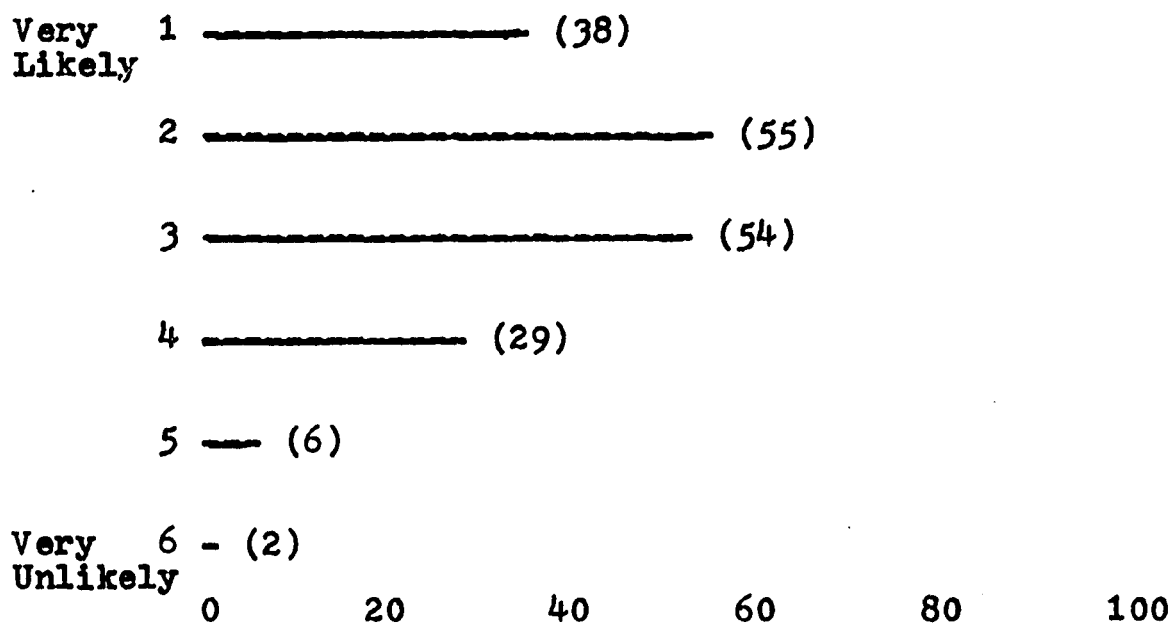
Mean 3.391
Mode 3.0
Median 3.258
Variance 1.474

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item c - Smoothing



Frequency

Mean 2.543

Mode 2.0

Median 2.482

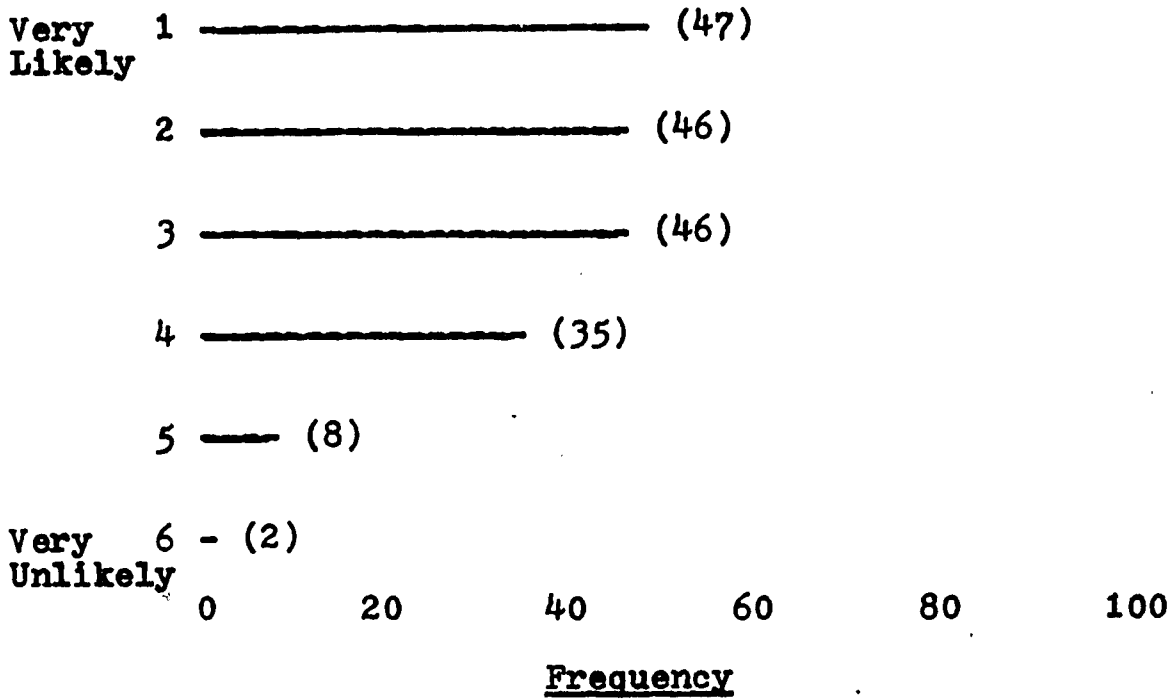
Variance 1.310

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item d - Problem Solving



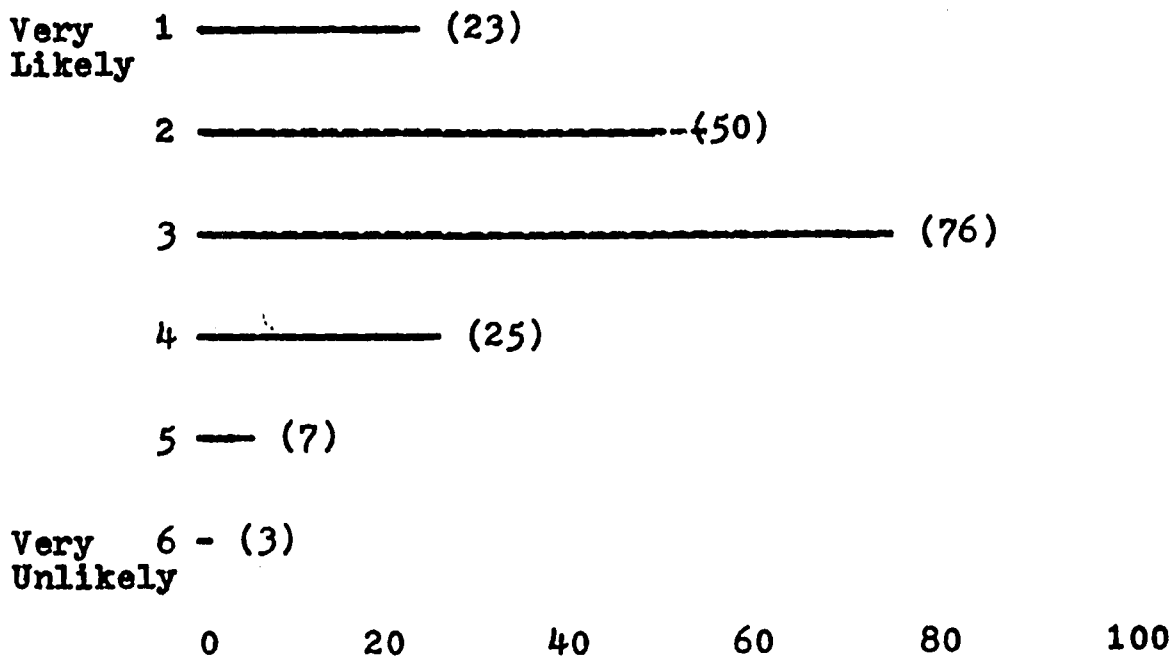
Mean 2.549
Mode 1.0
Median 2.478
Variance 1.539

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item e - Persuasion



Frequency

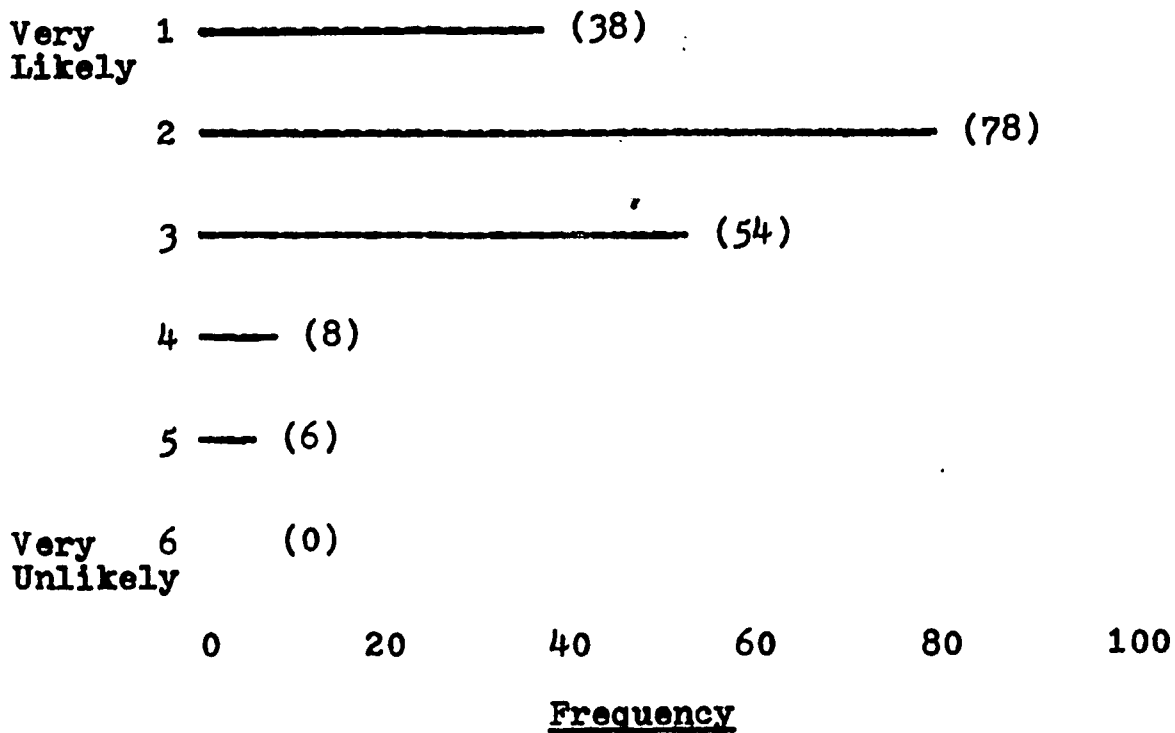
Mean 2.739
Mode 3.0
Median 2.75
Variance 1.145

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item f - Bargaining



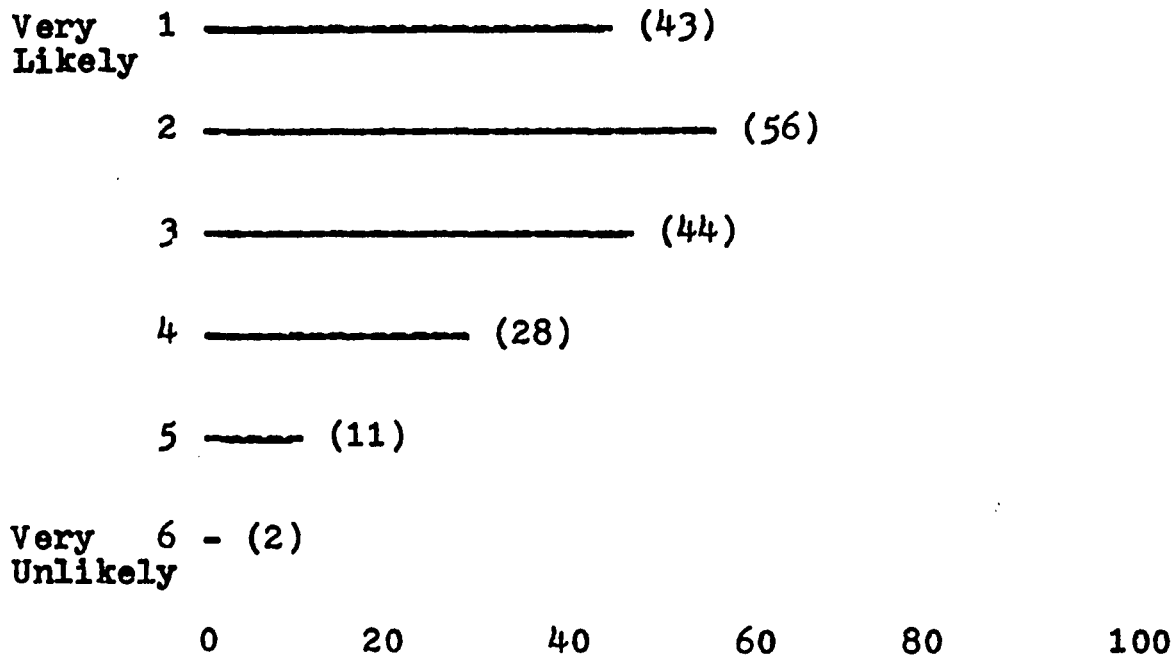
Mean 2.272
Mode 2.0
Median 2.192
Variance 0.898

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item g - Smoothing



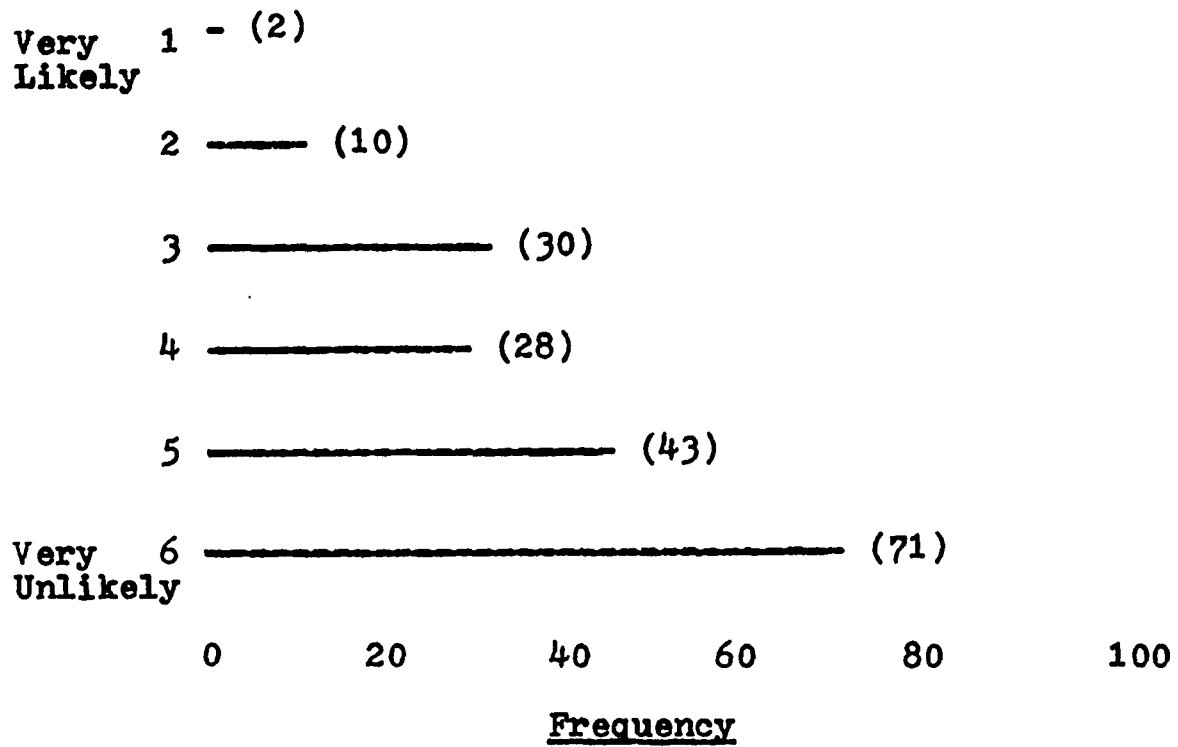
Mean 2.533
Mode 2.0
Median 2.375
Variance 1.518

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item h - Forcing



Mean 4.701

Mode 6.0

Median 5.012

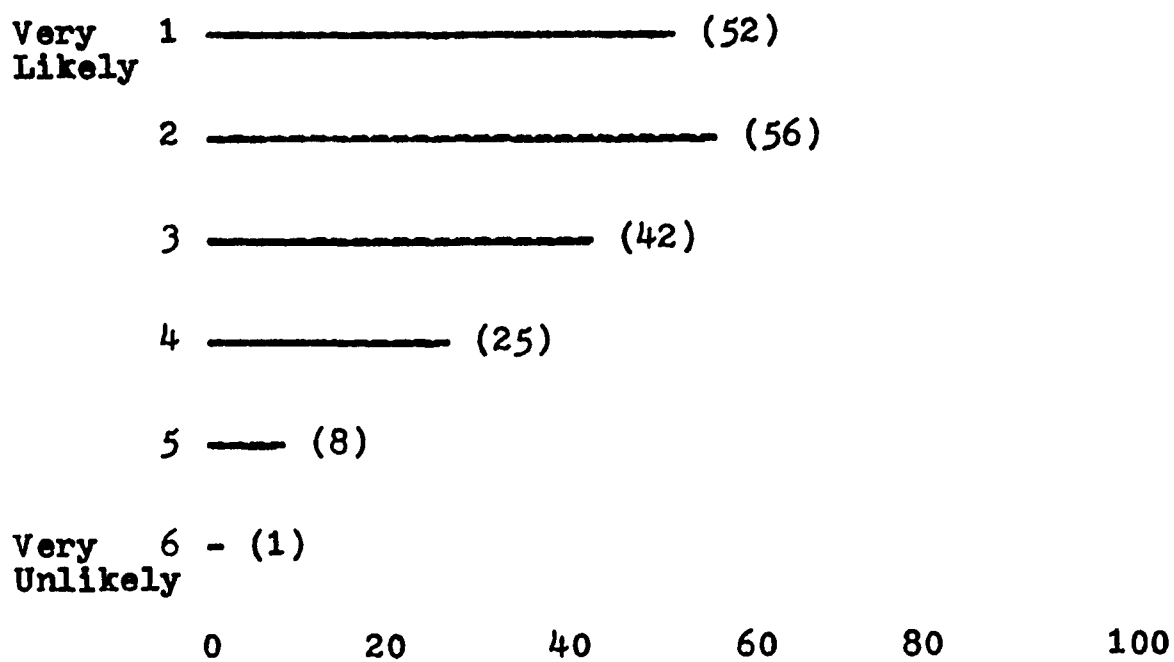
Variance 1.774

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item i - Problem Solving



Frequency

Mean 2.370

Mode 2.0

Median 2.214

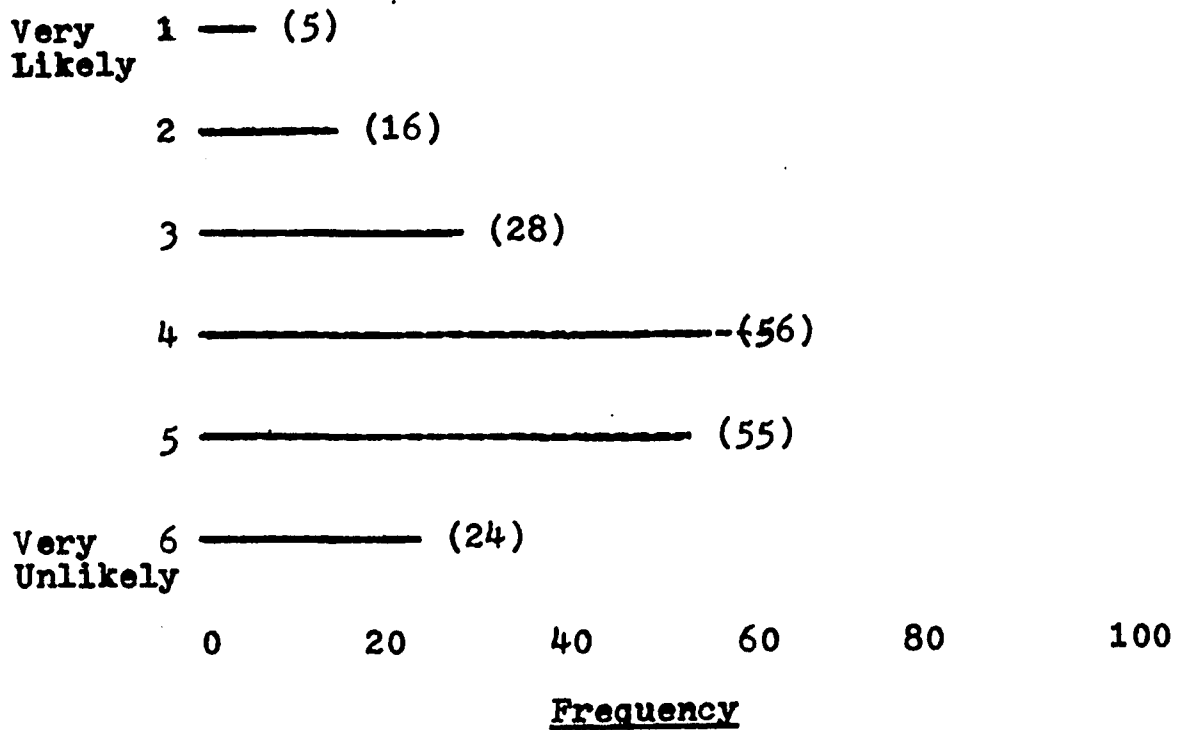
Variance 1.404

Note: n=184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item j - Avoidance



Mean 4.154.152

Mode 4.0

Median 4.268

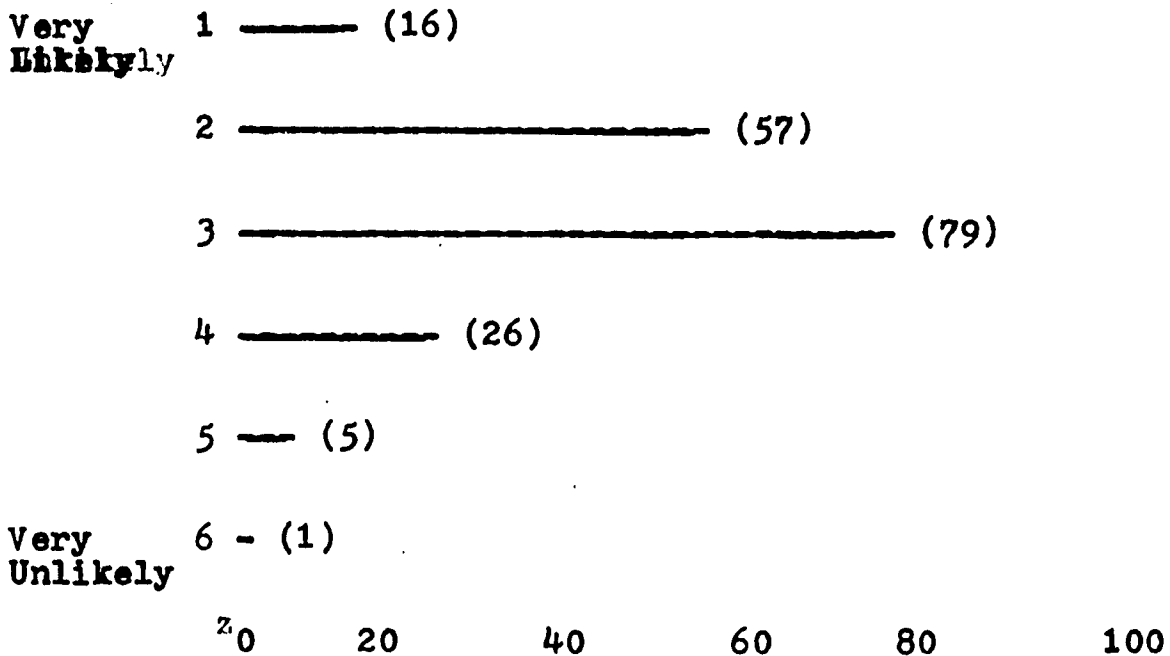
Variance 1.550

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item k - Persuasion



Frequency

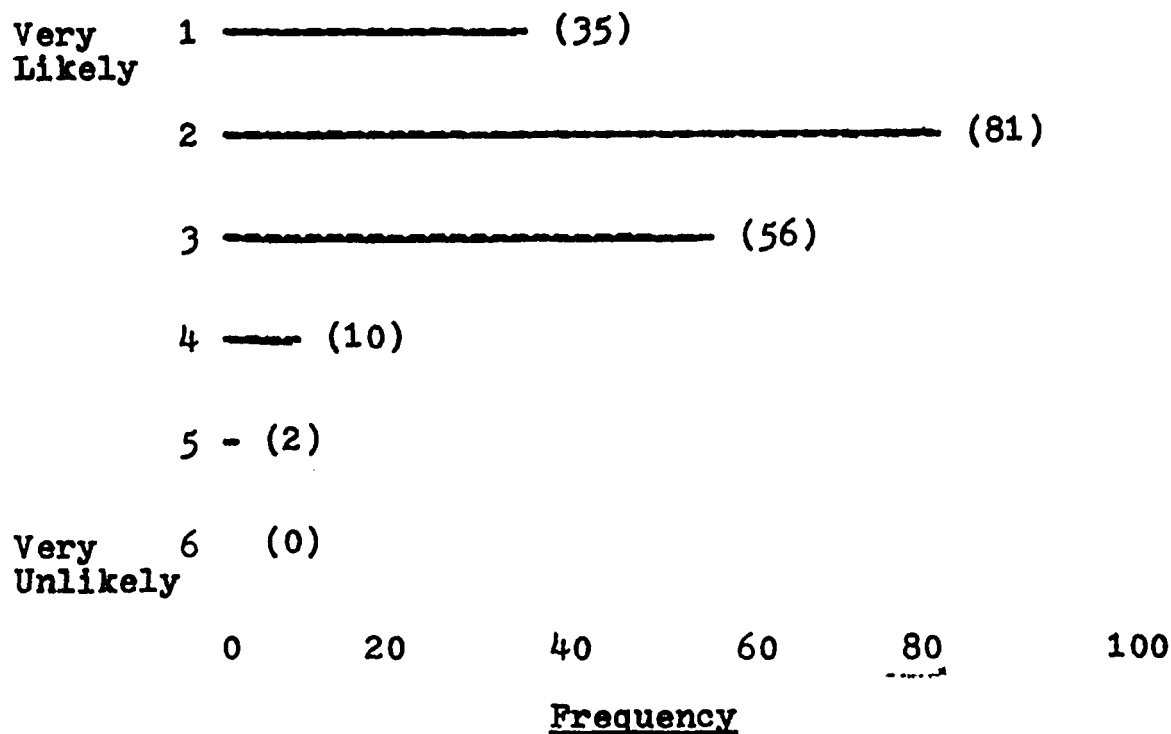
Mean	2.728
Mode	3.0
Median	2.741
Variance	0.888

Note: n = 184

Parentheses indicate number of subjects

APPENDIX B - Continued

Item 1 - Bargaining



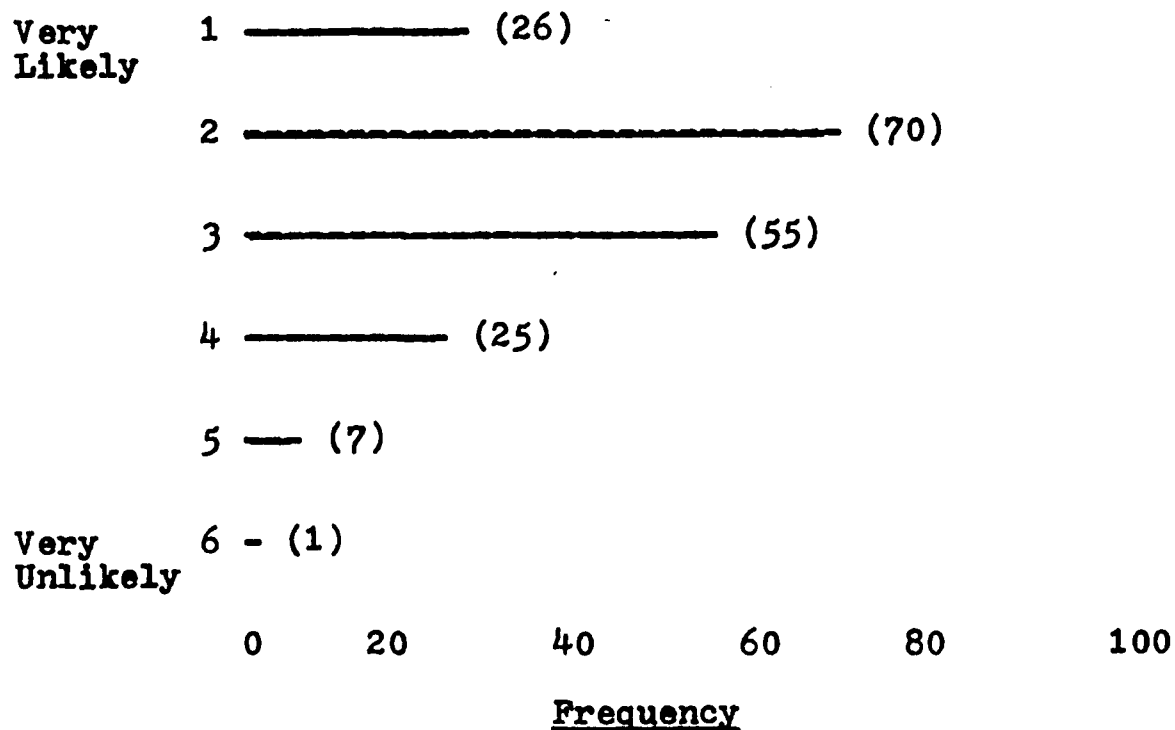
Mean 2.255
Mode 2.0
Median 2.204
Variance 0.749

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item m - Smoothing



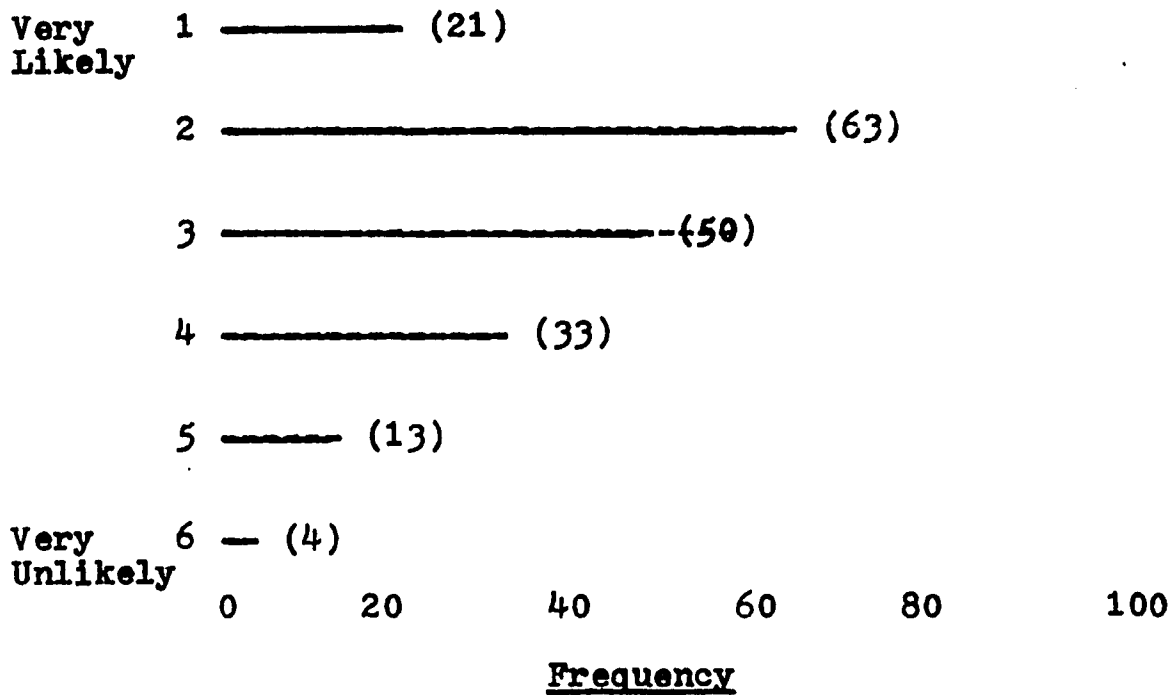
Mean 2.565
Mode 2.0
Median 2.443
Variance 1.100

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item n - Forcing



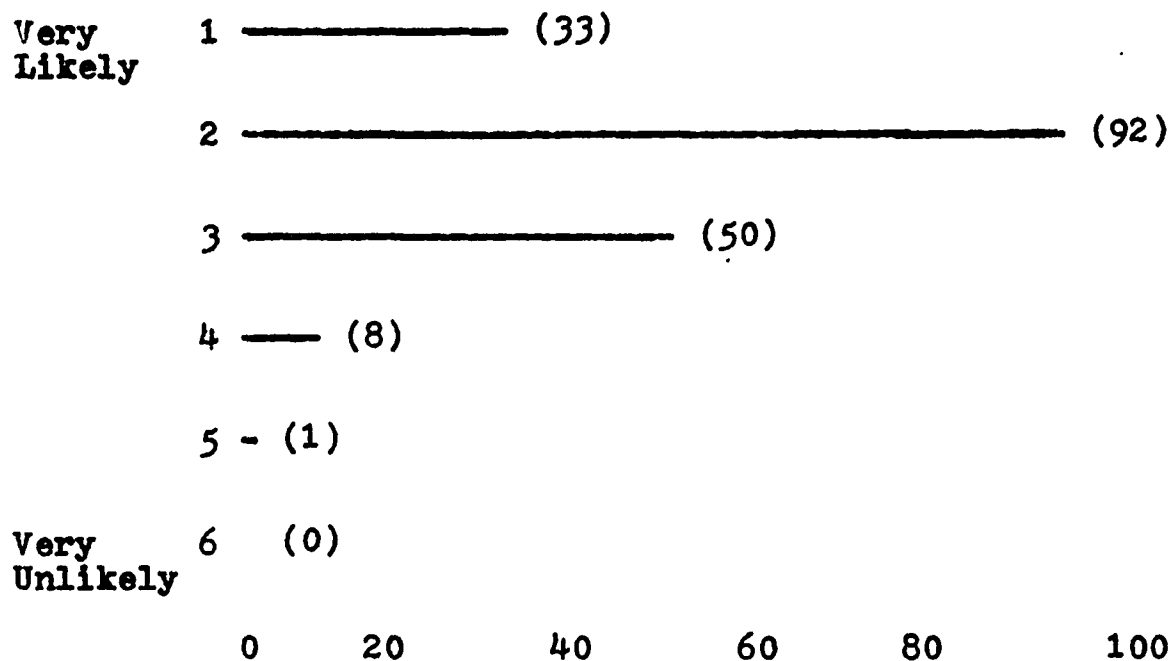
Mean 2.815
Mode 2.0
Median 2.660
Variance 1.430

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item 0 - Bargaining



Frequency

Mean 2.196

Mode 2.0

Median 2.141

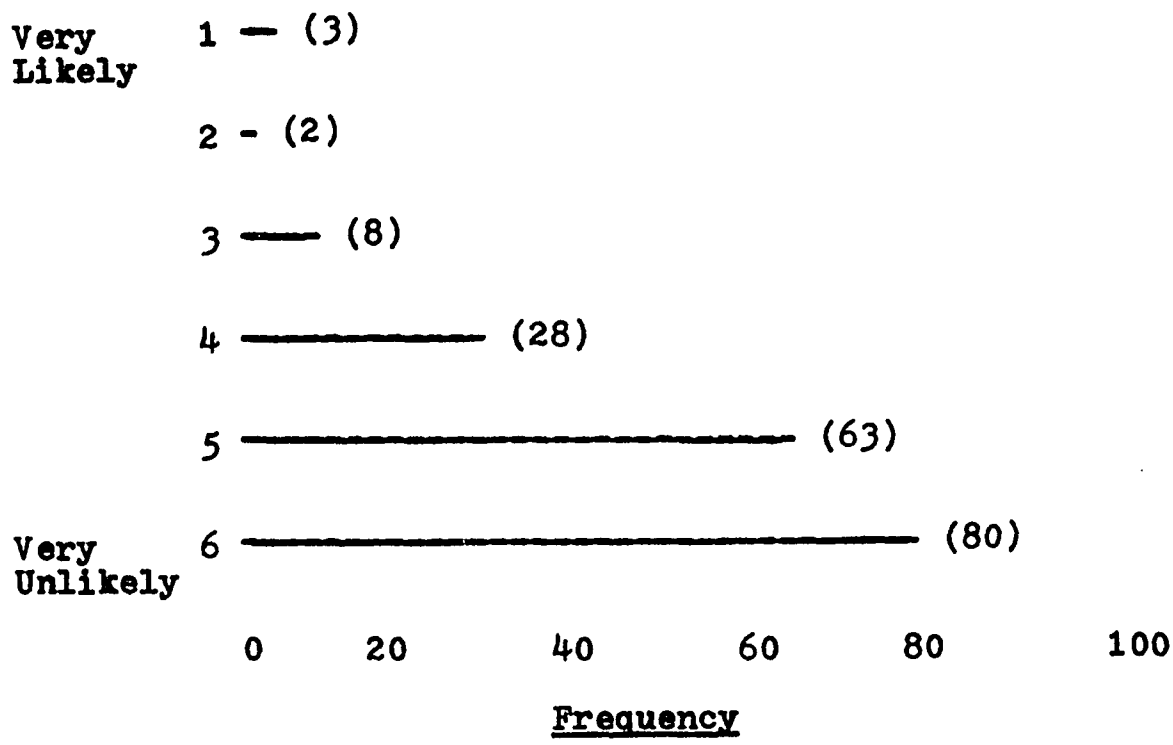
Variance 0.639

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item p - Avoidance



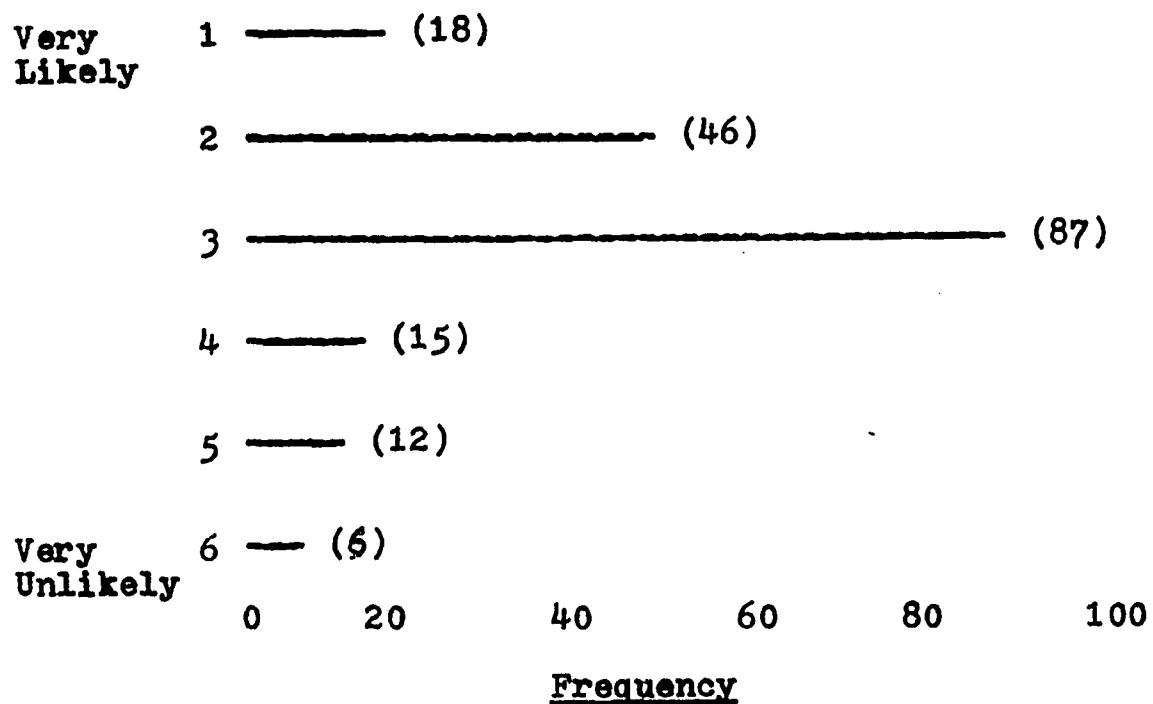
Mean 5.098
Mode 6.0
Median 5.310
Variance 1.116

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item q - Persuasion



Mean 2.864

Mode 3.0

Median 2.822

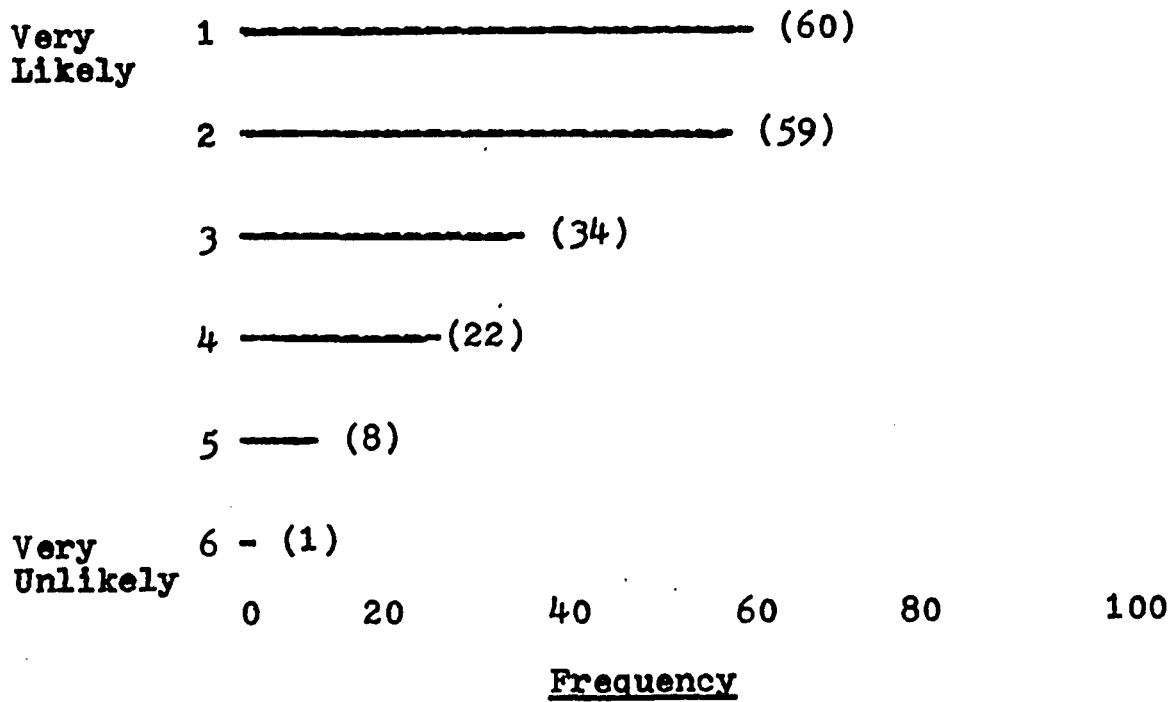
Variance 1.266

Note: n = 184

Parentheses indicate number of subjects

APPENDIX D - Continued

Item r - Problem Solving



Mean 2.250
Mode 1.0
Median 2.042
Variance 1.413

Note: n = 184

Parentheses indicate number of subjects

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