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I am submitting herewith a dissertation written by Barbara Jones Dyer entitled "The Impact of Strategy and Conflict Handling on Conflict Outcomes in the R&D/Marketing Interface." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration.

Dr. David J. Barnaby, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor
and Dean of The Graduate School

# THE IMPACT OF STRATEGY AND CONFLICT HANDLING ON CONFLICT OUTCOMES IN THE R&D/MARKETING INTERFACE

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Barbara Jones Dyer

May 1995

Thesis
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## DEDICATION

This dissertation is dedicated to

Dr. Carl L. Dyer

and

Mrs. Ruth Louden Jones

and

Mrs. Barbara Zeller Kyger

who have devoted their lives to education.

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## ABSTRACT

290 marketing and R&D managers from 188 electronic manufacturing firms participated in a survey that considered three major issues: 1) how firms pursuing unique strategies differ in their conflict handling mechanisms; 2) how conflict handling behaviors relate to constructive conflict outcomes; and 3) how constructive conflict outcomes affect new product success.

Findings indicate that conflict handling methods vary significantly between aggressive new product developers (Prospectors) and non-aggressive new product developers (Defenders). For example, aggressive firms have higher levels of integrative behaviors, while non-aggressive firms have higher levels of avoiding and forcing behaviors. Integrative conflict handling behaviors were found to be positively associated with constructive conflict, while forcing and avoiding behaviors negatively impacted positive outcomes. Finally, constructive conflict was found to be positively associated with new product performance.

It was concluded that managers could use an understanding of their firm's strategic position to help them manage conflict situations within the new product development process to improve new product success. Based on study results, ten managerial prescriptions for new product managers and their firms are presented.

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# CHAPTER 1

## Introduction

*The development and introduction of new products to the marketplace are vital to corporate profitability and growth. The companies most successful in carrying out these activities use approaches and techniques that, although only slightly different from those employed by their less successful competitors, result in significant performance advantages.*

*Booz-Allen & Hamilton, Inc.*
*Corporate Document, 1981*

## Overview

In today's highly competitive markets, innovations and relationship marketing stand out as effective corporate strategies to ensure firm survival in the marketplace. Business, however, can further improve competitive advantage by combining these two strategies--i.e., combining the concept of relationship marketing to the innovation loop *inside* the firm. Empirical studies show that the relationship of marketing and R&D, key functional areas in the innovation process, tends to be highly conflictful. Despite a strong research history, many questions remain to be answered about the *management* of the R&D-marketing relationship relative to the innovation process. This study looks at the question of behavioral and structural handling of conflict and its impact on R&D-marketing relationships and new product success. The importance of contextual factors, such as strategic position, are also considered.

For some time companies worldwide have engaged in an economic *Third World War*--their economic engagements taking place on multiple fronts, with multiple opponents and with dire consequences to growth, jobs and profitability. For the United States the result of these forays has

been less than satisfying. In the last three or four decades, the U.S. share of world gross national product has diminished to half what it was, and the U.S. share of world markets has dropped in value from 20 percent to approximately 10 percent (Lodge, 1987; Skinner, 1987).

At this point, the war is not totally lost. The United States still enjoys unquestioned leadership in certain markets, e.g., pharmaceuticals, forest products, and aerospace (...in particular, Europe's Airbus Industrie, jointly owned by four European countries, is challenging for dominance in the aerospace industry). The U.S. also enjoys solid leadership in world markets in chemicals, food, scientific and photographic equipment, petroleum refining and telecommunications equipment. For computers, industrial and farm equipment, motor vehicles, and metals, however, the story has been one of decline. For example, the U.S. consumer electronics industry has been very hard hit by Japanese competition, resulting in a trade deficit in this industry alone of $10 billion in 1990 (Kupfer, 1992).

The variation in performance among today's companies certainly involves a complex causal web. Two factors, aggressive innovation and relationship marketing, however, explain much of the variation in performance (Bleeke & Ernst, 1993). Historically, those industries embracing innovation and vigorously pursuing new products have tended to come out on top. In fact, innovation impacts company success for several notable reasons: 1) innovation drives the growth of economies, as established by Schumpeter (1934), e.g., innovation spurred the growth of the American economy in the 1950s and 1960s; 2) business analysts recognize innovation as a key factor in individual firm growth (Booz-Allen & Hamilton, 1981; Cooper, 1983; Little, 1984); and 3) slowing market growth in domestic and world markets positions innovation as one of the few viable growth options available to many firms (Booz-Allen & Hamilton, 1981; Lodge, 1987).

In addition to innovation strategies, relationship marketing strategies have also strongly impacted successful competition. Relationship marketing includes relational contracting, working partnerships, strategic alliances and a whole range of supplier partnerships, buyer partnerships, lateral partnerships and internal partnerships (Morgan & Hunt, 1993) (See Figure 1). In essence, relationship marketing defines itself as cooperation *within* a given network which leads to successful competition outside that network. Webster (1992, p.1) calls relationship marketing a new structure for firms in which the old hierarchical bureaucratic structures are exchanged for "networks of buyer-seller relationships and strategic alliances."

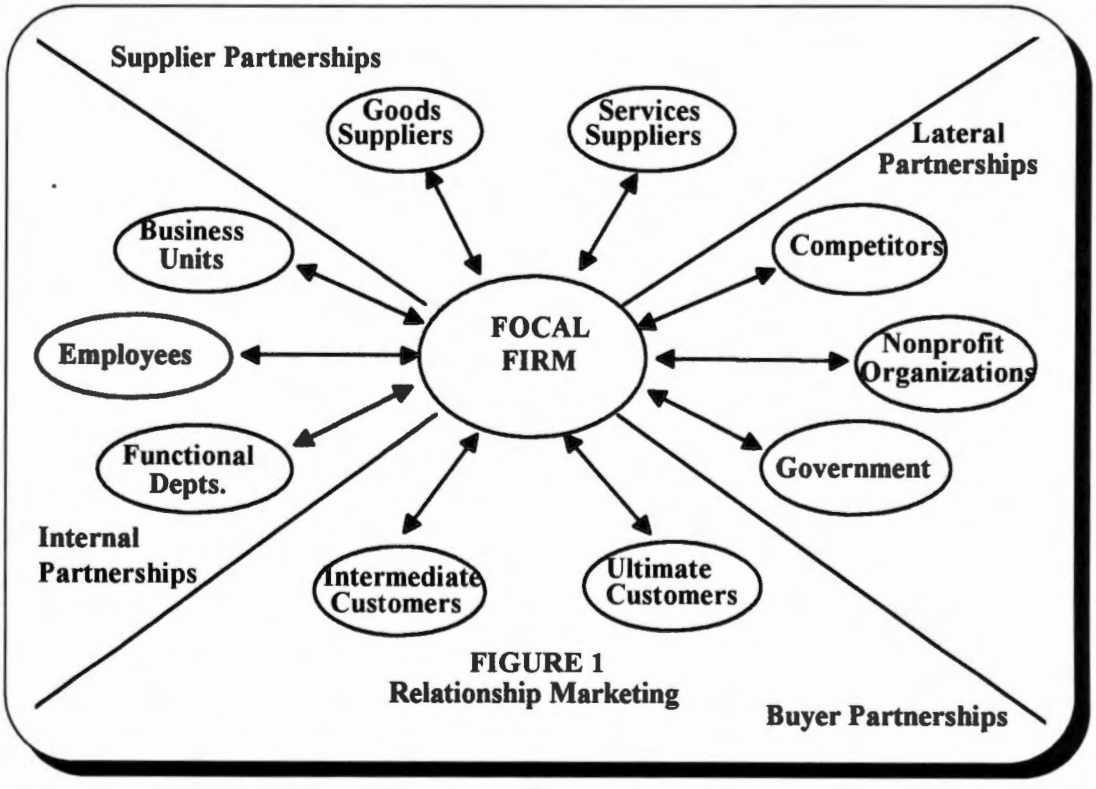



**FIGURE 1**
**Relationship Marketing**

Unfortunately, when statements are made about relationship marketing today, only part of the true potential of relationship marketing is accessed--the external part involving highly visible

strategic alliances. Those components falling under the heading of 'Internal Partnerships' and their accompanying productivity gains and competitive advantage potential are glossed over. Yet, we do not have to look far for evidence of the importance of internal partnering. Japanese business signaled its regard for the importance of internal partnering with a national standard, Z8101-1981 or "company-wide quality control," over a decade ago (Sullivan, 1986).

Under an internal relationship marketing model, the relationship which exists between areas such as marketing and R&D becomes paramount to new product development (Wind, 1981). Also under the current assumptions of relationship marketing, cooperation (as expressed by Morgan & Hunt, 1993) would be the goal. Simultaneously, however, organizational research suggests that a moderate level of conflict leads to better performance than a low level of conflict (Gray & Stark, 1988). These two points suggest that cooperation and conflict occur concurrently within organizations, and that our research should include efforts to better understand the appropriate levels and applications of cooperation *and* conflict in relationships.

Specifically within the R&D-marketing interface, research has established that marketing and R&D experience significant conflict in their relationships (Souder, 1981). Yet, there is no research looking at the use of cooperative and conflictful (competitive) approaches to managing conflict itself. This study looks at these issues by testing the impact of behavioral and structural methods of conflict management on constructive conflict and new product success. It is also considers how these styles are affected by different strategic scenarios.

Chapter One presents: 1) an overview; 2) an introduction to the study; 3) definitions of key terms in the research; 4) a statement of innovation's importance to the firm; 5) a statement of the importance of the interfunctional interface to innovation; 6) a statement of the importance of conflict management to the interface and 6) a summary. Chapter Two offers a general review and

model of conflict. Chapter Three proffers a review of the extant empirical conflict research within the R&D-marketing interface. Chapter Four presents a perceptual context model of conflict, research needs in the conflict area, and specific research hypotheses that probe the importance of context in conflict management.

## A Relationship Model of the R&D-Marketing Interface

A broad relationship model of the innovation process includes three primary areas within the firm: R&D, marketing and production. Of course, many other areas of the firm support the innovation effort indirectly, including top management, finance, accounting, and personnel (See Figure 2). These relationships involve both the hierarchical (vertical) structure and the lateral (horizontal) structure of the business. Although all of these relationships critically affect the efficiency and effectiveness of the innovation loop within the firm, this study will confine its attention to the lateral relationships between R&D and marketing.

In order to discuss the relationships between R&D and marketing, it is important to see the kinds of interdependence that make up this component of the innovation loop. Cooper (1979) provided the seminal empirical work clarifying the interface's activities. He began with 77 variables which previous literature indicated to be related to new product outcomes. By factor analysis Cooper reduced the original 77 variables to 18 dimensions describing new product projects. These dimensions included what he called technical, marketing and evaluative activities.

Gupta (1984), based on a literature review of new product development, identified 19 activities that R&D and marketing jointly carry out over the course of a new product development project. Using these 19 activities to investigate managers' feelings about the integration of new product development activities, Gupta, Raj and Wilemon (1985) questioned R&D and marketing managers from 331 high-technology firms. Song and Parry (1992) based their survey of Japanese

R&D and marketing managers on Gupta's interfunctional activities, reducing them to three dimensions by factor analysis.

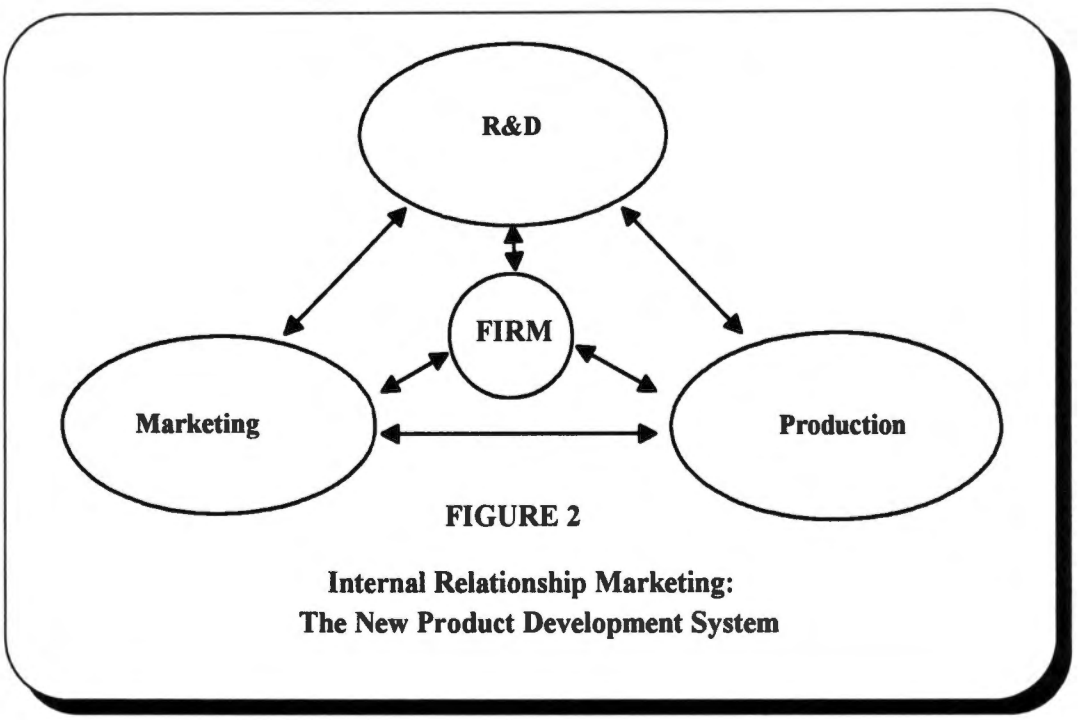



**FIGURE 2**

**Internal Relationship Marketing:**
**The New Product Development System**

Based on the above empirical findings and the concept of internal relationship marketing, this study conceptualizes the R&D-marketing interface relationship in terms of the activities which transpire between the two areas and the nature of the actions which take place in carrying out these activities (See Figure 3).

## The Conflict/Cooperation Paradigm

An association exists between conflict and cooperation that bears heavily on research efforts in either area. One view of this association is that conflict and cooperation are polar opposites, in part because they do not occur simultaneously in a given interaction. We would

portray such a relationship between conflict and cooperation as opposite ends of a continuum (See Figure 4).

The "continuum" model of conflict and cooperation reflects the traditional good-bad view of the constructs. Several problems exist, however, with viewing cooperation and conflict in this way. The first problem is the level of analysis. With this model, conflict and cooperation are analyzed only at a given point in time and within a single interaction. This level poses problems, because in reality we experience conflict and cooperation in organizations as episodes in on-going

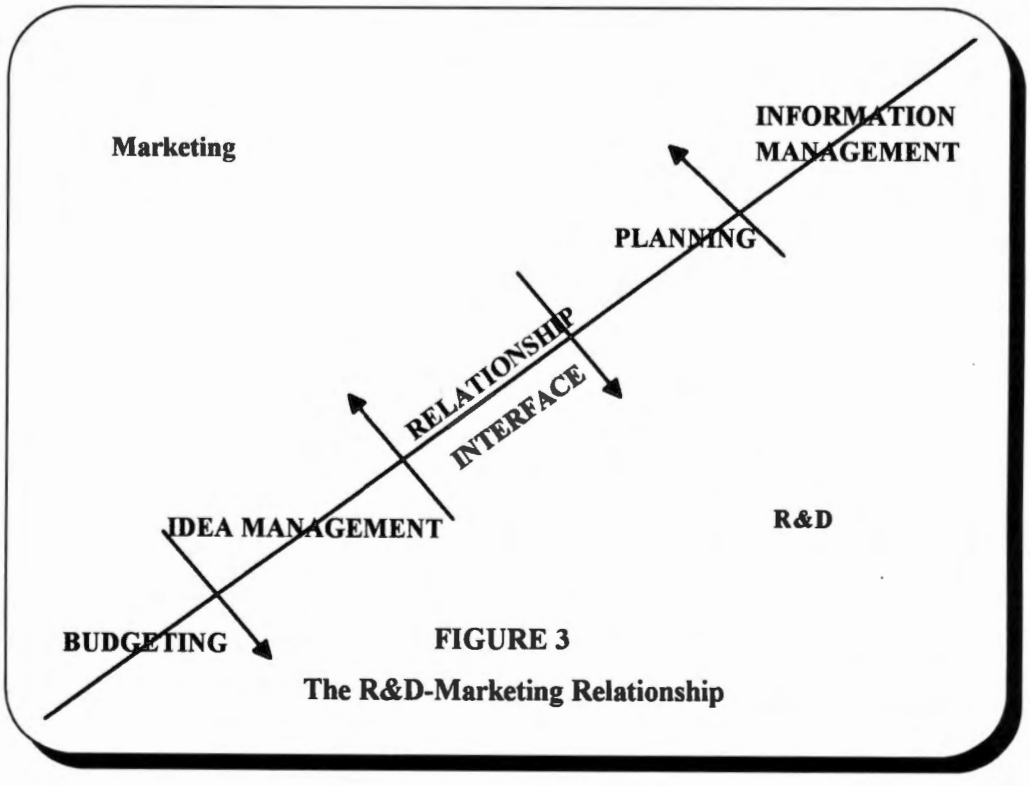



**FIGURE 3**

**The R&D-Marketing Relationship**

relationships (Pondy, 1967). These relationships occur over time and involve multiple interactions. The second problem with the "continuum" model is its characterization that cooperation and conflict produce only unidimensional and opposed outcomes. Research has shown, however, that

cooperation and conflict each generate multiple outcomes--both positive and negative (See Figure 4).

Another view of the conflict/cooperation association involves an "episodic" approach. In 1967 Louis Pondy presented arguably the most commonly held paradigmatic view of conflict (Lewicki, Weiss & Lewin, 1992). His model is termed an episodic conceptualization, i.e., conflict occurs in episodes which involve antecedent conditions, latent conflict, perceived conflict, manifest

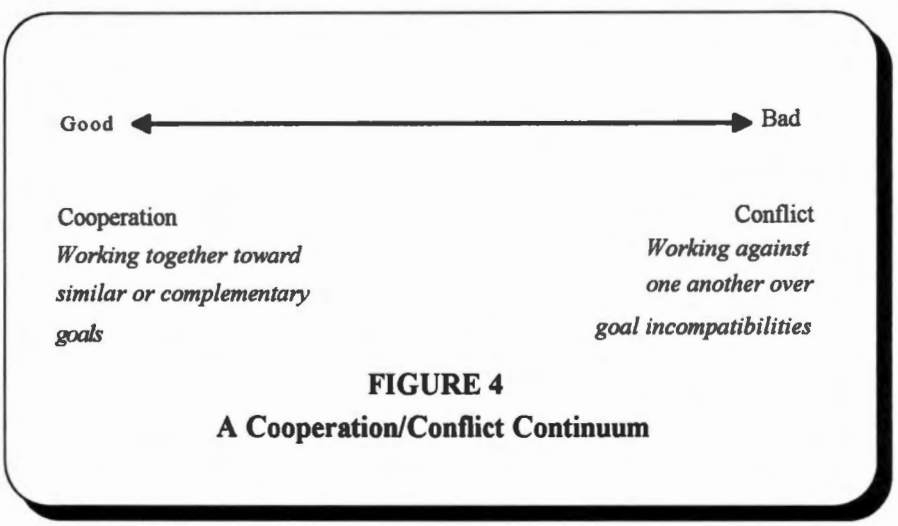



**FIGURE 4**
**A Cooperation/Conflict Continuum**

conflict and an aftermath. Underlying Pondy's episodic view is the assumption that organizations are primarily cooperative endeavors, in which outbreaks of conflict occur. Thus, Pondy irrevocably tied conflict to a cooperative framework within the business organization.

The idea of the organization as a cooperative endeavor has been with us since early in the development of organizational theory. In particular, Chester Barnard (1938) eloquently expressed the commonly held view that the organization exists as a cooperative endeavor. Defining cooperation as the social function which allows human beings to overcome their biological limitations, Barnard posed formal organizations as conscious, deliberate and purposeful attempts

at cooperation. He noted, however, in his introduction to *The Functions of the Executive* that successful cooperation is not the normal condition in the formal organization. Instead, he points to surviving firms as few in comparison to "innumerable failures" (Barnard, 1938, p. 5). Thus, conflict and cooperation flourish side by side within the organization.

Interestingly, Louis Pondy (1992), twenty years after he introduced his "episodic" model changed his view of the association which exists within organizations between conflict and cooperation. He states (p. 259):

> *Cooperation is too fragile and fleeting, purposiveness is too elusive, conflict is too frequently and too intensely directed at the very foundation of relationships for a model of benign, episodic conflict to be a valid representation of normal reality.*

Pondy's new model of organization presents conflict as the justification of the organization's existence. Cooperation becomes the episodic occurrence. He states that the organization as a pure conflict system perfectly predicts the garbage can model of Cohen, March and Olsen (1972).

Whichever model one imposes, however, conflict and cooperation are consistently paired within the organization. This research makes the point that conflict and cooperation are not meaningful to us as polar opposites, but rather as two omnipresent forces which operate within organizations--each capable of producing positive and negative outcomes. The independent variables in the study form a good example of the importance of understanding the relationships between cooperation and conflict. Blake and Mouton (1964), and the researchers who followed them, developed conflict management styles based on a tension between cooperation and competition (a special case of conflict). Thus, these styles based on cooperation and competition allow us to resolve conflict.

## The Nature of Conflict

Conflict, as a research construct, has traveled a long road and has encountered a clear dichotomy in approach. First, there is the "bad conflict paradigm" which dominated organizational thinking and research from the beginning of this century to its middle. Then, there is the "good conflict paradigm" which has been growing in strength the last few decades. From the beginning of the twentieth century until the 1930s or early 1940s most researchers viewed conflict under the aegis of the first paradigm. This viewpoint focused on the dysfunctional outcomes of conflict---such as the bitter labor-management disputes witnessed by the public into the 1930s.

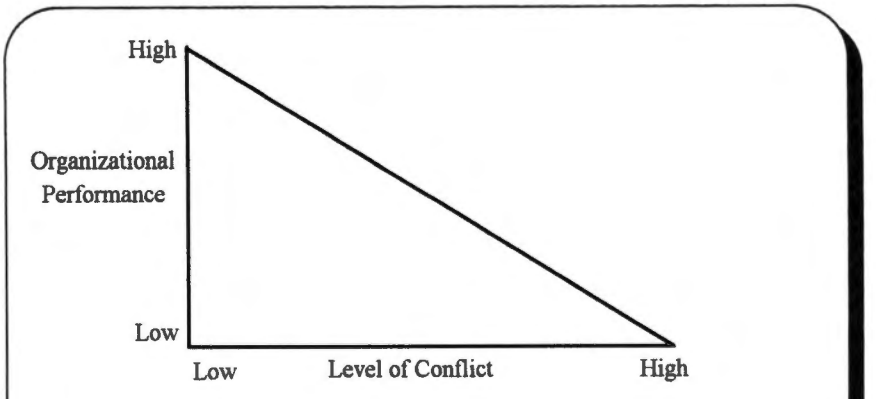



**FIGURE 5**
**The Traditional View of Conflict**

Source: Organizational Behavior by Gray & Starke, 1988, p. 539

The expectation of dysfunctional outcomes in organizational conflict carried with it the underlying assumption that conflict would lead to decreased performance for the organization (See Figure 5). Thus, researchers concentrated on research that would help organizations reduce or eliminate conflict. For example, Gray and Starke (1988, p. 538) in discussing this reduction/elimination

initiative in organizations, also state that in the traditional approach (conflict as negative) "the most general reaction was to suppress it (conflict)."

By post World War II, a mixture of views on conflict began to appear. Robbins (1974) suggested three philosophies reflecting managerial thinking on conflict: traditional, behaviorist and interactionist. The first posed that all conflict should be eliminated. The second posed that conflict was inevitable and should be accepted. The third posed that conflict should be proactively sought as well as resolved. Robbins pointed out that most researchers in the 1970s viewed conflict from the perspective of the first philosophy, but that sentiment was changing toward a more positive view of conflict.

More recently, as our century draws to a close, researchers have fulfilled the prophesy of Robbins (1974) and moved to an approach that incorporates more of his "interactive" perspective. These researchers judge conflict as inevitable, but resulting in positive *and* negative outcomes (Thomas, 1976; Tjosvold, 1989). The relationship between conflict and performance under the new paradigm becomes a convex function (Pondy, 1967) (See Figure 6).

It is critical to point out, however, that despite the shift in thinking among researchers, many people in the populace at large and among business managers in general still tenaciously hold the traditional view of conflict--i.e., the negative view. This is deeply ingrained in the American population: 1) through discouraging "fighting" within families; 2) through rewarding students on the basis of accepting and repeating the received view in our schools; 3) through valuing peace without also emphasizing the value of conflict in our religious institutions; and 4) through emphasizing hierarchical authority over expertise and creativity at lower levels in our corporations.

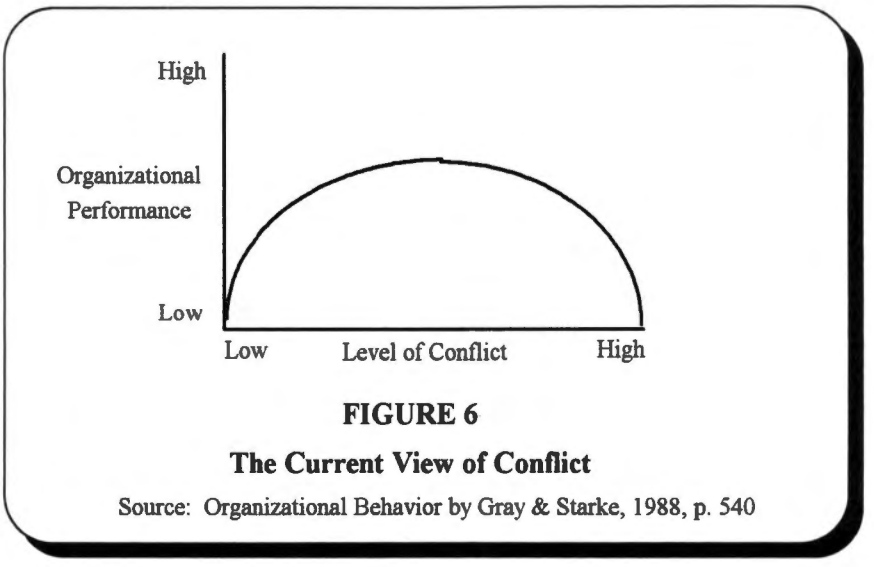



**FIGURE 6**

**The Current View of Conflict**

Source: Organizational Behavior by Gray & Starke, 1988, p. 540

## Key Definitions

"Conflict," as a term within various literatures, including management and marketing actually describes a whole range of dimensions surrounding the social process of conflict. Thus, "conflict" has been defined variously using an emotional approach, a cognitive approach, a goal (means/ends) approach, a behavioral approach, and an antecedent approach--to touch on only a few ways of defining conflict. While this plethora of definitions has, from one perspective, muddied the conflict construct, it has also helped to clarify the rich multi-dimensional nature of social conflict. As Pondy (1967, p. 298) suggested, to decide that any one of these dimensions alone sums up conflict is "likely to result in an empty controversy." Nonetheless, for the purpose of any given study the goals of science demand a definition which will delimit, develop, and operationalize the construct of interest (See Table 1).

Some conflict definitions sound punitive in nature, i.e., Coser's (1956, p. 8) definition: "a struggle over values and claims to scarce status, power, and resources in which the aims of the opponents are to neutralize, injure, or eliminate their rivals." Some definitions, such as that of

**TABLE 1**
**Selected Definitions of Organizational Conflict**

| Author | Definition |
|---|---|
| Coser (1956) | "a struggle over values and claims to scarce status, power, and resources in which the aims of the opponents are to neutralize, injure, or eliminate their rivals." |
| Thomas (1976) | "...the process which begins when one party perceives that the other has frustrated, or is about to frustrate, some concern of his." |
| Bennis, Benne & Chin (1969) | "Conflict may connote animality, violence, destruction, barbarization, loss of civilized control, irrationality. Alternately, conflict may connote adventure, novelty, clarification, creation, growth, dialectical rationality." |
| Pondy (1967) | "Conflict is a dynamic process which can describe the antecedent conditions of conflictful behavior, the affective states of those involved, the cognitive states of those involved or the resultant behavior, ranging from passive resistance to overt aggression." |
| Simmel (1905) | "Conflict is the social process which resolves the tension between contrasts." |
| Robbins (1974) | "Conflict is opposition or antagonistic interaction based on scarcity of power, resources or social position and differing value structures." |
| Morgan (1986) | "Conflict arises whenever interests collide." |
| Deutsch (1969) | "Conflict exists whenever incompatible activities occur." |

Bennis, Benne and Chin (1969) present a more balanced approach: "Conflict may connote animality, violence, destruction, barbarization, loss of civilized control, irrationality. Alternatively, conflict may connote adventure, novelty, clarification, creation, growth, dialectical rationality."

For the purposes of this research, conflict will be conceptualized in the following manner:

> *Conflict arises whenever the goals of one person or group are incompatible with those of another person or group--and one person or group interferes with the other person or group with the express intention of denying the other's goal achievement.*

Also, the study will restrict itself to task-related conflict. It will not deal with emotional conflict, or what researchers call personality conflicts.

The literature has also defined cooperation in multiple ways (See Table 2). The various research literatures have called cooperation organizational interdependence, component interdependence, cooperation, exchange, and concerted decision making (Schermerhorn, 1975). MacIver (1937) divides cooperation into two types: cooperative means and cooperative ends. His characterization suggests that common means cooperation is fragile and contingent, while common ends cooperation has great strength and durability.

Also, cooperation has often been paired with competition in the literature. This stems from their relationship to goal attainment. Although it is tempting to think so, cooperation and competition are not opposites. Between the cooperation/competition literature and other cooperation research, many definitions of cooperation have developed over the decades. Axelrod (1984) defines cooperation as the norm of reciprocity, a folkway which involves helping out a colleague and having the favor returned. This definition is the social counterpart to Barnard's corporate definition. Certainly, just as in the case of conflict, cooperation has garnered many definitions.

**TABLE 2**
**Selected Definitions of Cooperation**

| Author | Definition |
|---|---|
| May & Doob, 1937 | "...competition or cooperation is behavior directed toward the same social end by at least two individuals. In competition, moreover, the end sought can be achieved in equal amounts by some and not by all of the individuals thus behaving; whereas in cooperation it can be achieved by all or almost all of the individuals concerned." |
| Barnard, 1938 | Cooperation as it occurs in organization represents the synthesis of collective need and individual free will. Persistence of cooperation depends on accomplishing a common purpose and on a satisfactory level of motivation for the individuals participating. |
| Deutsch, 1949 | "In the cooperative social situation the goals for the individuals or sub-units in the situation under consideration have the following characteristic: goal regions for each of the individuals or subunits in the situation are defined so that a goal region can be entered to some degree by any given individual or subunit only if all the individuals or subunits under consideration can also enter their respective goal regions to some degree." They are "promotively interdependent goals." |
| Axelrod, 1984 | Cooperation is defined as the norm of reciprocity. Reciprocity is a "folkway which involves helping out a colleague and getting repaid in kind." |
| Wiener & Doescher, 1991 | Cooperation is the equivalent of "selling brotherhood." The latter is defined as "using a mass communication strategy to induce individuals to take actions when the actions are associated with low benefit-cost ratios." |

This study will define cooperation in the following manner:

> *Cooperation arises whenever the goals of one person or group are compatible with those of another person or group--and one person or group works with the other person or group with the express intention of assisting the other's goal achievement.*

For the purpose of clarifying background assumptions, conflict and cooperation will be defined from a relationship perspective. Therefore, breaking with the literature (which has tended to view conflict and cooperation as related to a single incident), this study defines the two constructs in the following manner:

> *A conflictful relationship is one in which: 1) a person or group works to block the other's goals; 2) members of the relationship perceive it as conflictful; and 3) cooperation is episodic.*
>
> *A cooperative relationship is one in which: 1) a person or group works together to achieve the same or complementary goals; 2) members of the relationship perceive the relationship as cooperative; and 3) conflict is episodic.*

Although this study will not endeavor to study cooperative versus conflictful relationships directly, it is critical that the conceptualization and assumptions about the relationship of conflict and cooperation be clear. Such positions affect the inferences drawn. Also, the conflict behavior styles which will be studied in this research rest heavily on the relationship of these two constructs.

## Conflict Behavior Styles

This study defines the conflict behavior styles of forcing, accommodating, compromising, integrating and avoiding as follows:

1. Forcing. This conflict handling style reflects low cooperativeness and high assertiveness. Thus, one party maximizes his own concern at the expense of the other party.

2. Accommodating. This conflict handling style reflects high cooperativeness and low assertiveness. Thus, one party acquiesces to the wishes of the other party.

3. Compromising. This conflict handling style reflects moderate cooperativeness and moderate assertiveness. Thus, both parties give and take, gaining partial fulfillment of both concerns.

4. Integrating. This conflict handling style reflects high cooperativeness and high assertiveness. Thus, both parties maximize both of their concerns through high cooperation.

5. Avoiding. This conflict handling style reflects low cooperativeness and low assertiveness. Thus, both parties involved in the conflict avoid or ignore all concerns.

## Innovation, the Interface, and Conflict

Industrialized countries face a future in which domestic markets are shrinking, many products are maturing and foreign competition looms large. As a result, more and more companies in these countries pursue new product development as the answer to success in the world marketplace (Cooper, 1983). For example, a major world trade competitor is Japan. Japan is a nation committed to innovation. This commitment shows in the interactive cooperation of Japanese firms, government and universities that has been called their "innovation web" (MacDowell, 1984). The result is that Japanese firms currently surpass American firms in their efforts to bring new products to the marketplace (Dentzer, 1990).

The possible risks surrounding new product innovation are as well known as the possible successes. Firms can spend years and millions of dollars on products that never make it to the market or, once there, end on the heap of new product failures (Lamb, Hair & McDaniel, 1992; Boone & Kurtz, 1992). In fact, researchers frequently present new product failure rates to be as high as 50 to 90 percent (Cooper, 1983). Although this range may be excessive, Hopkins and Bailey (1971) found a 40 percent failure rate among consumer goods, and Hopkins (1980) reported the failure rate for industrial new products to be approximately 35 percent.

Despite the failure rate of new products, many global "players" take the innovation leap again and again. In truth, given the fierce nature of competition world-wide, Japanese firms must.

All competitive firms must. Ultimately new products are the only path to survival in the long term (Cooper, 1983). As Little (1984, p. 60) states:

> *A major challenge faces the world's largest corporations: innovate or fail to survive as a company.*

When our closest competitors are employing innovation strategies, and innovation is the road to economic survival, the message stands clear. America must improve its innovation capabilities.

It has been clearly determined, given today's highly competitive markets, that speed and flexibility are critical to innovate successfully (Lucas & Bush, 1988). This implies that functional areas do not have the time for sequentially doing their work. What is needed is a "rugby-type," interactive approach to the new product development process which will speed work and maintain needed flexibility, i.e., internal relationship marketing (Takeuchi & Nonaka, 1986). Additionally, the demand for both product superiority and an excellent product/market fit points to the criticality of cooperation among key functional areas for a successful new product development process (Bonnet, 1986; Norton, Parry, & Song, 1994; Ruekert & Walker, 1987; Song & Parry, 1991, 1993; Souder, 1981; Wind, 1981). Bonnet (1986, p. 118) states "...the degree of integration between R&D and marketing is strongly correlated with the degree of industrial product success."

Historically, new product development research, i.e., the interfunctional interface literature, centered its efforts around the source of the product innovation process. Some researchers took the position that the source of innovation is a market-pull--that consumer wants and needs drive the new product development process (Utterback, 1974). Under this scenario the R&D-marketing interface justified its importance, since marketing was the repository in most firms of consumer data, demanding transfer of the data across the interface. Other researchers, however, took the position that the source of the product development process was technology-push. Under

this scenario the importance of the interface between the two departments became logically less justifiable.

Kiel (1984) dismissed the idea of choosing one perspective over the other. He argued that maintenance of the interface is crucial to successful new product development since firms will be dealing with both R&D and marketing, depending upon the nature of the particular new product project currently being promoted. In support of this position, Bonnet (1986) in a study of 10 British technology manufacturing firms found that a strong interface was just as crucial in technology-push instances as in market-pull ones.

In conclusion, despite the criticality of the interaction of the R&D and marketing functions to the product innovation process, research on the interface has developed only in the last fifteen to twenty years (Gupta, Raj & Wilemon, 1986; Hutt & Speh, 1984; Song & Parry, 1992, 1993). Yet, the importance of integration mechanisms to firm performance in general was established in the classic Lawrence & Lorsch (1967) differentiation/integration study. Today, it is common knowledge among researchers that management of functional interfaces involved in new product development is critical to innovation success (Lucas & Bush, 1988).

Early in the interfunctional interface literature, Souder (1977) posed that a lack of integration between R&D and marketing might comprise a barrier to successful new product development. He followed this with a study of 38 Industrial Research Institute member firms, conducting 312 in-depth interviews with 150 randomly selected R&D projects (1980). He found in measuring cooperation between the two functional areas that four problems with the interface recurred--a pattern. This pattern was described as: 1) lack of communications, 2) lack of appreciation, 3) distrust, and 4) too-good friends. Most interesting is the impact of those problems on new product development. "Too good friends," "lack of communications," and "lack of

appreciation" resulted in decreased effectiveness of the resulting product. "Distrust" resulted in 88.3% of the projects being canceled by top management for failure to make progress.

By the middle of the 1980s, and in response to the work of William Souder, the necessity of good on-going relations between functional areas had become, in essence, "traditional wisdom" within the interface literature (Gupta, Raj & Wilemon, 1985). In 1986, Gupta, Raj and Wilemon developed the first conceptual framework for the study of the R&D/marketing interface relative to the product innovation process. With increasing research on the interface, researchers no longer sought to justify its importance, but turned instead to analyze how the integration between functional areas worked. Song and Parry (1991, 1992, 1993) substantially enriched the interface literature and extended it beyond American firms by researching key integration questions in the Japanese new product development process. However, William Souder alone among these researchers strongly pursued the question of conflict between functional areas. Conflict questions were included as a secondary research issue, an afterthought, in most studies. The importance of managing conflict in the interfunctional interface was considered settled.

**Summary**

Both the impact of innovation and relationship marketing on economic growth and on competitive advantage in global markets earmarks them as critical organizational strategies. It is incumbent upon American industry and organizational researchers to explore every possible avenue of innovation improvement. Combining internal relationship marketing and innovation represents one such avenue. However, this combination highlights the conflictful relationship which traditionally exists between R&D and marketing. Process research would help companies to better manage the relationships found in an inherently conflictful new product development process.

Fortunately, just as there is strong evidence that U.S. manufacturers and their suppliers are moving from a short-term view of their interactions to one of long-term relationships, evidence also indicates strong support for well managed relationships between the functional areas involved in innovation (Souder, 1981). The hope is that such alliances across the borders of our functional areas will garner at least some of the same competitive advantage that cross-border strategies have in global trade (Bleeke & Ernst, 1993).

Chapter 2 will present: 1) a general review of the conflict literature from a sociological perspective and 2) a general model of organizational conflict.

# CHAPTER 2

## A General Review and Model of Conflict

*Contrariety is expedient, and that the best agreement arises from things differing, and that all things come into being in the way of the principle of antagonism...*

*Heraclitus*
*Nichomachean Ethics, VIII, 1, 1155a, 32.*

### Sociological Conflict

Theories of conflict developed over a long period of time and in a wide variety of disciplines: social science, religion, ethics, politics and philosophy (Fink, 1968). Indeed, conflict's lineage covers multiple cultures and centuries, e.g., Kautilya's (a Hindu Brahman in the fourth century B.C.) Arthashastra, Heraclitus of sixth century Greece, Ibn Khaldun of fourteenth century Tunisia, Niccolo Machiavelli of sixteenth century Florence, as well as other major contributors (Porter, 1982). In more recent centuries great Western minds such as Hegel, Hobbes, Locke and Mill have contributed to our thinking about conflict in society.

Conflict can trace its modern sociology to the 19th century (Fink, 1968). Here, thinkers included conflict as a major explanatory variable, but applied the phenomenon to specific instances within society. For instance, Marx's theory of social class conflict, Darwin's theory of species competition and Freud's theory of conflict between id, ego and superego illustrate such applications (Deutsch, 1980). By the end of the nineteenth century, however, broader, more general theories of conflict began to appear in the physical sciences, biology and the social sciences. Concurrent with conceptual activity about conflict, definitions began to appear and diverge. Thus, conflict, like many research constructs, enjoys a variety of definitions.

General theories dealing with the sociological process of conflict in human society developed within the last century. Tarde, Simmel, and Carver all developed general conflict theories (Fink, 1968). Of these three scholars, Simmel, one of the giants of sociology along with Weber and Durkheim, strongly influenced conflict research (Porter, 1982). The quality of his conceptualizations and his impact upon Lewis Coser's work in the 1950s carried his ideas from Europe into American sociology. Coser studied Simmel's 1905 work, Conflict, and generated sixteen research propositions based on Simmel's conceptualizations. The acceptance of these propositions reveals itself in the now generally accepted negative and positive outcomes of conflict (Gray & Starke, 1988).

In summary, researchers and others have pursued greater understanding of conflict through multiple avenues. Within academia the disciplines of psychology, sociology and economics have focused respectively on interpersonal, intergroup and economic analysis conflict issues, while the business and political arenas have concentrated on labor relations, bargaining and negotiation, and third party resolution (Lewicki, Weiss & Lewin, 1992). This study approaches its conflict questions largely from a sociological and organizational behavior point of view.

## The Connection of Conflict and the Organization

Organizational conflict research draws strongly upon the conflict literature in sociology, because organizations are social systems (Katz & Kahn, 1966). If conflict is a major variable in social groups, it follows that it is a major variable in organizations. Conflict is, in fact, a social variable and a pervasive process in both our society and our organizations (Boulding, 1964). As Hall states: "organizational conflict is inevitable" (1991, p. 132), a persistant factor in organizational life.

To gain a better perspective on the importance of conflict to modern society and organizations, it is interesting to consider the relative role which organizations play in society today. Although organizations represent just one part of our social institutions, they represent the *dominant* social institution (Clark, 1988). We have become what Presthus (1978) calls the "organization society." A hundred years ago conflict, as a natural social process, impacted primarily personal relationships, families and small organizations. Today it impacts relationships in large organizations--predominantly the work place.

From the point of view of academic research, Lawrence & Lorsch (1967) admirably demonstrated the value of conflict management to the bottom line in their seminal work on differentiation and integration. Conflict management, properly handled, proved to have a direct and positive impact on firm effectiveness and performance. From the point of view of the practitioner, Rahim (1986) reported that a study by Thomas and Schmidt found managers spend as much as one-fourth of their time handling conflict, and that it is one of the areas in which they most desire additional training. To compound this, Clark (1988, p. 154) reports that conflict management is now more crucial because "the frantic search for excellence and improved ratings all may be feeding the fires of organizational conflict partially at the expense of the rules of competition."

A major issue in organizational conflict research has been the adoption of a positive or negative perspective. The research has experienced a full circle in its journey through time--from positive perspective to negative perspective to positive perspective again. Conflict research in sociology during the early part of the century viewed conflict as a positive force and the central explanation of social change and progress (Coser, 1956). With the advent of the Human Relations school, conflict became "bad." The new goal became elimination of conflict. For

instance, conflict's characterization by Kolb (1983) as a "stubborn fact" of organizational life stems from a generally held view of conflict as something negative and in many instances unpleasant. In short, one should avoid conflict (Daft, 1986). This general state of avoidance shows in the relative dearth of quality management research and literature on the topic in the last 30 years (Hall, 1991). Price and Mueller's recent book Handbook of Organizational Measurement (1986) devoted one chapter (two pages in length) to the measurement of conflict with the sad conclusion that there are no acceptable measures of conflict yet proposed.

In recent years, many organizational conflict researchers, among them Deutsch, Kilmann, Rahim, Thomas and Tjosvold, have returned to the original positive perspective. These researchers have looked at the constructive aspects of conflict within organizations. Tjosvold (1991) presents the idea of the "conflict-positive" organization--an organization that values diversity, seeks mutual benefits, empowers its employees and looks proactively at how it manages conflict. Tjosvold poses that the organization has three alternatives: 1) positive conflict; 2) negative conflict; and 3) avoidance of conflict. Only the first, according to Tjosvold, is "managed" conflict.

## Models of Conflict

Pondy (1967) presented a process model of conflict that has dominated the conflict literature since its introduction several decades ago. He identified three major classes of conflict (conflict among interest groups, superior-subordinate conflict and lateral or interfunctional conflict) and presented a conflict process that takes place in the same fashion within each of the major classes of conflict. Pondy, using a systems perspective, conjectured conflict as the mechanism providing feedback necessary for the organization's ultimate stability. The model

pioneered a process approach, the blending of latent and manifest aspects of conflict, and the joining of personal experience and organizational interaction.

Lewicki, Weiss and Lewin (1992) present an excellent review of models developed in the conflict literature (See Table 3). They divide conflict models into descriptive and normative classifications. Under their schema, descriptive models address the causes and dynamics which typify conflict, and normative models address the resolution of conflict. Lewicki summarizes the models by stating that normative models developed either before or simultaneously with descriptive models--indicating a general lack of empirical foundation for many of the normative efforts. Also, although Lewicki identifies nine models, these nine, in fact, represent only five unique approaches: 1) conflict behavior approaches (Rapoport, 1960); 2) stage approaches (Pondy, 1967; Filley, 1975; Thibaut & Walker, 1975; Sheppard, 1984; Walton, 1969); 3) structural approaches (Thomas, 1976); 4) managerial response approaches (Blake & Mouton, 1964, 1978; Ruble & Thomas, 1976; Pruitt & Rubin, 1986; Likert & Likert, 1976); and 5) negotiated expectations approaches (Blake & Mouton, 1985).

As is apparent from the models presented by Lewicki, et al. (1992), the modeling of conflict varies considerably. Most of the conflict models focus on some part of the conflict process rather than trying to encompass all of it. For the purposes of this chapter, the author presents a modification of a general model of conflict taken from the organizational behavior literature (Gray & Starke, 1988). The model presented here gives a process view of the conflict concept, tying the causes of conflict to conflict handling and finally to the nature of conflict's outcomes. The model typifies organizational behavior models in that considerable emphasis is placed upon conflict behavior management. It differs from the traditional organization behavior models in clarifying the connection between conflict causes and the organizational goals that

**TABLE 3**
**Models of Conflict**
**(Lewicki, Weiss & Lewin, 1992)**

| Name of Model | Type of Model | Author(s) | Description |
|---|---|---|---|
| Fight Model | Descriptive | Rapoport, 1960 | Describes interpersonal aggression |
| Debate Model | Descriptive | Rapoport, 1960 | Describes cognitive conflict caused by differing ideas, values, ideologies or policies |
| Stages of Conflict Model | Descriptive | Filley, 1975<br>Thibaut & Walker, 1975<br>Sheppard, 1984 | Describes a process expanding Pondy's work |
| Dual Concerns | Descriptive | Ruble & Thomas, 1976<br>Pruitt & Rubin, 1986 | Describes resolution styles based on assertiveness and cooperativeness |
| Structural Model | Descriptive | Thomas, 1976 | Describes structural determinants of conflict behavior |
| Conflict Grid Model | Normative | Blake & Mouton, 1964, 1978 | Prescribes managerial responses to conflict based on concern for production versus concern for people |
| Conflict Cycles Model | Normative | Walton, 1969 | Prescribes intervention strategies for interpersonal conflict |
| Systems 1-4 Model | Normative | Likert & Likert, 1976 | Prescribes the System 4 style--a highly proactive cooperation approach |
| Interface Conflict-Solving Model | Normative | Blake & Mouton, 1985 | Prescribes a six-step action-oriented process of resolution for groups who work together frequently |

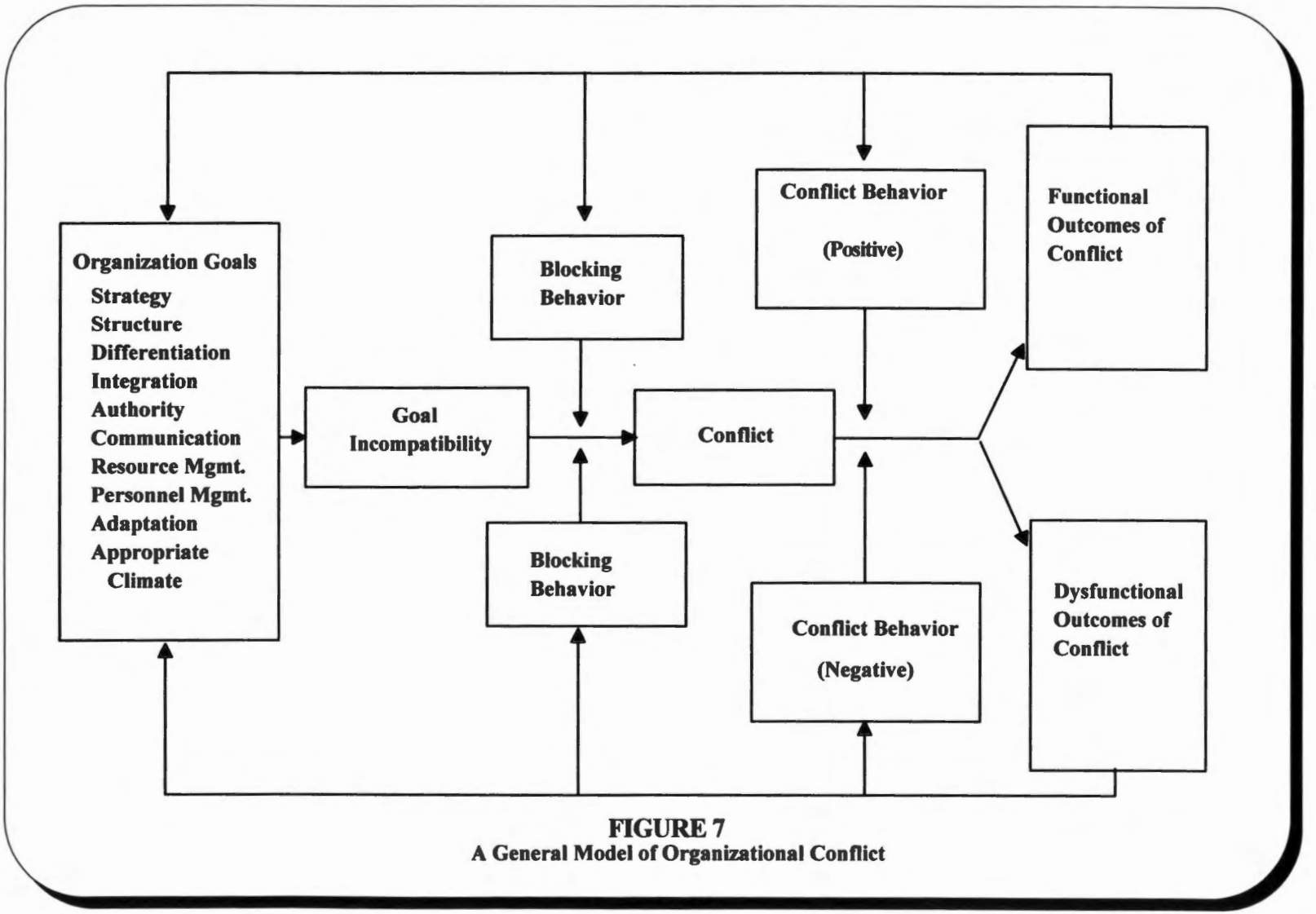



**FIGURE 7**
**A General Model of Organizational Conflict**

sources of organizational conflict into three kinds of conflict: 1) resource scarcity conflict; 2) autonomy effort conflict; and 3) goal conflict. A review of the literature indicates surprising commonality among researchers about general causes of conflict: 1) competition for resources; 2) communication problems; 3) interdependence of tasks; 4) authority issues such as power, status and clarity of authority lines; 5) value differences caused by differentiation; and 6) personnel issues such as skills and traits (Gray & Starke, 1988; Landsberger, 1961; Lewicki, Weiss & Lewin, 1992; Pondy, 1967; Miles, 1980; Walton & Dutton, 1969; Walton, Dutton & McCafferty, 1969).

An inconsistency does exist in the literature on the positioning of conflict causes, however. Although organizational behavior research defines conflict around the achievement of goals, it presents causes without attaching them to goals. Thus, researchers fail to express the root drivers of conflict, the underlying organizational goals over which goal incompatibility arises. For clarification of this connection, the model has grouped such "causes of conflict" as jurisdictional ambiguities (Miles, 1980), unclear authority structures and power asymmetries (Gray & Starke, 1988), and efforts to achieve autonomy (Lewicki, Weiss & Lewin, 1992) under the broader organization goal of authority. Likewise, task interdependencies (Miles, 1980), interaction rate and differentiation (Walton & Dutton, 1969) can be grouped under the broader goal of differentiation and so forth.

Recognized general organizational goals, then, include strategy, structure, differentiation, integration, authority, communication, resource management, personnel management, adaptation and climate management (Barnard, 1938; Chandler, 1960; Hall, 1987; Lawrence & Lorsch, 1967; Miles & Snow, 1978). These general organizational goals subsume the more specific "conflict causes" described in the conflict literature. In doing so, general organizational goals provide a

more appropriate level for a general model and also make clearer the connection between goal incompatibility and goals. This distinction maintains an important consistency with this study's definition of conflict.

## Goal Incompatibility,Blocking, and Conflict

Goal incompatibility forms the second step in the general conflict model. Goal incompatibility occurs when one party or group cannot reach its goal if another party or group does. This can arise from goal differences and/or the goal achievement being mutually exclusive. For example, one party might wish to set a 3% growth goal for their business division, while another member of the business division might wish to set a 5% growth goal. If the first party achieves the right to set an exact goal of 3% growth, then the specific goal of the second party cannot be met. In this instance, the goals differ and the achievement of one precludes the exact achievement of the other. In a competition circumstance, such as a race, both parties wish to win. They hold the same goal, but when the first contestant crosses the finish line, the goal of winning has been taken away from all other contestants. These examples describe the win-lose nature of goal incompatibility.

Blocking behavior represents the last factor necessary in the conflict process for conflict to arise. Schmidt and Kochan (1972) suggest that there are three ways in which blocking of another's goal achievement can take place: 1) blocking resource attainment; 2) blocking interdependent activities; or 3) blocking both. The actual blocking may be either intentional or unintentional, or active or passive in nature (Gray & Starke, 1988). In whatever manner blocking behavior ultimately takes place, interference with the goal desires of others provides the catalyst generating conflict.

## Conflict Behavior Styles

Once goals, goal incompatibilities and blocking behavior have led to conflict, organizations and their members must deal with the resultant conflict. Thus, the next step in the general conflict model is the actual conflict behavior, i.e., how organizations in fact handle their conflicts. Conflict behavior essentially falls into two basic forms, behavioral or structural (Rahim, 1977; Rahim & Bonoma, 1979). Structural methods of conflict behavior (or conflict management) make use of organizational design techniques such as formalization, hierarchical authority, and group homogeneity. Blake and Mouton (1964) introduced the first generally recognized classification of behavioral resolution management. Their classification rests on managerial styles arising from a trade-off of the concern for people and the concern for productivity (See Figure 8). This trade-off results in five styles of conflict behavior or management, with each style a distinctly different amalgam resulting from an interaction of the two underlying dimensions.

Some confusion exists in the literature on the names to assign to the different conflict behavior styles. This confusion arises from researchers using the Blake and Mouton (1964) classification and, for various reasons, renaming the styles (See Table 4). Thomas (1976) renamed the axes used by Blake and Mouton, describing the trade-off as one between concern for self versus concern for others. Both Thomas and Kilmann (1974) and Rahim (1983) have published questionnaires based on the work of Blake and Mouton. Both questionnaires have been widely used in conflict research on conflict management/conflict handling styles. This study will use the labels assigned to the five conflict handling styles by Rahim (1983) and also will use an adaptation of his instrument. The study will also use Ruble and Thomas's (1976) cooperativeness versus assertiveness description of the conflict behavior trade-off.

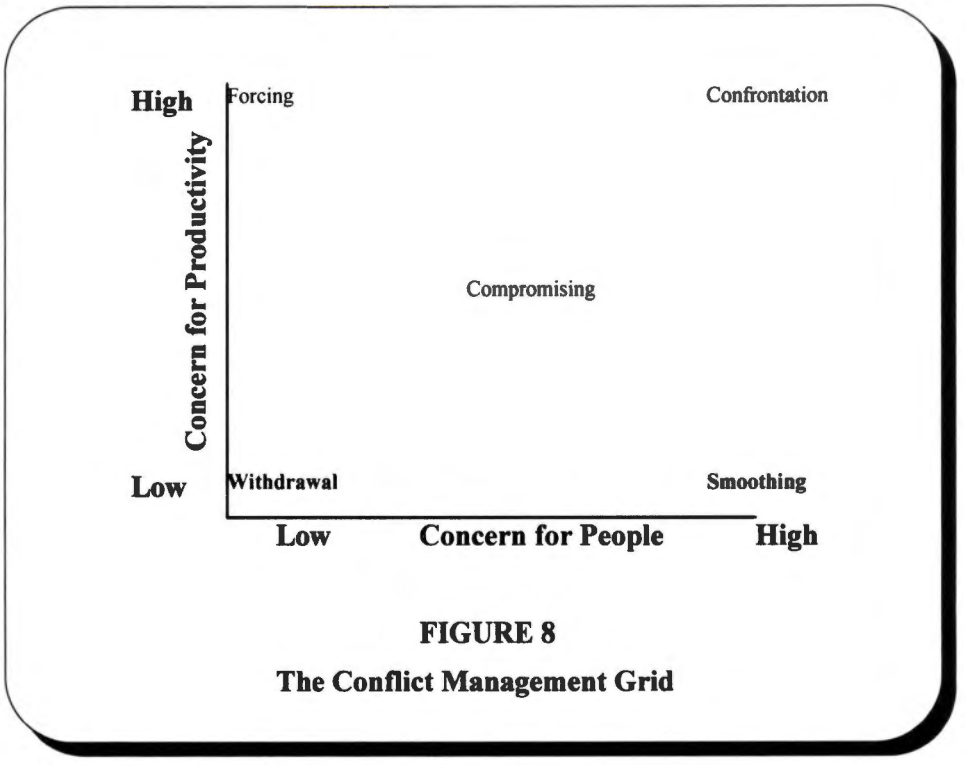



**FIGURE 8**
**The Conflict Management Grid**

**TABLE 4**
**Conflict Management Style Labels**

| BLAKE & MOUTON (1964) | | THOMAS (1976) | | RAHIM (1983) |
|---|---|---|---|---|
| Forcing | = | Competition | = | Forcing |
| Smoothing | = | Accommodation | = | Accommodating |
| Compromise | = | Sharing | = | Compromising |
| Problem-solving | = | Collaboration | = | Integrating |
| Withdrawal | = | Avoidance | = | Avoiding |

The conflict management styles of forcing, accommodating, compromising, integrating and avoiding will be defined as follows:

1. Forcing. This conflict handling style reflects low cooperativeness and high assertiveness. Thus, one party maximizes his own concern at the expense of the other party.

2. Accommodating. This conflict handling style reflects high cooperativeness and low assertiveness. Thus, one party acquiesces to the wishes of the other party.

3. Compromising. This conflict handling style reflects moderate cooperativeness and moderate assertiveness. Thus, both parties give and take, gaining partial fulfillment of both concerns.

4. Integrating. This conflict handling style reflects high cooperativeness and high assertiveness. Thus, both parties maximize both of their concerns through high cooperation.

5. Avoiding. This conflict handling style reflects low cooperativeness and low assertiveness. Thus, both parties involved in the conflict avoid or ignore all concerns.

## Outcomes of Conflict

The final major steps in the general conflict model are functional and dysfunctional outcomes. In other words, conflict outcomes encompass both positive and negative results (Pondy, 1967; Thomas, 1976; Tjosvold, 1989). The movement away from exclusively negative conflict outcomes has changed the face of the conflict research area. Essentially, the movement changes the mandate. The existence of multiple outcomes of conflict mandates the need for *management* of the conflict process. This approach replaces the previous mandate to reduce or eliminate conflict. To present an overview of the general outcomes of conflict, a comparison of the propositions of Coser (1956) (based on the work of the German sociologist Simmel) with conflict outcomes as identified by Gray and Starke (1988) (an organizational behavior approach) is made (See Tables 5 and 6).

**TABLE 5**
**Research Propositions on Conflict**
**(Coser, 1956)**

1. Conflict establishes the identity and boundaries of groups and once established also reaffirms the identity and boundaries.
2. Conflict preserves the group by allowing individual members to express their feelings while remaining within the group.
3. Conflict may be realistic, a means toward a specific result, or it may be nonrealistic, an end in and of itself.
4. Feelings of hostility arise from an inherent impulse of hostility and this interacts with the object of the hostility. Conflict is not just psychic; psychic may reinforce conflict directed toward a specific result.
5. Sociation is a mixture of positive and negative feelings.
6. The intensity of conflict is positively correlated to the closeness of the relationship.
7. Conflict helps remove dissociating elements in a relationship and move toward unity.
8. Hostile feelings existing in a relationship are more likely to be expressed if those involved feel confident of the relationship's stability.
9. Conflict with outside groups increases the unity of the ingroup.
10. Groups engaged in ongoing struggle with outgroups will tend to be intolerant of departures from group unity.
11. Struggling groups may seek out "enemies" in order to help maintain group cohesion.
12. The intensity of group conflict will be greater over objectified issues, than over immediately personal ones.
13. Conflict establishes a relationship between antagonists which will be institutionalized with regulations and norms.
14. A unified antagonist will prefer a unified opponent.
15. Conflict avoids disequilibrium by changing the basis for power relations.
16. Conflict makes strange bedfellows.

## TABLE 6
## Outcomes of Conflict: A Comparison

| Conflict Outcome | Gray & Starke (1988) | Coser (1956) |
|---|---|---|
| Positive | Conflict increases the energy level of groups or individuals. | Proposition 12: The intensity of group conflict will be greater over objectified issues, than over immediately personal ones.<br>Proposition 6: The intensity of conflict is positively correlated to the closeness of the relationship |
| Positive | Conflict increases group cohesion. | Proposition 2: Conflict preserves the group by allowing individual members to express their feelings while remaining within the group.<br>Proposition 7: Conflict helps remove dissociating elements in a relationship and move toward unity. |
| Positive | Conflict makes known problems, mobilizes information, clarifies objectives, and protects values. | Proposition 1: Conflict establishes the identity and boundaries of groups and once established also reaffirms the identity and boundaries. |
| Positive | Conflict aids adaptation. | Proposition 15: Conflict avoids disequilibrium by changing the basis for power relations. |
| Negative | Conflict results in a decline in communications. | Proposition 8: Hostile feelings existing in a relationship are more likely to be expressed if those involved feel confident of the relationship's stability. |
| Negative | Conflict leads to hostility and aggression. | Proposition 4: Feelings of hostility arise from an inherent impulse of hostility and this interacts with the object of hostility. Conflict is not just psychic; psychic may reinforce conflict directed toward a specific result.<br>Proposition 11: Struggling groups may proactively seek out "enemies" in order to help maintain group cohesion. |
| Negative | Conflict produces overconformity to group demands. | Proposition 10: Groups engaged in ongoing struggle with outgroups will tend to be intolerant of departures from group unity. |

## Assumptions of the General Conflict Model

In order to understand a research paradigm, one must understand the basic principles that are voiced, as well as the underlying assumptions that are frequently unvoiced. A number of critical unspoken assumptions affect research on conflict (See Table 7). These assumptions arise from a variety of common sense experiences within organizations and also from the views of early researchers who pioneered conflict studies and models. These biases have directed the topics and domains upon which it has been acceptable to do conflict research. As such, the assumptions underlying conflict research command our attention and understanding.

## Summary

Great thinkers in multiple societies have long recognized conflict as one of our formative social processes, affecting all social institutions. Today the modern corporation ranks as the dominant social institution in the lives of people in industrialized countries. This means that people carry out much of their social conflict within the corporation. In fact, managers indicate that they spend as much as a quarter of their time handling conflict (Rahim, 1986).

In response to the impact of conflict on organizations, researchers have established an extensive literature. This literature has crossed the bounds of psychology, sociology, economy, labor relations and international negotiation. Organizational research has drawn on all of these areas to generate both descriptive and normative models of conflict to explain the conflict process. Of these models, Pondy's (1967) episodic process model has dominated the field. Other researchers have complemented his work with conflict behavior, stage, structural, managerial response, and negotiated expectation approaches.

This chapter has presented a process model, as an explanatory frame for conflict, that represents a modification of a general model of conflict taken from the organizational behavior

## TABLE 7
## Assumptions of the Conflict Paradigm

| Assumption | Comments |
|---|---|
| Various kinds of goal incompatibility drive conflict. | Early research in conflict focused on the causes of conflict. Springing from organizational experience, this assumption has garnered extensive support with little empirical testing (Deutsch, 1980; Fink, 1968; Hall, 1983; Miles, 1980; Pondy, 1967; Walton & Dutton, 1969). |
| Conflict follows a recognizable course. | Stage models and cycle models reinforce this common sense assumption (Filley, 1975; Pondy, 1967; Thibaut & Walker, 1975; Sheppard, 1984). |
| Conflict produces positive and negative consequences. | Early research on conflict focused on negative outcomes. Recent research recognizes multiple outcomes ( Coser, 1956; Lewicki, Weiss & Lewin, 1992; Thomas, 1976; Tjosvold, 1989). |
| Conflicts and conflict handling behaviors change and adapt. | The entire research area of conflict within organizational behavior turns on the assumption that conflict handling behavior changes with circumstance and responds to training. Coser (1956) implies this in Proposition 13. |
| Conflict is managed in response to its conseqences rather than its causes. | Organizational behavior research has driven the conflict "management" side of conflict research, concentrating on resolution in response to consequences. Researchers in general have failed to connect causes to conflict management (Lewicki, Weiss & Lewin, 1992). |
| Collaborative behavior represents the best way to manage conflict. | The research of Blake & Mouton set the tone for this assumption. This has been reinforced by Thomas & Kilmann (1976) and Rahim (1983). |
| Models of conflict dynamics and resolution generalize across people, issues and settings. | Early efforts to develop general theories of conflict set the tone for this assumption. Bonoma (1984) refuted this assumption, calling for context sensitive studies in conflict and cooperation. |
| Organizations desire and need resolution of conflict. | Organizational behavior research does not consider the possibility of allowing conflict to run its course. Normative resolution techniques dominate (Blake & Mouton, 1964, 1978; Likert & Likert, 1976; Walton, 1969). |

literature (Gray & Starke, 1988). It gives a process view of the conflict concept, tying the causes of conflict to conflict resolution and to the nature of conflict outcomes. Finally, the chapter concludes with a review of the assumptions which generally underly today's conflict research.

Chapter Three presents a very specific area of conflict research. It explores the empirical research on conflict issues carried out in the R&D/marketing interface. Chapter Three concludes with a summary of key findings in conflict research in that area.

# CHAPTER 3

## Conflict Research in the R&D/Marketing Interface

*Although there has been significant progress in the study of conflict, the progress does not yet begin to match the social need for understanding conflict.*

*Morton Deutsch*
*"Fifty Years of Conflict"*
*Retrospectives on Social Psychology*

### Conflict and Innovation

A special relationship exists between conflict and innovation conceptually. Dewey sums it up very well and very succinctly:

> *Conflict is the gadfly of thought. It stirs us to observation and memory. It instigates to invention. It shocks us out of sheep-like passivity, and sets us at noting and contriving. Not that it always effects this result, but that conflict is a sine qua non of reflection and ingenuity. When this possibility of making use of conflict has once been noted, it is possible to utilize it systematically to substitute the arbitration of mind for that of brutal attack and brute collapse.*
>
> *(Dewey, 1950, p. 300)*

Dewey's words pointedly capture the catalytic nature of conflict within society and, thus, within the social system of the organization. It "instigates to invention." Conflict may be viewed as at least one of the *social engines* of innovation.

### Conflict in the R&D/Marketing Interface

The R&D and marketing interface presents one instance of the classic problem plaguing all firms--how to balance the benefits of separation (differentiation) with the concomitant need for unification (integration) (Lawrence & Lorsch, 1967). In particular, maximizing skills and

achieving effective joint efforts between R&D and marketing heavily impacts on the new product development process (Gupta, Raj & Wilemon, 1986). Although many studies in marketing, general management and economics cite successful integration of the two functional areas as key to successful innovation (Cooper, 1986; Gerstenfeld & Sumiyoshi, 1980; Mansfield, 1981; Souder, 1987; Wind, 1981), the process of mixing two polar processes and two polar groups inevitably leads to substantial friction. Thus, the R&D and marketing interface has garnered a considerable reputation over time for conflictful behaviors. As Ruekert and Walker (1987, p. 233) state:

> *Unfortunately, in many companies relations between these two departments are more often characterized by conflict than by creative cooperation.*

The integration of R&D and marketing in the process of developing new products, has become an accepted and important goal (Bonnet, 1986; Gupta, Raj & Wilemon, 1986; Wind, 1981). In fact, researchers consider the interface between R&D and marketing the most essential interface in the new product development process (Lucas & Bush, 1988). In the lexicon of obstacles to integration success, however, conflict stands as one of the major barriers to effective integration of the functional areas and, thus, to successful new product development and innovation (Souder, 1977).

Two points best sum up the importance of conflict to the R&D/marketing interface and to new product success. The first point is the prevalence of conflict, as stated previously. It is generally accepted that the R&D/marketing interface is too conflictful (Ruekert & Walker, 1987). Over 50 percent of new product development projects experience significant amounts of conflict (Souder, 1981). Thus, conflict is not a sometimes problem, but rather a persistent problem for interface effectiveness, impacting often on success.

The second point capturing the effect of conflict in the R&D/marketing interface is the commercial success of new products. As a baseline for comparison, new product projects which suffer no significant conflict problems enjoy complete commercial success in 66.7 percent of their efforts--with partial success in 19.4 percent of the projects and 13.8 percent failure in the rest (Souder, 1980). By contrast, new product projects experiencing severe conflict problems experience a 63.8 percent failure rate--with 21.3 percent partial success and only a 14.8 percent success rate (Souder, 1980). The impact is clear and significant.

## The Seminal Souder Research

Most research areas have their champions. In the R&D/marketing interface the champion of conflict research is William Souder (See Table 8). Souder began exploring the R&D/marketing interface in the 1970s. His early studies concluded that the failure to integrate the two functional areas raised a substantial barrier to the effective development of new products and innovations (Lawrence & Lorsch, 1967; Souder, 1977; Walton & Dutton, 1969). Previous literature focused on hierarchies and liaisons to integrate R&D and marketing. Souder chose instead to study intergroup conflict management processes within the firm, stating that of all the integration mechanisms available to the manager "conflict management may be the most likely to result in internalized changes that lead to lasting collaborative behaviors" (Souder, 1977, p. 603). In essence, he found that conflict management processes serve to achieve consensus and organizational integration, overcoming dissonant beliefs, different interests and a lack of appreciation. They achieve this through decision making and value exchange.

In a major, exploratory study for the National Science Foundation, Souder, Chakrabarti and Bonoma (1977) looked at the states of integration between R&D and marketing over the development and completion of 116 innovation projects carried out by 18 firms. The central

## TABLE 8
## Major Souder Studies Exploring Conflict in the R&D/Marketing Interface

| AUTHOR(S) | FRAMEWORK | STUDY DESCRIPTION | FINDINGS |
|---|---|---|---|
| Souder, Chakrabarti & Bonoma, 1977 | New product development. Integration emphasis. | Looks at coordinating mechanisms between R&D and Marketing. Exploratory. National Science Foundation study of 116 innovation projects within 18 firms. 258 in-depth interviews were conducted. The interview protocols were content analyzed. Coded data were analyzed using Kendall's Tau and chi-square. | The degree of R&D/Marketing integration is related to the project outcome. Effectiveness of information transfer and clarity of understanding the problem and the user's needs relate to project outcomes. Effectiveness of integration is related to the degree of legitimization of the integrator and the presence of a joint reward system. The degree of conflict relates to the presence of technical and marketing uncertainty. The degree of integration required is related to the degree of uncertainty present. |
| Souder, 1977 | New product development. Settings and leadership style focus. | Looks at nominal, interacting settings, and leadership styles. Experimental design, using participants in a management training program representing a small number of companies. | Interpersonal-intragroup conflicts cannot be resolved by avoidance. Nominal and interacting settings need to be combined and cycled for best results. In combined nominal-interacting groups the leader needs to be an "effective integrator." |
| Souder, 1980 | New product development. Key interface problem focus. | Explores key problems affecting the R&D/Marketing interface and their managerial implications. In-depth cascading interviews of 312 R&D and Marketing personnel at 38 Industrial Research Institute member firms. | Identified lack of communications, lack of appreciation, distrust, and too-good friends as the key problems affecting the interface. Suggests ten guidelines for managerial use to overcome the interface problems identified. |
| Souder, 1981 | New product development. Relationship between project states and success rates emphasis. | Relates project states (harmony, mild disharmony and severe harmony) with commercial success in product development. Cascading interviews with protocols content analyzed. Twenty randomly selected U.S. corporations,$7 B to $100 M in annual sales. | Of 116 projects, 45.7% were harmonious, 21.5% were mildly disharmonious and 32.8% were severely disharmonious. Of the harmonious projects, 53% produced complete commercial successes. Of the severely disharmonious, 68% failed commercially. |

## TABLE 8 (Continued)
## Major Souder Studies Exploring Conflict in the R&D/Marketing Interface

| AUTHOR(S) | FRAMEWORK | STUDY DESCRIPTION | FINDINGS |
|---|---|---|---|
| Souder, 1987 | New product development. Broad view of new product project management. | Looks at how to manage new product projects more effectively. 10 year field study. Includes 289 product development innovation projects at 53 companies. Personal and telephone interviews, in-depth interviews and 27 instruments. | No one best way to manage innovation projects. Ten project methods are presented. The Committee Project Manager method is found to have the highest (73%) rate of project success. Second is the New Product Committee with a success rate of 72%. Ten management principles are presented. One of them is to eliminate disharmony between R&D/Marketing. |
| Souder, 1988 | New product development. Model for guideline application focus. | Develops better understanding of processes taking place in new product innovation. Same ex post exploratory field study data base used for the 1987 book. Cluster analysis used to identify interface states. | Eight guidelines for overcoming existing disharmony: break large projects into smaller ones; be proactive toward interface problems; eliminate mild problems before they escalate; involve R&D/Marketing early; promote dyadic relations; insist on open communications; use interlocking task forces, clarify decision authorities. |
| Moenaert & Souder, 1990 | New product development. Communication issues emphasis. | Asks what are the determinants of the perceived utility of extrafunctional information. Seventeen interviews were conducted in three Belgian companies_one service firm, five manufacturers. Two product consumer goods and three product industrial products. Thematic content analysis was performed. | Technologists and marketers agree on the importance of interpersonal communication. Face-to-face communications are fast, motivating, allow feedback, and allow continuous checking. The negatives include lack of structure, fragmented content, a transient character, absence of hard copy and functional language differences. Appropriate communication styles differ in the planning and development stages. Seven propositions on the perceived utility of information received by R&D and Marketing are developed for future research efforts. |

purpose of the study was identification of effective integration methods between R&D and marketing. The authors proposed five relationships based on previous interface research and tested them. The first proposition established empirical support that high degrees of interaction and integration between R&D and marketing are related to both commercial and technical success rates for innovations. The greater the interaction and integration the higher the success rates. The second proposed relationship, also supported by the data, indicated that the clearer and more effective the information transfer in the interface the more successful the project outcome. The study data strongly supported the third proposition, which posed that highly legitimized integrators and joint reward systems lead to more effective integration. The fourth proposition, also supported by the data, found that the greater the technical and marketing uncertainty the greater the degree of conflict between R&D and marketing. Finally, the fifth proposition, by virtue of data support, established that the greater the degree of uncertainty, the greater the need for integration in the interface (confirming Lawrence & Lorsch, 1967). The study also looked in general at organizations' chosen management methods, introducing ten different management approaches.

In 1977 Souder, using an experimental design, conceptualized that conflict management takes place in more than one organizational setting. Though he posed that conflict management processes bring conflicting parties together for decision making and the exchange of values, this could be enacted in either "nominal" or "interacting" settings. He defined "nominal" settings as exchanges in which there are no confrontations, challenges or emotional outbursts, but rather a purely task-oriented process. A Delphi exercise provided the example. "Interactive" settings, on the other hand, involved open, face-to-face confrontations among organizational members. The study data supported the existence of the "nominal" and "interacting" settings.

Results indicated that "nominal" settings culminate in a statistical level of consensus, but do not allow personal exchanges which encourage value modification and build cooperative behaviors. Also, the results indicated that "interactive" settings, although they lead to value search and cooperative behavior search, do not provide mechanisms for conflict handling. Therefore, Souder recommended combining and cycling both settings in the conflict management process in order to produce the most effective conflict management. Souder (1977) also showed that outstanding leadership could not "make up for" the absence of one of the settings. He found additionally that avoiding the conflict situation did not help to resolve the conflict. Success, then, in conflict management demands inner action, interaction, openness, trust and leader sensitivity.

In 1980 Souder conducted a study of 38 Industrial Research Institute member firms, carrying out 312 in-depth interviews with personnel from 150 randomly selected R&D projects. Four problems with the interface recurred: 1) the lack of communications, 2) the lack of appreciation, 3) distrust and 4) too-good friends. Lack of communications and too-good friends created mild problems with the interface and resulted in a 32.2 percent project rate of complete commercial success. Lack of appreciation and distrust created severe problems with the interface and resulted in a 14.8 percent rate of complete commercial success for projects. Or, to put it the other way round, projects with no significant problems with the interface enjoyed a 66.7 percent success rate, while projects with severe problems saw 63.8 percent of their efforts fail.

Souder (1980) found that respondents blamed leadership from top management for the "lack of appreciation" problem because "we don't see any signals from top management that collaboration gets you anything" and "we get more brownie points on our own than by sharing" (p. 11). Also, the respondents, representing top-level, middle-level and project-level employees,

indicated that leadership contributed heavily to the "distrust" problem when top management allowed personality conflicts to remain unresolved or when they allowed power/prestige imbalances to occur between R&D and marketing. The study concluded that lack of appreciation was the most common single obstacle to the successful integration of the two departments.

To deal with the problems identified, Souder recommended ten guidelines: 1) break large projects into small (larger groups had more conflictful relations); 2) take a pro-active approach toward interface problems; 3) get rid of mild problems before they become severe; 4) make everyone responsible for open communications; 5) encourage dyadic relations between the two areas; 6) set up a New Product Committee; 7) be sure project managers are highly qualified; 8) involve both functional areas early in the product innovation process; 9) get agreement on decision authority; and 10) fit the structure of your new product development process to your technology and the market you are entering (Souder, 1980).

In 1981 Souder further refined his 1980 study and developed a typology of conflict levels within the firm: "harmony," "mild disharmony," and "severe disharmony." "Mild disharmony" includes "lack of communications" and "lack of interaction." "Severe disharmony" includes "lack of appreciation" and "distrust." "Mild disharmony" results from neglect of the interface and leads to decreased organizational effectiveness. "Severe harmony," on the other hand, can be debilitating for the organization. Managerial recommendations suggest specific organizational actions for nurturing harmony and also for correcting existing disharmony.

Time becomes an issue in this study. Souder discusses the valuable hours of organization time eaten up in disharmony situations by dispute-settling processes. This results in activities and decisions crucial to new product development being delayed (Souder, 1981). The study concluded that the failure rates of new products were higher in projects suffering from

severe disharmony (with failure defined as "meeting few or none of the commercial targets and expectations that were originally set for the product") (Souder, 1981, p.71). Also Souder found that disharmony becomes institutionalized within organizations, confirming Simmel's tenets on social conflict. This presents another time cost, for once disharmony is established it continues to slow the product innovation process for protracted times. Souder (1981) states that the cost of proactive conflict management, which is time-consuming, is "minuscule" compared to the product failures, time loss and disruptions associated with disharmony between R&D and marketing.

Souder summarizes his research of the 1970s and 1980s in *Managing New Product Innovations* (1987) through a broad discussion of new product management within the firm. From ten years of R&D and marketing interface research, he offers ten methods of new product project management observed in industry. The book evaluates each method for its success rate, i.e., meeting or exceeding commercial expectations, stating that there is no one "right" method. The commercial project manager technique averaged the highest success rate at 73 percent. This method used independent budgeting, a leader chosen for expertise, top management support without interference, technical know-how and participatory management. Interestingly, this method was also associated with frequent outbursts of conflict. These outbursts were openly discussed and resolved, however.

Souder (1988) also has presented a framework for applying many of the managerial behaviors identified in over a decade of R&D/marketing interface research, the Customer-Developer-Conditions Model. The model is a matrix with R&D's level of sophistication on the vertical axis and the customer's level of sophistication on the horizontal axis. The resulting cells are lettered and tied to eight guidelines designed to improve relations

between the two functional areas. The guidelines define the roles which R&D and marketing must play in order to bring the knowledge and capabilities of R&D into line with the wants and needs of the customer.

Moenaert and Souder (1990) investigated the importance of interpersonal communication in the interface. The study found that extrafunctional information is welcome during the planning stage of innovation, but is more critically reviewed later during the development stage. The study proposes that face-to-face communication offers the best medium for controlling differences in functional languages since it is quick, motivating, allows feedback and continuous checking by the source and receiver.

## Other Studies of R&D/Marketing Conflict

Gupta, Raj and Wilemon's research has been primarily in the area of general integration issues. Their studies have led, however, to some interesting contributions in the area of conflict. In their 1985 study of 167 small and medium-sized research-oriented firms, 109 marketing managers and 107 R&D managers indicated that one of the top barriers to integration was communications, i.e., not being able to agree on important issues. The frustration and dissatisfaction felt over this conflict appears to be higher among marketing managers than R&D managers.

Gupta, Raj and Wilemon (1986) developed a model for the general study of the R&D/marketing interface. They present fourteen propositions. Proposition 9 encompasses conflict's impact on integration of the two functional areas. It states (p. 12): "The more harmonious R&D/marketing operating characteristics, the greater the degree of integration that will be achieved." To paraphrase, the better managed the conflict between R&D/marketing operating, the greater the degree of integration achieved. Managing conflict better includes

involving both areas early in the new product development process, listening to each other's points of view, discussing issues openly, and resolving conflicts at the lowest point in the organization that is possible.

Gupta and Wilemon (1988) in a study of credibility of marketing information and marketing managers state that "organizational practices help create and shape an organization's climate" (p. 26). Six dimensions then define and measure the organizational practices. The first of these is R&D/marketing operation characteristics, among which are the level of conflict resolution and the manner in which resolution takes place. Based on a sample of R&D managers from 80 high-technology firms, the results indicate that operating characteristics impact R&D/marketing cooperation more significantly than any other dimension. Also the study indicates that conflicts within the firm should be dealt with as soon as possible and at the lowest possible level of the organization.

Ruekert and Walker (1987) explored integration issues in a study using three divisions of a Fortune 500 industrial manufacturer. Looking at integration issues between marketing and other functional areas of the firm, the study generated fourteen research hypotheses, four of which center around conflict issues in interfunctional processes. The hypotheses suggest that: 1) the level of conflict between marketing and other functional areas should rise as the level of resource and work flows also rise; 2) perceived effectiveness of the interface should be negatively correlated with the amount of conflict; 3) perceived effectiveness of the interface should rise as conflicting personnel work out their differences among themselves; and 4) conflict levels should rise as communication difficulty rises. Of these hypotheses, the data clearly supported only number 4--communication difficulty is positively related to conflicts. Strong positive correlations between conflict resolution mechanisms and effectiveness suggest,

however, that when conflicts are worked out by those involved in the dispute effectiveness of the interface is promoted.

Ruekert and Walker (1987) further explored conflict issues using the same three divisions of a Fortune 500 industrial manufacturer. This study focused on the amount of conflict between R&D and marketing, the structural mechanisms used for conflict reduction and resolution, and the impact of conflict on the effectiveness of the interface. As value-added, the authors related conflict issues to the strategic position of the firm, using Miles and Snow's typology. The researchers generated five hypotheses: 1) conflict levels should be higher in Prospector firms than in Defender firms (supported); 2) formalization should be higher in Defender firms than Prospector firms (not supported); 3) Defenders should rely more on hierarchical modes of conflict resolution than Prospectors (not supported); 4) Prospectors should use avoidance, conciliatory and participative resolution mechanisms more than Defenders (partially supported); 5) Prospector personnel should have less positive attitudes toward conflict resolution than Defenders (supported); and 6) Prospectors' perceived effectiveness of interaction should be lower than Defenders (not supported).

In addition to the questionnaire items analyzed, Ruekert and Walker (1987) discussed open-ended questions about the kinds of conflict in the interface. Several interesting points were made. First, both marketing and R&D agreed that conflict tends to flare up over relatively few issues. Interestingly, the two groups found the issues to be very much the same ones: 1) a difference in the value placed on customer orientation (marketing highly valuing customer orientation, R&D not); 2) a lack of support for each other's needs; and 3) unclear new product development goals, objectives and departmental responsibilities. The Ruekert and Walker (1987) study represents an important step in the conflict literature by seeking to understand the

relationship between conflict resolution and strategy. Like all studies it suffers from limitations, in this case using only three SBUs within a single corporation and responses from only the marketing side of the interfunctional dyad. Responses were solicited from both areas, but low response numbers from the R&D personnel in Prospector units prohibited analysis.

Dyer and Song (1995) extend the work of Ruekert and Walker and others by investigating conflict issues outside the American culture and by surveying both marketing and R&D managers for their responses. The study, like the Ruekert and Walker (1987) study, looks at the relationship between business strategy and conflict issues. The authors hypothesize that in Japanese high-technology firms: 1) the perceived level of conflict between R&D and marketing will be greater in Prospector firms than in Defender firms (supported); 2) integrative conflict resolution modes will be used more by Prospectors than by Defenders (supported); 3) Defenders will rely more on formalization between R&D and marketing than will Prospectors (not supported); and 4) Defenders will rely more on hierarchical modes than will Prospectors (not supported).

The two unsupported hypotheses prove to be very interesting. The results are significant, but reversed. It appears that formalization and hierarchy are probably more often used by Prospectors than Defenders for conflict handling in Japanese firms. It also appears that this is true in American firms, as Ruekert and Walker (1987) found the same relationship in their American sample. The original logic for the hypotheses stems from the description of the "Administrative Problem" identified by Miles and Snow (1978). Yet, it appears that the response of Prospectors to higher levels of conflict may be the use of a range of management methods, including formalization and hierarchy.

The results of the other two hypotheses support conflict findings in other studies. This is

of interest in that such support and the similarity of results on hypotheses three and four mirror conflict research in the United States. Nothing in this study suggests major differences between Japanese and American interface conflict problems.

**Summary**

Chapter Three has given an overview of the research done on conflict issues in the R&D/marketing interface. William Souder has contributed greatly to the investigation of conflict issues in the R&D/marketing interface and to the development of recommendations to managers. Because of Souder's extensive work on interface issues we know some details of appropriate conflict management prescriptions for the two functional areas (See Table 9). These prescriptions include establishing trust, sensitivity in leadership, open communications, clear decision making authority and independent budgeting for projects.

Also, Ruekert and Walker, Gupta, Raj and Wilemon and others have provided additional empirically established guidelines for conflict management in the interface (See Table 10). These guidelines include quick conflict resolution, settling conflict where it occurs, allowing those involved to settle conflicts, formalization, and multiple resolution techniques. All of these contributions have moved us closer to understanding interface conflict and being able to assist business managers. Chapter Four will present: 1) a discussion of research needs in conflict and the R&D/marketing interface; 2) a perceptual context model of organizational conflict; and 3) hypotheses drawn from the literature.

**TABLE 9**
**Conflict Management Prescriptions (Researched by Souder)**

| CONFLICT MANAGEMENT STRATEGY | EMPIRICAL SOURCE |
|---|---|
| Combine Nominal and Interactive Settings | Souder, 1977 |
| Establish Trust | Souder, 1977 |
| Select Leaders with Sensitivity | Souder, 1977 |
| Make Open Communications Everyone's Responsibility | Souder, 1977 |
| Engender Appreciation of Others | Souder, 1980 |
| Limit Interacting Groups to Less Than Seven Members | Souder, 1980 |
| Involve R&D and Marketing Early in Process | Souder, 1980 |
| Choose Highly Qualified Project Leaders | Souder, 1980 |
| Clearly Specify Decision Making Authority | Souder, 1981 |
| Independently Budget Innovation Projects | Souder, 1987 |
| Use Face-to-Face Communications | Moenaert & Souder, 1990 |

**TABLE 10**
**Conflict Management Prescriptions (Researchers Besides Souder)**

| CONFLICT MANAGEMENT STRATEGY | EMPIRICAL SOURCE |
|---|---|
| Resolve Conflicts Quickly | Gupta, Raj & Wilemon, 1988 |
| Settle Conflicts as Low in the Organizational Hierarchy as Possible | Gupta, Raj & Wilemon, 1986 |
| Listen to What the Other Functional Area Has to Say | Gupta, Raj & Wilemon, 1986 |
| Allow Those in Conflict to Settle the Problem Among Themselves | Ruekert & Walker, 1987 |
| Formalize Goals, Objectives and Work Responsibilities | Ruekert & Walker, 1987 |
| Instill a Customer Orientation in Both Areas | Ruekert & Walker, 1987 |
| Teach Areas to be Supportive | Ruekert & Walker, 1987 |
| Be Flexible; Explore Multiple Resolution Techniques | Dyer & Song, 1995 |

# CHAPTER 4

## Research Hypotheses

*True cooperation comes only after true conflict.*

*Harry Brittan*
*Saturn Corporation, 1993*

### Research Needs in Conflict

Every research area includes dimensions with strong positive results and those either not explored or less well explored. For example, Chapter Three reviewed the strong positive results in conflict research relative to the R&D/marketing area (See Tables 9 and 10, p. 53). Researchers who carry on the conflict research tradition, however, assume not only the shared responsibility to build on positive results but also to address those areas that have been relatively overlooked. Several salient concerns in the area of conflict research in general and the R&D/marketing interface in particular present themselves: 1) the modeling concern; 2) the empirical testing concern; 3) the normative/descriptive issue; 4) the context concern; 5) cooperative bias; and 6) the tools concern (Lewicki, Weiss & Lewin, 1992). These issues form paramount directives for future research.

***Models.*** As evidenced by the recent review article of Lewicki, Weiss and Lewin (1992), the conflict research area enjoys a plethora of models--44 major models of conflict, negotiation, and third party processes. In the conflict area alone, researchers have generated approximately a dozen major models (Blake & Mouton, 1964, 1978; Filley, 1975; Likert & Likert, 1976; Pondy, 1967; Pruitt & Rubin, 1986; Rapoport, 1960; Ruble & Thomas, 1976; Sheppard, 1984; Thibaut & Walker, 1975; Thomas, 1976; Walton, 1969). Thus, conflict research certainly does not need

another model. This research responds to this evaluation of past and current conflict research by building on a standard organizational behavior model with only minor modifications.

***Empirical testing.*** Where rigor in the conflict area has led to multiple conceptual models, rigor has not led to extensive empirical testing. For example, despite the dominance of Pondy's (1967) model, no empirical testing of it has taken place (Pondy, 1992). Conflict behavior styles, though originated by Blake and Mouton (1964) in a descriptive approach, form an important exception to this lack of empirical testing. These styles have withstood substantial empirical examination. Souder, too, has approached his exploratory work on conflict in the R&D/marketing interface from a strong empirical position. This study will strengthen the empirical side of conflict research by empirically studying the R&D/marketing interface using constructs from empirically strong conflict handling research.

***Normative/descriptive issue.*** Much of the research done in conflict has focused on a normative approach or a descriptive approach (as shown in Table 3 of Chapter Two). This focusing has resulted in a failure to maximize positive outcomes for both academics and business managers. One can speculate that there is something of this problem in the gap that exists between R&D/marketing research and the persistent problems found in the relationships of active R&D and marketing units. The model used in this study incorporates both a descriptive theoretical concept of the conflict process and a prescriptive concern for the practicalities of how organizational conflict behaviors feedback to and affect conflict.

***Context.*** Bonoma (1976) stated: "In their long history of service, the concepts of power, conflict, cooperation, and trust have generated much heat and even a little light in the social disciplines." Part of Bonoma's apparent frustration stems from a long term research impetus to develop context-free theories around the conflict constructs. He spoke out strongly against such

a practice, observing that even our basic definitions of the constructs of power, conflict and cooperation change with the context in which we view them. This study addresses the context concern from two different perspectives by looking at group differences in strategic approach and functional orientation.

***Cooperative bias.*** Several biases exist within the conflict research area. This paper has already presented the bias that has existed in past research (still does exist in organizations and the population at large) toward negative outcomes from conflict (See Chapters 1and 2). A bias toward cooperative approaches for effective conflict resolution also affects the research area. This bias began with the initial work of Blake and Mouton (1964). Their managerial grid prescribes specifically to practitioners that cooperative behaviors work best in resolving conflict. Those researchers following Blake and Mouton reinforced the perspective by adopting the grid wholesale or in a modified fashion (Pruitt & Rubin, 1986; Rahim & Bonoma, 1979; Ruble & Thomas, 1976). In point of fact, there is no empirical basis for claiming this. There is good logical reason to believe that cooperative behaviors work best in some circumstances and competitive ones work best in others. We will have to await empirical outcomes to have any assurance.

Social desirability compounds the issue. Thomas and Kilmann (1975) examined the social desirability of the five conflict handling styles and found that respondents ranked the styles from most desirable to least in this fashion: 1) integrating; 2) compromising; 3) accommodating; 4) forcing; and 5) avoiding. Social desirability comes into play in particular where an individual must assess his or her own conflict behavior. Human nature dictates that we all tend to believe we are in the right when we disagree. Also, there is reason to question whether individuals clearly see the immediate effect of what has become habitual. This study

of the cooperative bias issue by asking members of R&D and marketing to answer questions about the conflict handling behavior of others rather than themselves.

***Tools.*** A review of the conflict research in the R&D/marketing interface reveals substantial information that could be shared with practitioners. Yet, the transfer of information in such a way as to change conflict problems in the interface has not occurred. Souder has bemoaned the fact that the discipline is not diffusing the understanding and knowledge that we have gained to the practitioners who so sorely need it. After many years of interface research Souder (1988, p. 19) states:

> *Far too little is known about what constitutes real disharmony, the distinctions between professional disagreement and disharmony, how to alter the institutionalized roles between R&D and Marketing and how to implement new team approaches between R&D and Marketing personnel.*

This is of concern since conflict is so prevalent. For example, nearly two-thirds of the 289 projects (56 consumer/industrial product firms) in Souder's 1988 study experienced R&D/marketing disharmony.

Failure of companies to overcome the conflict problems between R&D and marketing stems from practitioners not having the "tools" they need to change their organizations. This lack of tools arises in large part from the normative/descriptive issue. Researchers, in not combining the two in their conceptualizations, have created a gap. While findings clearly indicate a laundry list of "what" practitioners need--e.g., trust, local control of conflict resolution, and multiple conflict resolution techniques--they are silent on "how" the organization might accomplish the laundry list. This study addresses the tools concern by researching the behaviors actually used in conflict, providing a step toward the "how" for practitioners.

## A Perceptual/Context Model of Conflict

Bonoma (1976) focused attention on context in conflict research by comparing conflict, cooperation, and trust. Under three different power systems the key dimensions of each of these constructs changed dramatically. Katz and Kahn (1978) posed that context factors outweighed individual pre-dispositions as predictors of conflict situations. The organizational behavior literature supports the idea that organizational context strongly influences conflict (Barclay, 1991). Morton Deutsch (1980) even reaches back to 1929 to point out that Maller's dissertation concluded that environmental factors mold conflict. Yet, conflict research has done little with these insights.

In 1976, Kenneth Thomas wrote the conflict management chapter for the classic *The Handbook of Industrial and Organizational Psychology*. Thomas's definition brought to conflict research a perspective underemphasized by the field--that of perception's role in the conflict process. The model presented here combines this emphasis on perception with the critical influence of context, addressing context via two avenues (See Figure 9). First, the study deals with a very specific structural environment--the R&D/marketing interface. Second, the study looks at strategic choice in new product development, using the Miles and Snow (1978) typology. This provides the opportunity to gain more insight into the nature of conflict and conflict behavior from one context to another.

## Research Questions

The current study builds on the previous research in the R&D/marketing interface by addressing three critical needs: 1) organizations' need to know something about actual conflict behaviors in the interface; 2) organizations' need to begin to think in terms of managing their

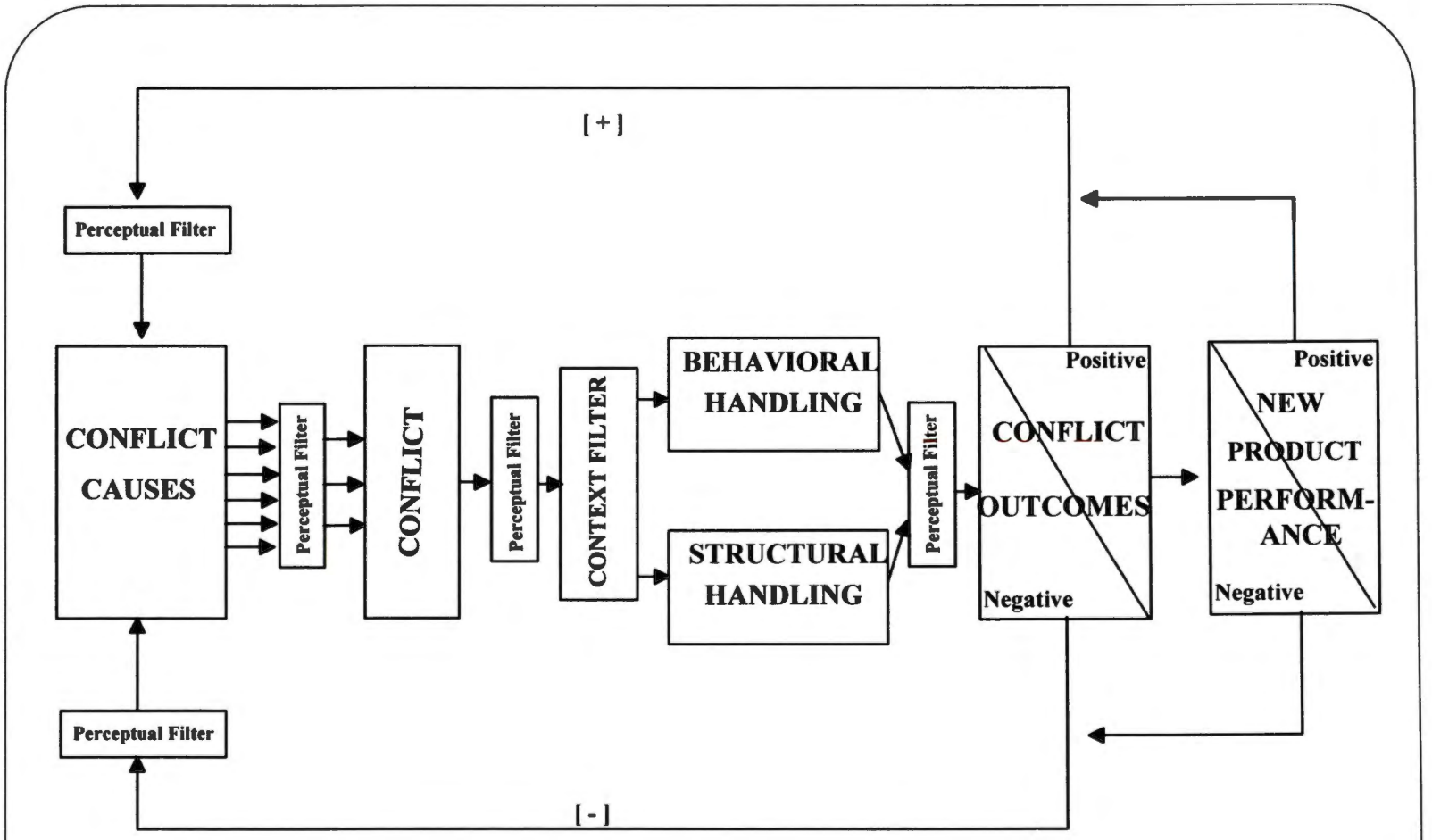



**FIGURE 9**

**A Perceptual Context Model of Conflict in the New Product Development Process**

conflict to engender constructive results; and 3) organizations' need to think in terms of whether conflict behaviors may differ appropriately from situation to situation.

Organizations need to know something about actual conflict behaviors in the *interface*. Conflict studies in the R&D/marketing interface have generally operated at a more global level in their conceptualizations. It is critical to recognize that conflict behaviors provide the mechanism for conflict and its management--but also become the building blocks of future conflict. As suggested by Simmel (1905), conflict behaviors become institutionalized, thereby contributing heavily to the positive or negative relationships between groups.

Organizations must begin to think in terms of managing conflict to engender constructive results. That is, managers need to know how to productively manage conflict. As pointed out in Chapter Two, the managers questioned by Thomas and Schmidt spent as much as a fourth of their time handling conflict (Rahim, 1986). Conflict management looms large for the organization. Also, from the point of view of the academic, if we desire to establish the veracity of the new conflict paradigm--that conflict can result in positive outcomes--then we must include this concept in our research questions. Tjosvold (1989) has promoted this idea strongly within the organizational behavior area. This practitioner-oriented approach shapes itself well to the "bottom-line" perspective of R&D and marketing.

Finally, organizations need to think in terms of how conflict behaviors may differ from situation to situation. For example, how might the same conflict behavior result in a positive outcome in one case and a negative one in another. Certainly, a wide range of situational differences exist within and between companies as they deal with conflict on a daily basis. The findings of Souder (1977) echo this need for considering carefully the settings in which conflict behaviors take place. He found that both "nominal" and "interacting" settings have their

strengths and weaknesses. Unfortunately, interfunctional conflict management research since the 1977 Souder study has generally looked at the conflict management process without considering setting, i.e., assuming all settings to be the same. Souder's early research, however, and that of Tjosvold (1991) present a solid foundation for pursuing the importance of organizational setting in conflict research.

A good beginning at gaining an understanding of situational differences would be an examination of firms pursuing different business strategies. One of the most researched typologies of business strategies is that of Miles and Snow (1978), identifying four strategic types--Prospectors, Analyzers, Defenders, and Reactors. This typology allows exploration of conflict behaviors in firms that proactively seek new markets and new products, as well as those focusing on a narrower range of markets, products and technology.

## Research Hypotheses

***Conflict and Strategy.*** Miles and Snow introduced a strategic typology in 1978 in which the strategies pursued by business firms are defined by three problems which organizations must solve as they adapt to their environments: 1) the Entrepreneurial Problem; 2) the Engineering Problem; and 3) the Administrative Problem. The Entrepreneurial Problem deals with defining the domain and product markets that a company will pursue. The Engineering Problem deals with the technology, both physical and human, for production and distribution that companies must manage. The Administrative Problem deals with the trade off that the company must make between future innovations and sorely needed stability of structure and process within the firm.

The acting out of these three processes results, according to Miles and Snow, in four strategic types, Prospectors, Analyzers, Defenders and Reactors. The typology describes Prospectors as those companies aggressively pursuing multiple product markets, i.e., exploring a

broad domain. It describes Defenders as those companies steadfastly pursuing a limited and stable number of products, i.e., exploring a narrow domain. The Analyzer, then, falls between the Prospector and Defender by choosing to pursue one stable domain and one changing domain, i.e., a broader market where that most benefits the firm and a narrow market where that most benefits the firm. Reactors, on the other hand, pursue no proactive strategy at all. Instead, they react to market changes at the last minute. In point of fact, Reactors form a group of companies that are actually a-strategic.

Miles and Snow's (1978) typology has been used in both management and marketing research studies to study strategic choice. The typology's particular applicability to conflict studies rests in the clear explication of conflict management provided for each of the strategic types. Miles and Snow (1978) define conflict behavior as part of the Administrative Problem that firms face. The Prospector, due to its decentralized nature, must make special efforts to deal with its complex subunit relationships. Miles and Snow suggest that simple mechanisms often do not work well enough to meet the Prospector's needs. Compared to the Defender, conflict in the Prospector tends to be "diffused and varied" (p. 64), because so many individuals and groups seek to generate ideas that disagreements often occur. Multiple domains also necessitate a more horizontal structure in Prospectors to cope with the inherent changes taking place--to provide the flexibility needed. This horizontal structure steps outside of normal hierarchical management and produces a more problem-oriented, cross-functional firm--one which must deal with very complex conflict situations.

Miles and Snow (1978) contend that conflict levels between subunits within a firm may be affected by the strategy which the business is pursuing. Ruekert and Walker (1987) confirm this conclusion, stating that the differences in conflict level arise due to different levels of

complexity faced by firms pursuing different strategies and due to the different organizational structures created in response to the strategic choice made by the firm. Because the Prospector aggressively seeks a broad and changing domain, a high level of uncertainty and complexity exist within the organization. The stable, narrow domain of the Defender leads to a low level of uncertainty and complexity.

Communication styles, however, may balance the effect of environmental uncertainty and complexity. Prospectors must communicate frequently on many routine, as well as non-routine interactions--and they must communicate laterally. This leads to a greater need for and understanding of other functional units. Defenders carry out their work sequentially and vertically, making interfunctional exchange less frequent and consequently with less concern for the other functional area in a given dyad. This leads to a disregard for interpersonal skills. Virtually all conflict researchers cite good communication skills among the most critical to managing conflict (Souder, 1988). Because the importance of good communication is so great in conflict situations, we expect that:

$H_1$: In conflict situations between R&D and marketing, Defenders will have a higher perceived level of conflict than Prospectors.

Based on the Miles and Snow (1978) description of the administrative task, several conjectures can be made about how conflict management styles might relate to strategic types. Five conflict behavior styles have been identified and commonly used in the literature on conflict: accommodating, compromising, integrating, avoiding, and forcing (Blake & Mouton, 1964; Rahim, 1983; Thomas & Kilmann, 1978) (See Chapter Two, pp. 31-33). Of the five conflict management styles, avoiding and forcing only involve input from one group, while the remaining three styles demand interaction of two groups, i.e., these styles translate into three levels of attempted cooperation and two of non-cooperation. The cooperative conflict behavior

styles maximize information exchange, suiting them to complex conflict behavior situations. Prospectors routinely must handle complex conflict behavior situations and have developed interfunctional communication skills. Therefore we hypothesize that:

$H_2$: In conflict situations between R&D and marketing, Prospectors will use accommodating, compromising, and integrating conflict behaviors more than Defenders.

An emphasis on hierarchical authority strongly influences the conflict processes of Defenders. Because subunit interdependencies are stable and repetitive for Defenders, simple structural forms of coordination suffice to handle conflict--for example, standardization, formalization and hierarchical authority. Simple, often sequential, subunit interdependence reduces communications between subunits and also reduces the need for nonroutine decision making. Thus, decision making is often non-participative and quick in order to promote efficiency. The conflict behavior styles that minimize information exchange and promote efficiency are the forcing and avoiding styles. Each eliminates a need for communication and joint process, thus reducing time and effort. Thus, we pose that:

$H_3$: In conflict situations between R&D and marketing, Defenders will use forcing and avoiding conflict behaviors more than Prospectors.

Organizational structure also plays a part in conflict behavior (Rahim, 1985; Rahim & Bonoma, 1979). The most commonly used structural component to manage conflict behaviors in organizations is formalization (McCann & Galbraith, 1981). Centralization, or the use of hierarchical structure in managing conflict behaviors, also plays a role in most organizations. Miles and Snow (1978, pp. 44) unequivocally state: 1) "Defenders develop a relatively high degree of formalization"; and 2) for the Defender "the solution to the administrative problem must provide management with the ability to control all organizational operations centrally." Likewise they indicate that Prospectors develop low structural formalization and develop de-centralized structures.

Based on the prescription provided by Miles and Snow (1978), Ruekert and Walker (1987b) and Dyer and Song (1995), predicted that structural conflict management factors such as formalization and use of hierarchy would be relied on more by Defenders than Prospectors. These researchers found, counter to expectations, that Prospectors relied more on formalization and hierarchy than did Defenders. This suggests that Prospectors, faced with complexity and more adept at communication skills, must use formalization to maintain some semblance of order. It also suggests that with multiple, complex interactions, Prospectors must use vertical as well as horizontal structure to handle conflict situations. Finally, it mirrors Miles and Snow's point that the complexity of the Prospector demands efforts beyond the norm to manage conflict behaviors. Therefore, given previous research findings and given the communication needs of Prospectors, this study proposes that:

$H_4$ In conflict situations between R&D and marketing, Prospectors will rely on formalization more than Defenders.

$H_5$: In conflict situations between R&D and marketing, Prospectors will rely on hierarchy more than Defenders.

The internal environment of all firms results in conflict behavior habits. Coser (1956), in proposition thirteen, explains that conflict behaviors help establish a conflict relationship between antagonists that becomes institutionalized. This means that the nature of conflict behaviors historically used in the firm establishes regulations and norms by which the conflict behavior of organizational members will be guided (Simmel, 1903).

Miles and Snow (1978) contend that the relative complexity and simplicity of the internal environment of Prospectors and Defenders likewise results in different conflict behavior habits. This study also contends that organizational members must develop an awareness to these differences of conflict behavior habits. Members of Prospector firms know that they must work with "short, horizontal feedback loops," while members of Defender firms know that they

must work with "long-looped vertical information" (Miles & Snow, 1978, pp. 63, 44). This, coupled with the non-routine, interactive tasks of the Prospector and the routine, functionally discreet tasks of the Defender, suggests that:

$H_6$: In conflict situations between R&D and marketing, Prospectors will use interpersonal conflict behavior styles more than structural mechanisms.

$H_7$: In conflict situations between R&D and marketing, Defenders will use structural mechanisms more than interpersonal conflict behavior styles.

***Constructiveness of Conflict.*** The current paradigm in conflict research holds that conflict can generate both positive and negative results. Organizations cannot eliminate conflict and, according to the paradigm, should not want to. They stand best to gain by fostering a productive outcome from conflict. Barker, Tjosvold and Andrews (1988) developed a scale to measure what they call the constructiveness of conflict. This scale assesses whether conflict has made the individual work harder, feel energized, and believe that positive change has taken place.

It would be logical to assume that conflict behavior styles may have varying relationships to the constructiveness of conflict. For instance, Thomas and Kilmann (1975) found that conflict behavior styles have a distinct social desirability ranking. The ranking in descending order is integrating, compromising, accommodating, forcing and avoiding. Based on this ranking, people respond more favorably to the cooperative conflict behavior styles than the non-cooperative (or self concerned) conflict behavior styles. In examining interdepartmental conflict, Lawrence and Lorsch (1967) also found that the more collaborative styles of conflict behavior produced positive, functional results. Burke (1970) affirms this. Tjosvold (1982) found avoiding to be associated with negative outcomes. Therefore, we believe that:

$H_8$: In conflict situations between R&D and marketing, a positive association will be found between integrating, compromising, and accommodating conflict behavior styles and the constructiveness of conflict.

$H_9$: In conflict situations between R&D and marketing, a negative association will be found between forcing and avoiding conflict behavior styles and the constructiveness of conflict.

Positive or functional outcomes from conflict serve a number of purposes within organizations. Simmel (1903) would probably have contended that the most obvious purpose, from the point of view of the sociology of business firms, is establishing the identity and boundaries of work groups created by division of labor. Secondly, perhaps, he might have contended that another important purpose is to release tension within organizations--thereby allowing groups to survive differences over time. Today's business managers probably would ask for something more immediate like an improvement in the bottom line. Souder's work speaks strongly to the relationship that exists between negative conflict situations and new product success. Also, Barker, Tjosvold and Andrews (1988) found with an engineering group in Canada that positive outcomes of conflict correlate with new product project success. Thus, we propose that:

$H_{10}$: In conflict situations between R&D and marketing, a positive association will be found between the constructiveness of conflict and new product development success.

Researchers in conflict have generally recognized the importance of a moderate level of conflict for some time (Pondy, 1967; Rahim & Bonoma, 1979; Robbins, 1974). They know that too little conflict within an organization leads to stagnation and an inability to adapt to a rapidly changing business environment (Robbins, 1974). On the other hand, they acknowledge that too much conflict also has negative consequences, as well evidenced in the R&D/marketing interface by the work of Souder. Lewicki, Weiss and Lewin (1992) point out, however, little evidence of the inverted-U relationship of conflict to performance (See Figure 6, p. 12), exists in empirical form. Given that the inverted-U relationship forms one of the basic, underlying assumptions of

today's conflict research and wanting to provide additional empirical data to clarify this point, we hypothesize that:

$H_{11}$: In conflict situations between R&D and marketing, constructiveness of conflict will be associated with moderate levels of conflict.

## Summary

Chapter Four has tendered a review of the needs of the conflict research area at present. These needs include concerns about modeling, empirical research, the normative versus descriptive issue, context, cooperation bias and the absence of "how" practitioners can achieve the "what" that researchers have prescribed. A case has been made for how this study will address each of these concerns. A perceptual context model has provided a general framework for asking some preliminary research questions. Finally, the chapter offered hypotheses dealing with expected relationships as suggested by the literature.

# CHAPTER 5

## Methodology

### Introduction

Chapter 5 will present the research methodology for this study. First the chapter will present a summary of the hypotheses introduced in Chapter 4. Next it will cover the reasoning behind the selection of the research setting and the instrument development. These sections will be followed by a presentation of the measurement scales used. The chapter ends with a plan for the analysis of the data.

### Discussion of Research Hypotheses

Substantial research in the R&D/marketing interface since the middle of the 1970s has alerted managers to the problems that new product development can encounter as a result of poorly managed relations between these two functional areas. Yet, having said that highly conflictful relationships in the interface can damage new product productivity, researchers have provided few prescriptions for how to create an organization that has a healthy "conflict quotient." Most experts agree that conflict will not go away, and that conflict has positive as well as negative ramifications for organizations. The issue now is how to help managers manage conflict successfully.

In moving toward helping managers with this problem, this study looks at two very key parts of conflict within the organization--conflict handling mechanisms and the strategy driving new product development. Firms do not often completely remake themselves. They tend for long periods of time to follow a certain type of strategy. That strategy impacts on relationships. Those relationships are shaped by various factors, among them behaviors and firm structure.

Levels of conflict might vary depending on strategic type, as might the behavioral and structural methods of handling conflict used when it arises. Managers would benefit from knowing what conflict behaviors are associated with certain strategies. This would provide a baseline for managers to recognize the behaviors that are more prevalent in their organizations when following a given new product strategy. Likewise, understanding the relationship between those conflict behaviors and positive outcomes in new product development would benefit the manager in developing an effective new product development process.

***Strategy and Conflict.*** Miles and Snow (1978) present two pure strategic types, Prospectors and Defenders (Hambrick, 1982). In essence these strategic positions are the equivalent of aggressive versus non-aggressive new product development. The Prospector, because of its multiple product lines and decentralized nature, must make special efforts to deal with its complex subunit relationships. Compared to the Defender, conflict in the Prospector tends to be spread around the organization, because so many individuals and groups seek to generate ideas that disagreements often occur. Simple mechanisms to handle conflict fail to meet the substantial needs of the Prospector (Miles & Snow, 1978), but necessity forces the Prospector to develop superior communication skills to compensate.

The Defender, on the other hand, has low levels of uncertainty (routine interactions) and has structural conflict mechanisms (formalization and centralization) built into the firm. These native characteristics help to automatically control conflict. In fact, the need for handling conflict situations is inherently reduced within Defender firms. Counterbalancing the natural conflict managing mechanisms, however, is the breakdown of communication skills in Defender companies. Because of non-lateral management Defenders do not see the need of

well-developed communication skills and, therefore, tend not to develop these skills within their organizations. The above concerns led to the predictions stated in Chapter 4:

$H_1$: In conflict situations between R&D and marketing, Defenders will have a higher perceived level of conflict than Prospectors.

$H_2$: In conflict situations between R&D and marketing, Prospectors will use accommodating, compromising, and integrating conflict behaviors more than Defenders.

$H_3$: In conflict situations between R&D and marketing, Defenders will use forcing and avoiding conflict behaviors more than Prospectors.

$H_4$ In conflict situations between R&D and marketing, Prospectors will rely on formalization more than Defenders.

$H_5$: In conflict situations between R&D and marketing, Prospectors will rely on centralization more than Defenders.

$H_6$: In conflict situations between R&D and marketing, Prospectors will use behavioral conflict handling methods more than structural mechanisms.

$H_7$: In conflict situations between R&D and marketing, Defenders will use structural mechanisms more than behavioral methods.

***Constructive Conflict.*** Although past research has alerted firms to the problems that new product development can encounter as a result of destructive conflict relationships, little has been done to learn more about achieving positive outcomes of conflict. Also, little research has been done to relate actual conflict handling behaviors to the constructiveness of conflict in the new product development process. Effective managers need to assess the conflict behaviors that are more prevalent in their organizations and determine whether these behaviors promote a healthy new product development process. Likewise, managers need to know that there is a link between constructive conflict and new product success. Affirmation of this link would indicate that managers need to understand constructive conflict outcomes, how to engender the behaviors

that will create these outcomes, and how using certain conflict behaviors within the firm can lead to a more effective new product development process.

Barker, Tjosvold, and Andrews (1988) have developed an initial constructive conflict instrument. This instrument simply measures the level of constructive outcomes resulting from conflict within the organization. The relationship between conflict behaviors and constructive conflict is suggested by a number of broader organizational studies, as well as by specific conflict behavior research ( Lawrence & Lorsch, 1967; Thomas & Kilmann, 1975; Tjosvold, 1982). Thus, based on the reviewed literature Chapter 4 predicted the following relative to constructive conflict:

$H_8$: In conflict situations between R&D and marketing, a positive association will be found between integrating conflict handling behaviors and constructive conflict.

$H_9$: In conflict situations between R&D and marketing, a negative association will be found between forcing and avoiding conflict behavior styles and constructive conflict.

$H_{10}$: In conflict situations between R&D and marketing, a positive association will be found between the constructive conflict and new product development success.

$H_{11}$: In conflict situations between R&D and marketing, constructive conflict will be associated with moderate levels of conflict.

## Research Environment

The setting chosen for this study is the new product development process in highly competitive firms. Specifically, the research is carried out in the interface between R&D and marketing (in the new product development process) by surveying marketing and R&D managers in the electronic industries. The chief variables of interest in the study deal with organizational conflict.

The interface between R&D and marketing provides a logical place to research conflict in new product development (Souder, 1987). The interface by its very nature engenders conflict. This is so because the new product development process spans functional areas, is driven by intense competition with other companies in the industry, and inherently means adaptation and change as "new" products are developed. The effects of a volatile internal environment on organizational conflict were reviewed in Chapter 3.

Volatility affecting organizational conflict can also arise from the external environment. Lawrence and Lorsch (1967) and Miles and Snow (1978) carried out extensive organizational studies in multiple industries. These studies showed a key component of conflict to be uncertainty brought about by highly volatile business environments. Both teams of researchers found that conflict and conflict handling in such environments positively or negatively impact the organization depending on personnel behaviors. Rahim (1986) states that under ordinary business circumstances managers may spend as much as 25 percent of their time handling conflict. Thus, managers in volatile industries would likely have a greater conflict managing dilemma than managers in more stable industries.

Selecting the R&D and marketing interface in the electronic industries for the setting of the study provides both a volatile internal and external environment. This benefits the study in several ways. First, the volatility of the environment fosters conflict, providing the appropriate climate for conflict research. Next, the volatile nature of the environment also creates an imperative for managers to participate, because of their greater need in handling conflict within their firms. The use of R&D and marketing managers provides personnel who are knowledgeable about the new product development process and view themselves as performing a representative role for their respective functional areas.

The selected research setting had one potential drawback. Although a volatile business environment provides an excellent place to do conflict research, it also means that managers in highly competitive industries are more likely to be over-surveyed, more likely to have time constraints that prevent participation, and more likely to fear data integrity because of highly proprietary new product development information.

## Instrument Development

***Pretest.*** Information from previous research was used to construct a first draft of the questionnaire to be used in the study (information on the measures used is presented later in the chapter). The questionnaires were pretested to verify the following:

1. that the average respondent could readily understand the questions;
2. that the constructs being measured would allow the resulting data to answer the research questions;
3. that the format aided the respondent in answering the questions;
4. that the questionnaire had adequately dealt with order bias and double-barreled questions;
5. that the instructions were clear;
6. that all important questions had been asked;
7. that questions were relevant;
8. that respondents could answer the questions asked;
9. that the time needed to fill out the questionnaire was within reasonable limits and could be quantified.

116 marketing and R&D/engineering personnel from seven firms participated in pretesting the initial instrument. These firms represented the following industries: chemicals, fiber, medical supplies, metal production, consumer electronics, utilities, and clothing manufacture. Because the pretest used established and well-validated scales, initial focus groups

and pretesting to develop the scale items were not necessary. Instead, company personnel filled out an initial questionnaire and wrote down their reactions to the survey. These responses were carefully analyzed for information to assist in necessary revisions for the final questionnaire.

To confirm the applicability of the established scales to this particular study, four of the seven firms were asked to participate in focus groups with the researcher. These four focus groups were held (averaging 8 company participants each) at four different company headquarters and were 45 to 90 minutes long. At these meetings company personnel answered the questionnaires and afterwards discussed the questionnaire in a loosely structured format. Participants were encouraged to express their reactions to the questionnaire format and content. Several direct questions were also asked, covering survey content (constructs), format, instructional clarity, item clarity, relevance, and time needed to complete the survey.

The pretest indicated that there were some adjustments needed on the survey. Several of the items used to measure constructs were found to have language that was "too academic." Suggestions were requested for improvement of the final questionnaire. Also, focus group participants uniformly agreed that confidentiality was a critical issue due to the sensitive nature of the questions being asked. Several additional questions on conflict were suggested by the participants. Overall, however, the subjects felt that the instructions were clear and the questions asked were clear, relevant, and comprehensive. Subjects were timed while they answered the survey and were found to use an average of 25 minutes to complete it. When asked about the length of the questionnaire, focus group participants found it substantial, but not too long if the companies participating would gain meaningful feedback from the study.

Additionally, factor analyses and coefficient alphas were run on the scales constructed for the pretest questionnaire. Initial analysis of the pretest questionnaire scales indicated that all

scales were substantially over .70 (exceeding the minimum level cited by Nunnally, 1978) with the exception of the avoiding and forcing scales for conflict behaviors. Consequently, six additional items of "equal kind and quality" were added to the avoiding and forcing scales in the final survey (Kerlinger, 1986). Initial factor analysis of the pretest survey substantiated the predicted item relationships and, thus, the validity of the previously used scales.

Based on the pretest, the pretest questionnaires gathered appropriate data to meet the study's research goals. Data gathered for the pretest were not used for the dissertation analyses.

***Final Instrument.*** The Dillman Total Design Method (TDM) was used for the development of the final instrument (See Appendix 1 for the complete instrument). The survey, once pretested and revised, was made into a twelve-page, reduced (7" x 8.5") booklet. The administration of the final survey also followed Dillman's TDM. Four mailings were carried out. The first mailing packet contained a letter to the marketing director of the company (or in some instances to the CEO or another manager of the company, based on recommendations provided during phone contact with the company), two surveys, and two postage paid pre-addressed return envelopes. The company contact was asked to fill out one questionnaire and pass the other one to his/her counterpart in R&D/engineering or to direct the surveys to the appropriate people within their organization. Either personnel, R&D/engineering or marketing, were considered able to intelligently answer questions on conflict between their two areas in the new product development process. A follow-up letter was mailed one week after the initial packet was sent. This was followed two weeks later with a second packet containing a reminder letter and two additional surveys with return envelopes. A third mailing, a general reminder letter urging respondents to complete the surveys, followed three weeks later (See Appendices 2-5 for sample letters).

## Sample Selection

The prospective participants in this study were identified through the Electronic Industries Association' s (hereafter EIA) *1994 Trade Directory and Membership List (*May edition). The participants needed to be currently employed in either the R&D/engineering or marketing departments of firms in the electronic industries. The key criteria for inclusion of a company were : 1) U.S. based production; 2) production of physical goods; 3) departmentalization of the marketing and R&D functions; and 4) marketing and R&D/engineering departments that work closely together. Thus, the following companies and their personnel were eliminated from the prospective participant list:

1. Companies having fewer than 30 employees
2. Service companies
3. Software platform producers
4. Distributors
5. Foreign manufacturers
6. Consulting firms
7. Market research firms

Using the above criteria 800 companies and their employees were identified as possible prospects from the EIA membership listing. Firms providing sufficient information in their listing to ostensibly meet the criteria were not contacted. Those with obviously insufficient information, a total of 631 companies, were contacted by phone to verify address, location of manufacturing, existence of both a marketing and R&D/engineering department., and the name of their marketing director as the contact person for the study. Adjusted for company mortality, personnel attrition, incorrect or unusable addresses, and subsequent failure to meet study criteria

the final sample frame included personnel from 727 eligible companies in the electronic industries.

The electronic industries comprise those organizations that manufacture, design (or develop), and/or assemble electronic equipment, systems, or components. The Electronic Industries Association (EIA) organization was originally chartered as the Radio Manufacturers Association in 1924. The organization assumed its current title in 1957. As stated by the organization, EIA seeks to enhance public awareness of the electronics industry, to provide a liaison between industry and government, to develop and disseminate technical standards, to collect a variety of marketing data, to collect and disseminate information to the industry, to lobby for industry interests, to promote the use of electronic teaching aids, and in general to enhance competitiveness within the electronic industries. EIA represents ten administrative groups including four manufacturing groups--the electronics information group, the components group, the industrial electronics group, and the consumer electronics group. The study's sample is drawn from these four manufacturing groups.

A more commonly used classification of firms is provided by the U.S. Government in the form of Standard Industrial Classification (SIC) numbers in the *Standard Industrial Classification Manual* (1987). The electronic industries represent ten possible different SIC codes as assigned by the U.S. government. The SIC classifications for the electronics industry are:

1. Electric transmission and distribution equipment (SIC 361)
2. Electric lighting and wiring equipment (SIC 364)
3. Household audio/video equipment and audio recordings (SIC 365)
4. Electronic components and accessories (SIC 367)

5. Industrial/commercial machinery and computer equipment (SIC Major Group 35)
6. Electrical industrial apparatus (SIC 362)
7. Household appliances (SIC 363)
8. Instrumentation (SIC Major Group 38)
9. Telecommunications equipment (SIC 366)
10. Miscellaneous machinery, equipment, and supplies (batteries, recording equipment, electrical equipment for internal combustion engines, magnetic and optical recording media) (SIC 369)

In order to define the respondents participating in the study (given that there is no demographics section to the survey), each respondent was asked to indicate the primary business their firm pursues by choosing one of the ten SIC descriptions listed above. The resulting profile of the study respondents is provided in Chapter 6.

## Measurement Scales

This section presents the twelve measurement scales used in this research to study the constructs of interest. All twelve scales have been validated in previous research studies. All questions administered in the study questionnaire were answered on a 1 to 7 scale, with 1 being "strongly disagree" and 7 being "strongly agree." The ensuing discussions of the scales follow their order in the survey instrument.

***Conflict Levels.*** In order to work with conflict issues it is necessary to establish that conflict exists within the organization. Many researchers have used conflict measurements in a variety of educational, psychological, and organizational research settings. The measures used in this study come from the market orientation study by Jaworski and Kohli (1993) and the Ruekert and Walker (1987) study of a single Fortune 500 company's business strategy. These particular measures were chosen because each of these studies deals with organizational conflict and

specifically interdepartmental conflict. The Ruekert and Walker (1987) study dealt specifically with conflicts arising in the interface between R&D and marketing units (See Table 11).

***Conflict Handling Behavior.*** The quantitative measurement of conflict handling behavior in organizations dates back to the early 1960s. In particular the work of Blake and Mouton (1964) has strongly influenced the measurement of behavioral constructs. Virtually all current measurements are based on the trade-off between interest in self and others as described by Blake and Mouton (1964), Thomas and Kilmann (1974), and Rahim (1983). This study uses the five scales developed and refined by Rahim in his organizational inventory of conflict behaviors. These scales measure integrating behavior, accommodating behavior, compromising behavior, avoiding behavior, and forcing behavior (See Tables 12 through 16). In reality, these scales measure three behavioral orientations: 1) varying levels of integrating behavior; 2) avoiding behavior; and 3) forcing behavior.

***Constructive Conflict.*** The idea of positive conflict has floated in and out of the conflict paradigm over the last century. Currently, the conflict research paradigm holds that there can be either positive or negative outcomes from conflict situations as demonstrated by the model of conflict presented earlier. Although there can be a variety of both positive and negative outcomes to conflict, one positive outcome of conflict is the constructive results it can have for those participating in the conflict. This particular positive outcome should have meaning for organizations because of its practical utility. In this study, constructive conflict was measured using a scale developed by Barker, Tjosvold, and Andrews (1988) for a study evaluating cooperation and conflict among engineers in a single matrix organization (See Table 17). The scale looks at task outcomes and emotional outcomes as a result of conflict taking place in crossfunctional project management.

## TABLE 12
## Construct Framework: Integrating Behavior

| Measure Used | Source | Selected Cites |
|---|---|---|
| **Integrating:**<br><br>Try to bring all issues into the open in order to resolve them in the best way.<br><br>Encourage others to express their feelings and views fully.<br><br>Try to investigate an issue in order to find a solution agreeable to us both.<br><br>Work hard to thoroughly, jointly learn about the issues.<br><br>Try to present a single position as only one of many possible points of view.<br><br>Exchange complete and accurate information in order to help solve problems.<br><br>Openly share concerns and issues. | Rahim 1983 | Pozner 1986; Pearce 1987; Zerbe 1987; Barker 1988; Vandevli 1990; Sitkin 1993 |

## TABLE 13
## Construct Framework: Accommodating Behavior

| Measure Used | Source | Selected Cites |
|---|---|---|
| **Accommodating:**<br><br>Do all we can do to achieve harmony.<br><br>Go along with the suggestions of others.<br><br>Try to satisfy the expectations of others.<br><br>Try to help others not "lose face" when there is a disagreement.<br><br>Try to meet each others' schedules whenever we can. | Rahim, 1983 | Pozner 1986; Pearce 1987; Zerbe 1987; Barker 1988; Vandevli 1990; Sitkin 1993 |

## TABLE 14
## Construct Framework: Compromising Behavior

| Measure Used | Source | Cite |
|---|---|---|
| **Compromising:**<br><br>Stress the importance of "give and take."<br><br>Look for middle ground to resolve disagreements.<br><br>Negotiate to achieve goals<br><br>Arrive at compromises that both areas can accept.<br><br>Propose compromises in order to end deadlocks.<br><br>Go the "extra mile" to get along with each other. | Rahim, 1983 | Pozner 1986; Pearce 1987; Zerbe 1987; Barker 1988; Vandevli 1990; Sitkin 1993 |

## TABLE 15
## Construct Framework: Avoiding Behavior

| Measure Used | Source | Selected Cites |
|---|---|---|
| **Avoiding:**<br><br>Try to keep differences of opinion quiet.<br><br>Avoid openly discussing disputed issues.<br><br>Try not to get mixed up in conflict.<br><br>Try to keep anger and frustration from being expressed.<br><br>Believe it is better to keep feelings to ourselves rather than create hard feelings.<br><br>Smooth over conflicts by trying to ignore them.<br><br>Look for ways to bypass unpleasant exchanges.<br><br>Avoid being put "on the spot" by keeping conflict to ourselves.<br><br>Try to stay away from agreements. | Rahim, 1983 | Pozner 1986; Pearce 1987; Zerbe 1987; Barker 1988; Vandevli 1990; Sitkin 1993 |

## TABLE 16
## Construct Framework: Forcing Behavior

| Measure Used | Source | Selected Cites |
|---|---|---|
| **Forcing:**<br><br>Try to put a single area's needs first.<br><br>Stick to initial positions to get each other to compromise.<br><br>Tenaciously argue the merit of initial positions when disagreements occur.<br><br>Want the other to make concessions, but don't want to make concessions ourselves.<br><br>Look for faults in each other's initial positions.<br><br>Treat issues in conflict as a win-lose contest.<br><br>Enjoy winning an argument.<br><br>Overstate the needs and positions in order to get our way.<br><br>Are firm in pursuing one side of an issue. | Rahim, 1983 | Pozner 1986; Pearce 1987; Zerbe 1987; Barker 1988; Vandevli 1990; Sitkin 1993 |

## TABLE 17
## Construct Framework: Constructive Conflict

| Measure Used | Source | Selected Cites |
|---|---|---|
| Work harder because of the conflicts that we have.<br><br>See constructive changes occur on projects because of conflicts.<br><br>Know each other better because of the way conflicts are handled.<br><br>Are more sensitive to one another because of the way that conflicts are handled.<br><br>Feel energized, ready to get down to work after a conflict.<br><br>Feel hostile toward each other after a conflict. *<br><br>* Item reverse scored | Barker, Tjosvold, & Andrews 1988 | Tjosvold 1988; Tjosvold 1990; Ford 1992 |

***Crossfunctional Relationship Success.*** While constructive conflict is an immediate outcome of interest to organizations, ultimately within the new product development process the desired outcome must be new product process success. For the purposes of this study, new product process success is measured in two ways. First, the success of new product process relationships is measured. The logic for this is the influence that relationships have, not only on the current new product development project, but also on the those that follow. Conflict history and climate affect succeeding new product efforts. The scale used to measure interface relationship success was also taken from the Barker, Tjosvold, and Andrews (1988) study (See Table 18). The second measure of new product process success is a more traditional measure of new product success taken from the PIMS study (Buzzell & Chang, 1983) and Song (1991, 1993). This scale assesses competitiveness, market share, the degree to which new product objectives are met, profitability, quality, price, breadth of product line, and new product introduction timing (See Table 19).

***Structural Conflict Handling.*** Structural conflict handling occurs in two fashions within the organization (Ruekert & Walker, 1987). The first is that organization structures can reduce the chance that conflict between groups happens in the first place. The second is that organization structures can also be used to resolve conflicts. McCann and Galbraith (1981) cite formalization to be the most commonly used structural method to prevent interdepartmental conflicts. They suggest that centralization hurts conflict resolution by taking it out of the hands of the parties involved, but helps conflict resolution by efficiency and time saved. Thus, a formalization scale and a centralization scale are used in this study to measure structural conflict handling. Each of the scales used is drawn from a study by Hage and Aiken (1967) (See Table 20).

## TABLE 18
## Construct Framework: Crossfunctional Relationship Success

| Measure Used | Source | Selected Cites |
|---|---|---|
| We feel very satisfied in our work with each other.<br><br>We feel a strong commitment to working with each other on new product development.<br><br>We have a high degree of trust in each other.<br><br>The way we work together inspires all of us to better job performance.<br><br>We feel highly committed to joint work with each other on new product development.<br><br>All things considered, we feel highly pleased with the way in which we work together on new product development.<br><br>The way we work together makes us think seriously about quitting new product projects. *<br><br>* Item reverse scored | Barker, Tjosvold, & Andrews 1988 | Tjosvold 1988; Tjosvold 1990; Ford 1992 |

**TABLE 19**
**Construct Framework: New Product Success**

| Measure Used | Source | Selected Cites |
|---|---|---|
| Overall, our company is one of the most successful in the industry.<br><br>Our overall performance of our new product program has met our objectives.<br><br>From an overall profitability standpoint, our new product development program has been successful.<br><br>Compared to major competitors, our overall new product program is far more successful.<br><br>Compared to our major competitors, our new product development cycle time has been relatively less.<br><br>Our product-line breadths are much broader than those of our competitors.<br><br>The overall quality of our new products is higher than that of our competitors.<br><br>The overall price of our new products is higher than that of our competitors. *<br><br>The timing of our product introduction is good.<br><br>Our company has relatively high market shares.<br><br>Our new product development costs generally stay within our budgeted costs.<br><br>* Item reverse scored | Song 1991,1993;<br>Buzzell & Chang 1981 | Day 1983; Raj 1985;<br>Campbell 1986;<br>Cowley 1988;<br>Patterson 1993 |

**TABLE 20**
**Construct Framework: Structural Conflict Handling**

| Measure Used | Source | Selected Cites |
|---|---|---|
| **Formalization**<br><br>Written procedures and guidelines are available for most work situations.<br><br>Formal communications channels have been established.<br><br>Written documents, such as budgets, plans, and schedules, are an integral part of the job.<br><br>Performance appraisals in our organization are based on written performance standards.<br><br>Duties, authority, and accountability of personnel are documented in policies, procedures, or job descriptions. | Hage & Aiken 1967 | Dwyer 1985; Kim 1988; Poole 1989; Barclay 1991; Ostroff 1993 |
| **Centralization**<br><br>Any decision I make has to have my boss' approval.<br><br>There is little action taken here until a supervisor approves a decision.<br><br>Even small matters have to be referred to someone higher up for a final answer.<br><br>A person who wants to make his own decision would be quickly discouraged here.<br><br>I have to ask my boss before I do almost anything. | Hage & Aiken 1967 | Dwyer 1985; Kim 1988; Poole 1989; Barclay 1991; Ostroff 1993 |

***Firm Strategy.*** A chief concern of this research is the effect of strategy on conflict in the R&D/marketing interface. A number of classifications of strategy are used throughout the organizational literature. Miles and Snow's (1978) typology offers a particularly useful classification for new product development research, because the typology is driven by product domain and product domain development. For this study, an adaptation of the Conant, Mokwa, and Varadarajan (1990) Miles and Snow typing scale is used. Their scale included eleven items, each with four possible responses (Prospector, Defender, Analyzer, or Reactor). The eleven Prospector responses were drawn from their scale and used to construct a new scale measuring how Prospector-like a firm might or might not be (See Table 21).

***Demographics.*** A demographics section was intentionally left out of the study questionnaire. Based on information from the focus group participants and from the literature, confidentiality was critical in order to ensure that R&D and marketing personnel participate and that they provide unbiased responses.

## Data Analysis Plan

This section presents a model of the analysis process used in the study and the specific analysis techniques and procedures used to test the model and the hypotheses. Figure 10 presents the model.

***Data Preparation.*** To prepare the data for analysis, all surveys were careful reviewed for inclusion in the study. All data were keyed directly into a computer data file and were verified. Because all data were quantitative, a general frequencies program was run to check for inconsistencies in the data set, looking for inappropriate ranges, impossible means, questionable standard deviations, and excessive missing values. All analyses were done using the SAS Institute, Inc. statistical package, Version 6.

## TABLE 21
## Construct Framework: Firm Strategy

| Measure Used | Source | Selected Cites |
|---|---|---|
| In comparison to our competitors, the products we provide our customers are more innovative, and continually changing.<br><br>In contrast to our competitors, my organization has an image in the marketplace as a firm that has a reputation for being innovative and creative.<br><br>My firm spends significant amounts of time continuously monitoring the marketplace for changes and trends.<br><br>In comparison to our competitors, the increases or losses in demand which we have experienced are due most probably to our practice of aggressively entering new markets with new types of products.<br><br>One of this firm's key goals relative to its competitors is availability of the people, resources, and equipment required to develop new products and markets.<br><br>In contrast to our competitors, our managerial employees exhibit competencies (skills) that are broad, entrepreneurial, diverse, and flexible--enabling change to be created.<br><br>The one thing that protects my organization from its competitors is that we are able to consistently develop new products and new markets.<br><br>Our management staff concentrates on developing new products, new markets and new market segments more than many of our competitors.<br><br>In contrast to many competitors, my organization identifies marketplace trends and opportunities that can result in product offerings new to the industry or able to reach new markets.<br><br>In comparison to our competitors, the structure of my organization is product or market oriented.<br><br>Unlike our competitors, our company procedures to evaluate performance are decentralized and participatory, encouraging many company members to be involved. | Conant, Mokwa, & Varadarajan 1990 | Blair 1991; Kerin 1992; Doty 1993; Dvir 1993; Zahra 1993; Conant 1994 |

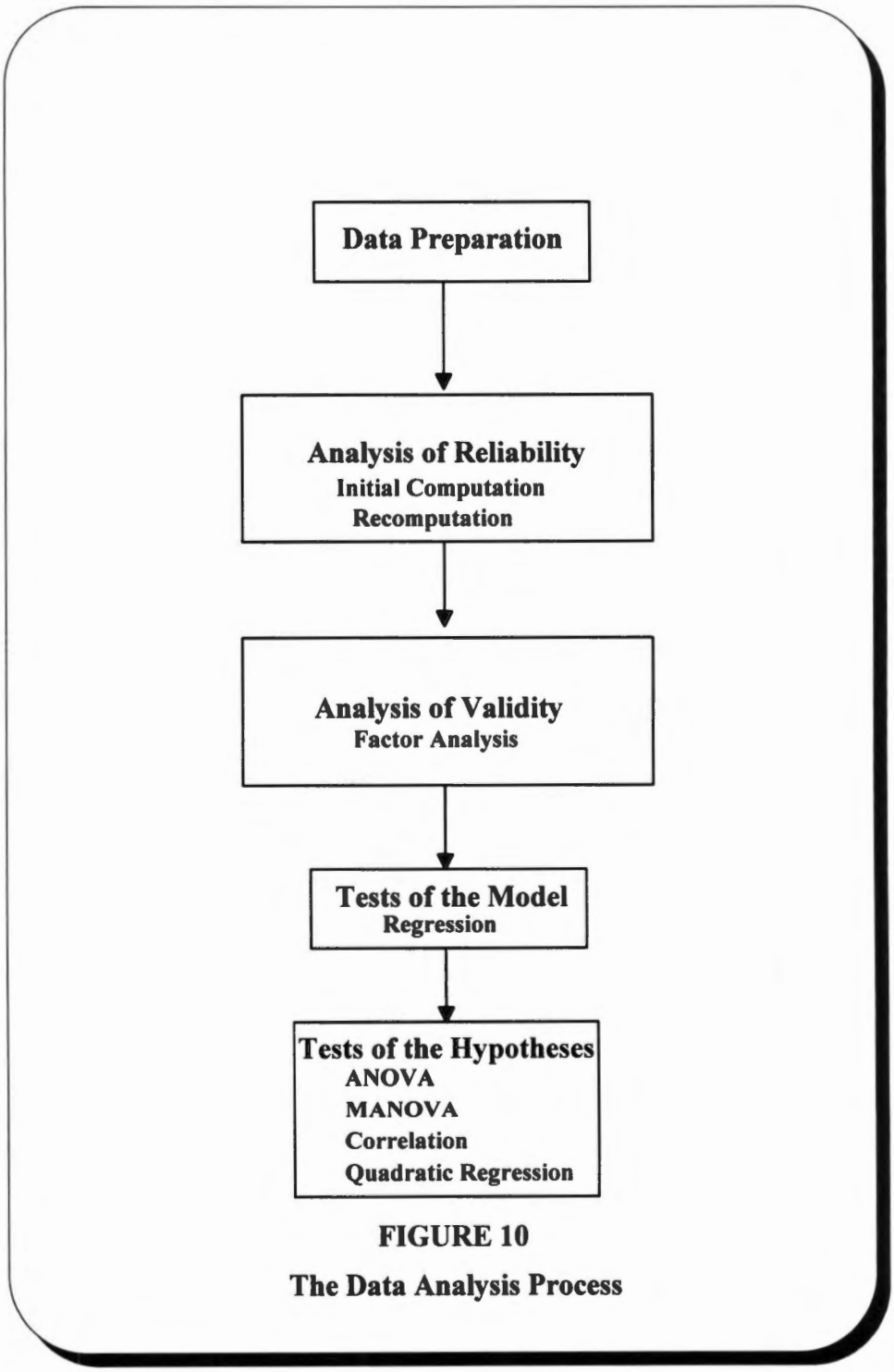



**FIGURE 10**

**The Data Analysis Process**

***Analysis of Reliability.*** For a measure to have meaning it must be reliable. Reliability is defined as the degree to which items on a survey are free from measurement error and therefore produce consistent results. The theory of reliability states that a given set of measures has a total variance. This variance includes both true (systematic) and error variance. The greater the error variance of a measure the smaller the reliability. The greater the true variance, the greater the reliability and the more perfect the measure. Kerlinger's (1986) *maxmincon principle* was used in this study to maximize true variance and minimize error. This included striving to refine items to eliminate ambiguity and to provide clear, standard instructions. Additionally, more items of equal kind and quality were added to two of the conflict behavior scales after the pretest to improve reliability. Finally, the most commonly used technique for assessing the precision of a measuring instrument, coefficient alpha, was calculated on the scales used in the study. Coefficient alpha provides a measure of the proportion of the total variance that is attributable to true variance.

***Analysis of Validity.*** For a measure to have meaning it must also have validity. When measuring simple attributes and properties in the physical sciences, validity presents few problems. However, in the social sciences much of measurement is indirect, demanding that researchers question whether they are indeed measuring what they intend to. The questions asked in this study are indirect measures. Therefore, validity must be established. Part of establishing validity in this study has been accomplished by using measures that have been successfully used in previous research efforts. Other researchers have found that the measures used in this study have content validity, or sampling adequacy. Construct validity is confirmed directly in this study by factor analysis. Both content validity and construct validity provide the necessary convergence, i.e., evidence from different sources that the constructs have the same

meaning, to assure validity. Discriminant validity is provided by examination of the correlation matrix of the constructs.

***Model and Hypothesis Testing.*** The model presented in the study was tested using two-stage regression to assess how much of the variation of the dependent variable was due to the independent variables. Hypotheses 1 through 5 look at the differences that might be expected between Prospectors and Defenders in their use of conflict handling mechanisms. These hypotheses were tested for significance differences between groups using interval dependent variables and nominal independent variables. Testing of the hypotheses assumes normal distribution of the interval variable in the population and homoscedasticity across levels of the independent variable. Thus, ANOVA was used to test the univariate Hypotheses 1, 2, 4, and 5. MANOVA was used to test the multivariate Hypothesis 3.

Hypothesis 6 and Hypothesis 7 ask how Prospectors and Defenders differ in their use of behavioral and structural conflict handling techniques. Hypotheses 6 predicted that Prospectors would use behavioral conflict handling mechanisms more than structural conflict handling mechanisms based on the reasoning provided in Chapter 4. Hypothesis 7 predicted that Defenders would use structural conflict handling methods more than behavioral methods. These two hypotheses were tested using repeated measure MANOVA and looking at the direction of the means.

Hypotheses 8 through 10 predict simple associations between two continuous variables. As such, assuming a linear relationship and interval scales, Pearson product-moment correlations provide the correct measures of association to test these hypotheses (Haber & Runyon, 1988). Finally, Hypothesis 11 predicts the association of constructive conflict with moderate conflict levels. First, moderate conflict was defined and used to group the responses into moderate and

non-moderate classifications. Constructive conflict responses were plotted against the moderate conflict responses and visually assessed. Additionally, a t-test was used to compare the mean of the moderate conflict group with the constructive conflict response mean. Finally, a quadratic regression test was run to test for a curvilinear relationship between constructive conflict and moderate conflict.

Each of the hypothesis tests was based first on the total combined responses of the R&D and marketing personnel. Subsequently, the analyses were run only on the R&D responses, and finally only on the marketing responses.

## Summary

Chapter 5 has presented a summary of the study hypotheses, the reasoning behind the selection of the research setting, the instrument development and administration, the measurement scales used, and the basic plan for data analysis. For the purposes of researching conflict within the new product development process, it was deemed appropriate to select a sample of respondents working in the R&D/marketing interface within volatile industries where conflict is rife and threatens productivity. Thus, 727 firms within the electronic industries, specifically members of the EIA, were asked to participate in the study. An instrument using established measures was constructed (based on the Dillman Total Design Method) and pretested with 116 participants from 7 companies. The final instrument was sent to both marketing and R&D personnel within electronics firms to assess their impressions of conflict, conflict behaviors, and conflict outcomes between the two functional areas. Chapter 6 presents the data analysis and the results of the model and hypothesis testing.

# CHAPTER 6

## Analysis and Results

### Introduction

This chapter presents the data analysis and results. The first section presents the sample profile. The next section discusses the steps taken to prepare the data set for analysis, including reliability and validity checks. The last section summarizes the results of the model and tests of the hypotheses (See Appendix 6 for a summary of steps used in the analysis).

### Sample Profile

As discussed in Chapter 5, the prospective participants in this study were R&D/engineering and marketing personnel employed by member firms of the Electronic Industries Association' s *1994 Trade Directory and Membership List (*May edition). Of the 800 companies and their employees initially identified as possible prospects from the EIA membership listing, 727 firms qualified for participation in the study. Personnel in a variety of electronics firms participated (Table 22 provides a breakdown of the primary business of those firms participating in the study and the functional area participation of the firms).

Demographic information is not available on the survey respondents, because the survey did not include a demographics section. Focus group feedback suggested that inclusion of demographics might reduce participation and/or induce bias into subject responses because of the sensitive nature of many of the survey questions.

### Response

After the initial mailing and three follow-ups, personnel from 188 companies responded, or 25.8 % of the companies. Of these companies, a total of 290 R&D/marketing personnel

## TABLE 22

### Response by Primary Business of Participating Firms

| Primary Business (SIC) | Respondents by SIC | Respondent Percentage by SIC | Both Areas Responded | R&D Only Responded | Marketing Only Responded |
|---|---|---|---|---|---|
| Household Audio/Video Equipment/Recordings | 15 | 5 % | 5 | 2 | 3 |
| Instrumentation | 16 | 6 % | 3 | 2 | 8 |
| Electronic Components/ Accessories | 80 | 28 % | 16 | 13 | 35 |
| Telecommunications Equipment | 85 | 29 % | 19 | 14 | 33 |
| Industrial/Commercial Machinery & Computer Equipment | 24 | 8 % | 7 | 4 | 6 |
| Miscellaneous Machinery/ Equipment/Supplies (batteries, recording media, etc.) | 23 | 8 % | 6 | 4 | 7 |
| Others | 47 | 16 % | 5 | 13 | 23 |
| **TOTALS*** | 290 | 100 % | 61 | 52 | 115 |

* One respondent did not identify functional membership.

responded. 176 marketing managers responded, and 113 R&D managers responded, with one survey not indicating functional group membership. All of the marketing manager surveys were usable, and of the R&D/engineering surveys all were usable except two, resulting in a response rate for the study of 20.3 %. 61 companies returned both the marketing and R&D/engineering questionnaires. As mentioned before, respondent demographics were not collected because of the job-threatening nature of many of the questions.

Nunnally (1978) states that response bias in social science research requires researchers to control for this undesirable effect on group response averages. Due to the sensitive nature of the questions being asked in this study, Nunnally's fifth principle of reproducibility was used to control for response bias. Thus, the study's 101 variables were analyzed, first wave against second wave responses, to test for nonresponse bias. First wave responses were defined as those questionnaires returned during the first month after the initial mailing. Second wave responses were defined as those questionnaires returned during the second month following the initial mailing. T-tests were found to be insignificant at $\alpha = .05$ for all 101 variables. It can be concluded from these results that the two groups are similar and that response bias is not operating relative to the sample. The above analysis was conducted using SAS, Version 6, as were all subsequent analyses for data preparation, model testing, and hypothesis testing.

Because the data indicated response bias is unlikely in the study, it is reasonable to consider non-response for this particular study to be a result of a variety of factors cited by various contact people in phone discussions and in letters. Their given reasons have included company policy to not participate in survey studies, transitioning personnel, restructuring companies, work load, time of year (relative to travel and sales efforts) and length of the questionnaire. These factors appear random and do not suggest that certain types of people or

companies would choose to respond to a survey about organizational conflict, while certain other types would not.

## Data Preparation

To prepare the data, the 292 surveys returned in the study were assessed and analyzed in various ways to determine suitability for inclusion in subsequent analysis. A decision rule was established to eliminate all surveys with entire sections left unanswered or with sections that clearly indicated the respondent was responding inappropriately. Based on this decision rule, two surveys were judged to be unusable. In one instance, the respondent answered half of the survey and left the second half blank. In the other instance, the respondent marked the same scale number for all survey items. The remaining surveys had no missing sections and no indications that respondents had answered inappropriately.

This resulted in the data from 290 surveys being keyed directly into a computer data file, and each entry being independently verified. Because the data were quantitative, univariate descriptive statistics were run on the survey responses to check for inconsistencies in the data set, such as unlikely values in ranges, means, and standard deviations, as well as excessive missing values. Ranges, means, and standard deviations revealed no data entry problems.

A decision rule was established to eliminate variables with excessive missing values. A variable with excessive missing values was defined as a variable with more than 10 % of the possible 290 responses missing. The univariate descriptive statistics for the 290 surveys indicated that the maximum number of missing values found for any single variable was four, with only two variables falling into this category. Many variables had only one or two missing values, and 46 % had no missing values at all. Given that the level of missing values was a maximum of 1 % of the possible responses on any given item, missing data points were not

found to be excessive. Therefore, all variables were retained for subsequent analysis. Mean substitutions, which do not change the mean of the variable and have negligible effect on variance, were done for each item with missing values, allowing the use of all 290 responses for each variable in subsequent analyses.

To do a brief, initial validity check of the constructs in the study prior to in-depth analysis, expected theoretical relationships between the constructs were compared to quantitative relationships between constructs revealed by statistical analysis. This was done using correlation coefficients. There are many types of correlation coefficients, e.g., phi coefficient, biserial *r*, tetrachoric *r*, Spearman *r*, Kendall's tau, Multiple *R*, and Pearson's *r*. Selection of a correlation coefficient depends on the type of scale used in measurement, the underlying distribution (continuous or discrete), and whether the distribution of the z-scores is linear or nonlinear. Because the data in this study were interval, continuous, and linear, the Pearson *r*, or the Pearson product-moment correlation coefficient, was selected as the appropriate coefficient correlation procedure for the analyses (Runyon & Haber, 1988).

It should be mentioned that an additional concern for the use of product-moment correlation (expressing the relationship between two variables by standard scores) is homoscedasticity, having approximately the same spread around the best-fitting straight line at all levels of the two variables being considered. This concern is for the interpretability of results. Fortunately, unless severe violations of the assumptions of linearity, normal distribution, and homoscedasticity occur, interpretation is not a real problem (Nunnally, 1978). Scattergrams and regression procedures, including Cook's D and the Belsley, Kuh and Welsch (1980) procedure, to check for outliers, observation influence, and multicollinearity, found no indications of severe violations in the assumption of normality, linearity, and homoscedasticity. Thus, based on the

product-moment correlation coefficients, the relationships found between the constructs supported theoretical expectations, and the constructs were accepted for subsequent analysis.

**Reliability Analysis**

For a measure to be interpretable it must be reliable, i.e., random error has been minimized. Thus, for this study to have meaning it must be demonstrated that the measures used in gathering data are reliable measures. According to Nunnally (1978), the most useful model for consideration of measurement error is the domain-sampling model. This model assumes that any given measure is made up of randomly sampled items from the universe of possible items. This is called sampling of content.

Coefficient alpha measures reliability based on internal consistency. Its formula provides an upper limit to the reliability of measures that have been created under the assumptions of the domain-sampling model (Nunnally, 1978). Thus, in most research situations, coefficient alpha gives a good estimate of reliability because most measurement error arises from the sampling of content (Nunnally, 1978). Coefficient alpha provides a measure of the proportion of the total variance that is attributable to true variance. Although there are sources of measurement error not considered by coefficient alpha, these sources have very little impact on measurement error overall (Nunnally, 1978). Therefore, the most commonly used technique for assessing the precision of a measuring instrument, coefficient alpha, was selected to assess reliability of measures in this study. Tables 23 through 30 present the reliability results for the study (Cronbach's alphas and item-to-total correlations for the multi-item scales used in the study) and the means and standard deviations for the separate items. Table 31 follows with the correlation matrix of the study constructs.

## TABLE 23

### Scale Reliabilities: Conflict Level

| Measure Used | Cronbach's Alpha | Item to Total Correlation | Mean | Standard Deviation |
|---|---|---|---|---|
| There is little or no interdepartmental conflict. * | 0.87 | .62 | 4.72 | 1.52 |
| The objectives pursued by the marketing department are incompatible with those of the R&D department. | | .37 | 2.88 | 1.57 |
| We get along well with each other. * | | .59 | 2.81 | 1.41 |
| People in one department generally dislike interacting with those from the other department | | .49 | 2.73 | 1.55 |
| Employees from the two departments feel that the goals of their respective departments are in harmony with each other. * | | .71 | 4.07 | 1.66 |
| People conflict on how to proceed on tasks. | | .56 | 4.56 | 1.57 |
| People differ on basic goals the two areas should pursue. | | .59 | 3.69 | 1.66 |
| People differ on the best way to accomplish new product goals. | | .52 | 4.79 | 1.46 |
| Employees agree on which tasks are urgent. * | | .55 | 3.82 | 1.72 |
| People conflict over how they should carry out their work. | | .56 | 4.24 | 1.53 |
| Employees from the two departments share the same values. * | | .59 | 3.68 | 1.72 |
| People in the two areas rate the importance of decisions in the same way. * | | .55 | 4.57 | 1.66 |

* Item reverse scored

## TABLE 25

### Scale Reliabilities: Accommodating/Compromising Behavior

| Measure Used | Cronbach's Alpha | Item to Total Correlation | Mean | Standard Deviation |
|---|---|---|---|---|
| **Accommodating:** | | | | |
| Do all we can do to achieve harmony. | .53 | .32 | 4.16 | 1.58 |
| Go along with the suggestions of others. | | .20 | 3.86 | 1.31 |
| Try to satisfy the expectations of others. | | .39 | 4.59 | 1.25 |
| Try to help others not "lose face" when there is a disagreement. | | .27 | 4.57 | 1.31 |
| Try to meet each others' schedules whenever we can. | | .29 | 5.28 | 1.37 |
| **Compromising:** | | | | |
| Stress the importance of "give and take." | .82 | .48 | 4.33 | 1.48 |
| Look for middle ground to resolve disagreements. | | .58 | 4.95 | 1.24 |
| Negotiate to achieve goals | | .59 | 5.17 | 1.19 |
| Arrive at compromises that both areas can accept. | | .71 | 5.15 | 1.28 |
| Propose compromises in order to end deadlocks. | | .64 | 5.39 | 1.17 |
| Go the "extra mile" to get along with each other. | | .52 | 4.66 | 1.34 |

## TABLE 26

### Scale Reliabilities: Avoiding/Forcing Behavior

| Measure Used | Cronbach's Alpha | Item to Total Correlation | Mean | Standard Deviation |
|---|---|---|---|---|
| **Avoiding:** | | | | |
| Try to keep differences of opinion quiet. | .84 | .50 | 2.85 | 1.47 |
| Avoid openly discussing disputed issues. | | .58 | 2.71 | 1.54 |
| Try not to get mixed up in conflict. | | .56 | 3.59 | 1.58 |
| Try to keep anger and frustration from being expressed ** | | .24 | 4.23 | 1.64 |
| Believe it is better to keep feelings to ourselves rather than create hard feelings. | | .59 | 3.44 | 1.64 |
| Smooth over conflicts by trying to ignore them. | | .57 | 2.92 | 1.57 |
| Look for ways to bypass unpleasant exchanges. | | .56 | 3.88 | 1.52 |
| Avoid being put "on the spot" by keeping conflict to ourselves. | | .63 | 2.96 | 1.38 |
| Try to stay away from agreements. | | .55 | 3.39 | 1.45 |
| **Forcing:** | | | | |
| Try to put a single area's needs first. | .81 | .39 | 3.35 | 1.67 |
| Stick to initial positions to get each other to compromise. | | .44 | 3.71 | 1.48 |
| Tenaciously argue the merit of initial positions when disagreements occur. | | .56 | 3.71 | 1.63 |
| Want the other to make concessions, but don't want to make concessions ourselves. | | .66 | 3.38 | 1.56 |
| Look for faults in each other's initial positions. | | .48 | 3.97 | 1.59 |
| Treat issues in conflict as a win-lose contest. | | .60 | 2.87 | 1.52 |
| Enjoy winning an argument. | | .41 | 4.23 | 1.55 |
| Overstate the needs and positions in order to get our ways. | | .55 | 3.61 | 1.65 |
| Are firm in pursuing one side of an issue. | | .42 | 4.19 | 1.29 |
| ** Item in original scale but not included as scale revised to improve Cronbach's alpha. | | | | |

## TABLE 27

### Scale Reliabilities: Constructive Conflict/Crossfunctional Success

| Measure Used | Cronbach's Alpha | Item to Total Correlation | Mean | Standard Deviation |
|---|---|---|---|---|
| **Constructive Conflict:** | | | | |
| Work harder because of the conflicts that we have.** | .80 | .34 | 3.82 | 1.63 |
| See constructive changes occur on projects because of conflicts. | | .62 | 4.80 | 1.41 |
| Know each other better because of the way conflicts are handled. | | .59 | 5.26 | 1.26 |
| Are more sensitive to one another because of the way that conflicts are handled. | | .58 | 4.84 | 1.39 |
| Feel energized and ready to get down to work after a conflict. | | .66 | 4.10 | 1.54 |
| Feel hostile toward each other after a conflict.* | | .44 | 4.61 | 1.58 |
| **Crossfunctional Success:** | | | | |
| We feel very satisfied in our work with each other. | .94 | .76 | 4.80 | 1.47 |
| We feel a strong commitment to working with each other on new product development. | | .81 | 5.41 | 1.42 |
| We have a high degree of trust in each other. | | .82 | 4.70 | 1.60 |
| The way we work together inspires all of us to better job performance. | | .79 | 4.51 | 1.44 |
| We feel highly committed to joint work with each other on new product development. | | .82 | 5.08 | 1.45 |
| All things considered, we feel highly pleased with the way in which we work together on new product development. | | .84 | 4.64 | 1.56 |
| The way we work together makes us think seriously about quitting new product projects. */** | | .66 | 5.47 | 1.62 |

* Item reverse scored
** Item in original scale, but not included as scale revised to improve Cronbach's alpha.

## TABLE 28

### Scale Reliabilities: New Product Success

| Measure Used | Cronbach's Alpha | Item to Total Correlation | Mean | Standard Deviation |
|---|---|---|---|---|
| Overall, our company is one of the most successful in the industry. | 0.85 | .65 | 4.83 | 1.84 |
| Our overall performance of our new product program has met our objectives. | | .72 | 4.06 | 1.74 |
| From an overall profitability standpoint, our new product development program has been successful. | | .67 | 4.39 | 1.71 |
| Compared to major competitors, our overall new product program is far more successful. | | .73 | 4.28 | 1.77 |
| Compared to our major competitors, our new product development cycle time has been relatively less. | | .51 | 4.02 | 1.77 |
| Our product-line breadths are much broader than those of our competitors. | | .37 | 4.27 | 1.95 |
| The overall quality of our new products is higher than that of our competitors. | | .42 | 5.06 | 1.53 |
| The overall price of our new products is higher than that of our competitors. */** | | .04 | 3.73 | 1.59 |
| The timing of our product introduction is good. | | .50 | 3.88 | 1.54 |
| Our company has relatively high market shares. | | .44 | 4.38 | 1.88 |
| Our new product development costs generally stay within our budgeted costs. | | .38 | 3.82 | 1.65 |

* Item reverse scored
** Item in original scale but not included as scale revised to improve Cronbach's alpha.

## TABLE 29

### Scale Reliabilities: Structural Conflict Handling

| Measure Used | Cronbach's Alpha | Item to Total Correlation | Mean | Standard Deviation |
|---|---|---|---|---|
| **Formalization** | | | | |
| Written procedures and guidelines are available for most work situations. | .77 | .55 | 3.93 | 1.99 |
| Formal communications channels have been established. | | .54 | 4.56 | 1.63 |
| Written documents, such as budgets, plans, and schedules, are an integral part of the job. | | .55 | 4.59 | 1.80 |
| Performance appraisals in our organization are based on written performance standards. | | .46 | 3.96 | 1.89 |
| Duties, authority, and accountability of personnel are documented in policies, procedures, or job descriptions. | | .59 | 3.86 | 1.81 |
| **Centralization** | | | | |
| Any decision I make has to have my boss' approval. | .90 | .69 | 3.02 | 1.79 |
| There is little action taken here until a supervisor approves a decision. | | .77 | 3.37 | 1.88 |
| Even small matters have to be referred to someone higher up for a final answer. | | .78 | 2.84 | 1.82 |
| A person who wants to make his own decision would be quickly discouraged here. | | .76 | 2.76 | 1.66 |
| I have to ask my boss before I do almost anything. | | .78 | 2.18 | 1.54 |

## TABLE 30

## Scale Reliabilities: Firm Strategy

| Measure Used | Cronbach's Alpha | Item to Total Correlation | Mean | Standard Deviation |
|---|---|---|---|---|
| In comparison to our competitors, the products we provide our customers are more innovative, and continually changing. | 0.88 | .61 | 4.70 | 1.54 |
| In contrast to our competitors, my organization has an image in the marketplace as a firm with a reputation for being innovative and creative. | | .58 | 4.78 | 1.59 |
| My firm spends significant amounts of time continuously monitoring the marketplace for changes and trends. | | .57 | 4.11 | 1.73 |
| In comparison to our competitors, the increases or losses in demand which we have experienced are due most probably to our practice of aggressively entering new markets with new types of products. | | .51 | 3.51 | 1.67 |
| One of this firm's key goals relative to its competitors is availability of the people, resources, and equipment required to develop new products and markets. | | .53 | 4.43 | 1.59 |
| In contrast to our competitors, our managerial employees exhibit competencies (skills) that are broad, entrepreneurial, diverse, and flexible--enabling change to be created. | | .61 | 4.41 | 1.65 |
| The one thing that protects my organization from its competitors is that we are able to consistently develop new products and new markets. | | .72 | 4.14 | 1.56 |
| Our management staff concentrates on developing new products, new markets and new market segments more than many of our competitors. | | .74 | 3.83 | 1.61 |
| In contrast to many competitors, my organization identifies marketplace trends and opportunities that can result in product offerings new to the industry or able to reach new markets. | | .61 | 4.23 | 1.57 |
| In comparison to our competitors, the structure of my organization is product or market oriented. | | .55 | 4.54 | 1.49 |
| Unlike our competitors, our company procedures to evaluate performance are decentralized and participatory, encouraging many company members to be involved. | | .38 | 3.97 | 1.59 |

## TABLE 31

### Correlation Matrix of Constructs

| | Integrating | Forcing | Avoiding | Formal. | Cent. | Construc. | Crosperf | NPPerf | Conflict | Strategy |
|---|---|---|---|---|---|---|---|---|---|---|
| **Integrating** | 1.0000<br>.0000 | | | | | | | | | |
| **Forcing** | -.6207<br>.0001 | 1.0000<br>.0000 | | | | | | | | |
| **Avoiding** | -.4825<br>.0001 | .4149<br>.0001 | 1.0000<br>.0000 | | | | | | | |
| **Formalization** | .2367<br>.0001 | -.1678<br>.0042 | -.1235<br>.0356 | 1.0000<br>.0000 | | | | | | |
| **Centralization** | -.3700<br>.0001 | .3564<br>.0001 | .3705<br>.0001 | -.2244<br>.0001 | 1.0000<br>.0000 | | | | | |
| **Constructive Conflict** | .5396<br>.0001 | -.3461<br>.0001 | -.2752<br>.0001 | .2307<br>.0001 | -.1961<br>.0008 | 1.0000<br>.0000 | | | | |
| **Crossfunctional Success** | .6759<br>.0001 | -.5035<br>.0001 | -.4057<br>.0001 | .2650<br>.0001 | -.3529<br>.0001 | .5252<br>.0001 | 1.0000<br>.0000 | | | |
| **New Product Success** | .3869<br>.0001 | -.2904<br>.0001 | -.1717<br>.0034 | .2658<br>.0001 | -.3142<br>.0001 | .2617<br>.0001 | .4214<br>.0001 | 1.0000<br>.0000 | | |
| **Conflict Level** | -.4649<br>.0001 | .4478<br>.0001 | .2475<br>.0001 | -.1452<br>.0133 | .2676<br>.0001 | -.3105<br>.0001 | -.5929<br>.0001 | -.3535<br>.0001 | 1.0000<br>.0000 | |
| **Strategy** | -.1458<br>.0133 | .0680<br>.2487 | .0880<br>.1351 | -.0605<br>.3045 | .1557<br>.0079 | -.1064<br>.0705 | -.0684<br>.2458 | .1127<br>.0552 | .0610<br>.3006 | 1.0000<br>.0000 |

* Top figure = Pearson product-moment coefficients; bottom figure = $p < .05$

## Validity Analysis

While reliability is necessary for interpretability of measures, it is not sufficient. For measures to be interpretable they must also have validity, i.e., nonrandom error has been minimized. Validity may take the form of content, criterion-related, construct, and convergence/discriminability validity. Content validation, assessing the sampling adequacy of the content of a measure, is provided for the measures in this study in part by the individual researchers who have developed, used, and relied upon the scales used. The review of literature supporting this study affirms the content validation through commonalities in measurement across researchers. Each construct used in this study represents the dimensions empirically established by previous research and reflects the universe of content (Kerlinger, 1986). (Criterion-related validity, comparing the measure with external variables measuring the same attribute, was not assessed for this study, because no criteria were readily identifiable for this purpose.)

Because most variables used in social science are abstractions, researchers create variables called constructs. Hence, the validity of constructs, as represented by imperfect measures, must be assessed. Several methods exist for checking the validity of these constructs in research, among them the multitrait-multimethod matrix method (Campbell & Fiske, 1959), item-to-total correlation, and factor analysis. The multitrait-multimethod method was not pursued in this study. Item-to-total correlations were used to assess validity, however. This method assumes validity of the total score. Consequently, the extent to which the individual item score correlates with the total score that item is valid. Those items within each scale with high item-to-total correlation were retained and demonstrated a limited form of validity. When

correlation was so low that it lowered the reliability of the scale, the item was eliminated because of its failure to strongly represent the construct of interest, i.e., the item was not valid.

One issue in construct validity is that both convergence and discriminability be met. Convergence means that data gathered in different ways will indicate consistency in the meaning of a construct. Discriminability is empirical differentiation between similar constructs. These concepts have been demonstrated for many of the constructs used in the study through previous empirical work. The correlation matrix of the constructs in the study provides another demonstration of convergence and discriminability that is internal. That is, where theory and extant literature would predict high correlation between constructs or low correlation between constructs, these relationships were found.

The most powerful method of construct validation is factor analysis (Kerlinger, 1986). Factor analysis is a broad collection of mathematical procedures, as well as a broad grouping of approaches used to conceptually cluster variables. It views variables as relating to underlying "factors" and performs "analyses" that discover these factors. This study used exploratory factor analysis to assess the construct validity of the scales used in the study survey. Nunnally (1978, p. 113) states that "With construct validity, factor analysis provides some of the tools that are most useful for determining internal structures and cross structures for sets of variables."

As stated before, factor analysis is an amalgam of mathematical and conceptual approaches. In current research the common factor model and principal component analysis are among the most widely used factor analyses (Kim & Mueller, 1978). These approaches, however, assume that the variables included in the analysis in some sense constitute a universe. Only two of the currently popular factor analysis methods do not approach initial factoring that way. Alpha factoring and image analysis assume that the variables included in the factor

analysis represent a sample taken from an infinite universe of variables related to the psychometric domain of interest. Alpha, however, also assumes that the variables are observations across a population. Both methods assume that the observed variables are linear combinations of hypothetical factors. Thus, given an exploratory model, the assumption of an infinite universe of linearly related variables, and *sampling* from a population, image factor analysis was deemed the most appropriate factor analysis method for construct validation.

The mathematics in image analysis define the *image* as that part of the variable that is predictable (common) as a linear combination of the remaining variables included in the set. The unique part of a variable, that part not predictable by linear combination of the remaining variables, is the anti-image. Image analysis generates for a sample of variables partial images that approximate a total image. The approximation, however, is completely specified by the observations. This differs from common factor analysis where the common variance is never a direct function of the observed variables. Having chosen image factor analysis, steps one and two of the factor analysis process, preparation of the covariance matrix and extracting the initial factors, were in place.

The third step in factor analysis is rotation to a final solution. Such rotation seeks to produce simpler and more interpretable factors at the same time retaining fixed numbers of factors and fixed communalities generated by the initial factoring. VARIMAX rotation is probably the most commonly used rotation method in the literature currently. It simplifies the columns of the factor matrix and, thus, maximizes the separation of the factors. Because the goal of factor analysis in this study was to validate the constructs, maximization of the separation of the factors was highly desired. For this reason, the image factor analysis procedures were run using VARIMAX (orthogonal) rotation.

The decision rule to retain factors generated by the Image analyssis was an eigenvalue of greater than 1 when the correlational matrix was decomposed (Kim & Mueller, 1978). This was visually supplemented by scree tests (Cattell, 1965), which recommend cessation of factoring where eigenvalues level off creating a straight, roughly horizontal line. Although factor loadings of .30 or above are sufficient according to Kim and Mueller (1978) for a variable's inclusion in a factor and Spector (1992) cites .30 to .35 as acceptable low end cut-off points, the researcher applied a more conservative and stringent rule for this study. Only factor loadings of .40 or above were considered for inclusion of a variable in a factor. Also, variables double loading were dropped from consideration. The following sections present the results of the Image factor analysis for each construct.

***Conflict Level.*** The conflict level scale (12 items), based on the literature and on logic, was expected to yield a single scale measuring general conflict levels within the organization (Jaworski & Kohli, 1993; Ruekert & Walker, 1987). Image produced a single large "conflict level" factor of 12 items (Factor 1 CONLEVEL Eigenvalue = 3.94; no other Eigenvalue greater than 1). Although the literature indicates that conflict is generated by goal differences, mean differences, and value differences, the items measuring these dimensions all loaded on a single factor, CONLEVEL, as predicted. Table 32 reports the factor loadings for the items measuring CONLEVEL.

***Behavioral Conflict Handling.*** Behavioral conflict handling was measured via five scales, integrating behavior (7 items), compromising behavior (6 items), accommodating behavior (5 items), avoiding behavior (9 items), and forcing behavior (9 items). These measures, developed by Blake and Mouton (1964), have been previously tested for validity by Rahim (1983), resulting in five factors. Analysis of the five scales by Image factor analysis resulted in

## TABLE 32

### Factor Analysis: Measures of Conflict Level

| Factor (% Variance Explained) | Measures Loading on Factor | Loadings |
|---|---|---|
| 1. Measures of conflict level: **CONLEVEL** (41.8%) | Employees from the two departments feel that the goals of their respective departments are in harmony with each other. | .81 |
| | There is little or no interdepartmental conflict. | .69 |
| | Employees from the two departments share the same values. | .68 |
| | People differ on the best way to accomplish new product goals. | .67 |
| | We get along well with each other. | .67 |
| | People differ on the basic goals the two areas should pursue. | .66 |
| | Employees agree on which tasks are urgent. | .64 |
| | People conflict over how they should carry out their work. | .64 |
| | People in the two areas rate the importance of decisions in the same way. | .63 |
| | People conflict on how to proceed on tasks. | .61 |
| | People in one department generally dislike interacting with those from the other department. | .56 |
| | The objectives pursued by the Marketing department are incompatible with those of the R&D department. | .42 |

an initial three factors with latent roots greater than 1. After rotation a fourth factor was retained, Factor 1 INTEGRATE, Eigenvalue = 7.14, Factor 2 AVOID Eigenvalue = 4.04, Factor 3 FORCE1 Eigenvalue = 3.17, Factor 4 FORCE2 Eigenvalue = 2.53. No other factor had an Eigenvalue greater than one. Table 33 presents the loadings for all four factors; however, based on the scree test, factor four would be eliminated.

Factor 1, INTEGRATE (integrating) represented a combination of integrating, compromising, and accommodating behavior items. As discussed in Chapter 2, Figure 8 (p. 33), integrating, compromising, and accommodating behaviors represent possible trade-offs between concern for productivity and concern for people. Essentially, these three factors have been described in the literature as differing levels of proactivity in integrating behavior. Thus, Factor 1 INTEGRATE accurately reflects the relationship that exists between integrating, accommodating, and compromising conflict behaviors. The avoiding behavior items loaded on Factor 2, AVOID (avoiding). The forcing behavior items loaded on both Factor 3, FORCE1 (forcing 1), and Factor 4 FORCE2 (forcing 2). The items loading on Factor 3 and Factor 4 appear to be identical in content. Although the analyses produced four factors rather than the five identified by Rahim (1983), the results make theoretical sense.

***Structural Conflict Handling.*** Two methods of structural conflict handling were measured, formalization and centralization, using 10 items (Hage & Aiken, 1967). The structural scale was expected to yield two factors representing the two methods of structural conflict handling. As predicted, all five items measuring centralization loaded on Factor 1 CENTRAL (Eigenvalue = 3.95) and all five items measuring formalization loaded on Factor 2 FORMAL (Eigenvalue = 2.26). Table 34 reports the factor loadings for CENTRAL and FORMAL.

## TABLE 33

### Factor Analysis: Measures of Conflict Handling Behavior

| Factor (% Variance Explained) | Measures Loading on Factor | Loadings |
|---|---|---|
| 1. Measures of integrating behavior: **INTEGRATE** (39.7 %) | Arrive at compromises that both areas can accept. | .82 |
| | Propose compromises in order to end deadlocks. | .74 |
| | Negotiate to achieve goals. | .70 |
| | Try to investigate an issue in order to find a solution agreeable to us both. | .67 |
| | Try to bring all issues into the open in order to resolve them in the best way. | .65 |
| | Work hard to thoroughly, jointly learn about issues. | .64 |
| | Openly share concerns and issues. | .64 |
| | Look for middle ground to resolve disagreements. | .63 |
| | Exchange complete and accurate information in order to help solve problems. | .62 |
| | Encourage others to express their feelings and views | .58 |
| | Go the extra mile to get along with others. | .57 |
| | Try to meet others' schedules whenever we can. | .52 |
| | Stress the importance of "give and take." | .50 |
| | Try to satisfy the expectations of others. | .44 |
| 2. Measures of avoiding: **AVOID** (36.3 %) | Try to stay away from disagreements. | .71 |
| | Try not to get mixed up in conflicts. | .70 |
| | Believe it is better to keep feelings to ourselves. | .68 |
| | Look for ways to bypass unpleasantness. | .68 |
| | Avoid being on spot by keeping conflict to ourselves. | .62 |
| | Avoid openly discussing disputed issues. | .54 |
| | Smooth over conflicts by trying to ignore them. | .49 |
| | Try to keep anger and frustration from being expressed. | .48 |
| | Try to keep differences of opinion quiet. | .47 |
| 3. Measures of forcing: **FORCE1** (31 %) | Look for faults in each other's initial positions. | .70 |
| | Overstate needs in order to get our ways. | .65 |
| | Enjoy winning an argument. | .51 |
| | Are firm in pursuing one side of an issue. | .45 |
| | Do all we can do to achieve harmony. | .43 |
| 4. Measures of forcing: **FORCE2** (37.8 %) | Stick to initial positions to get each other to compromise. | .68 |
| | Want the other to make concessions, but don't want to make concessions ourselves. | .67 |
| | Tenaciously argue the merit of initial positions. | .65 |
| | Treat issues in conflict as a win/lose contest. | .43 |

## TABLE 34

### Factor Analysis: Measures of Structural Conflict Handling

| Factor (% Variance Explained) | Measures Loading on Factor | Loadings |
|---|---|---|
| 1. Measures of centralization: **CENTRAL** (63.6 %) | Even small matters have to be referred to someone higher up for a final answer. | .85 |
| | A person who wants to make his own decision would be quickly discouraged here. | .83 |
| | Any decision I make has to have my boss' approval. | .83 |
| | There is little action taken here until a supervisor approves a decision. | .82 |
| | I have to ask my boss before I do almost anything. | .75 |
| 2. Measures of formalization: **FORMAL** (36.4 %) | Duties, authority, and accountability of personnel are documented in policies, procedures, or job descriptions. | .71 |
| | Written procedures and guidelines are available for most work situations. | .66 |
| | Formal communications channels have been established. | .63 |
| | Performance appraisals in our organization are based on written performance standards. | .58 |
| | Written documents, such as budgets, plans, and schedules, are an integral part of the job. | .58 |

***Constructive Conflict.*** Constructive conflict (6 items) was expected to be a single scale with two dimensions, one dealing with feelings and the other with work improvements (Barker, Tjosvold, & Andrews, 1988). Image analysis yielded one large factor CONSTRUCT, with an Eigenvalue of one or more (Factor 1 CONSTRUCT Eigenvalue = 4.64). No other factor had an Eigenvalue greater than one. Thus, the factor analysis supported the constructive conflict measures as a single scale. Table 35 presents the factor loadings for CONSTRUCT.

***Crossfunctional Success.*** New product success was measured in two ways. The first scale (7 items) measured crossfunctional relationship success between R&D and marketing (Barker, Tjosvold, & Andrews, 1988). The seven items were expected to be identified as a single scale. Image factor analysis resulted in a single factor, CROSPERF, with an Eigenvalue = 4.43, supporting the predicted single scale. No other factor had an Eigenvalue of greater than one. Table 35 presents the factor loadings for CROSPERF.

***New Product Success.*** The second measure of new product success measured new product success in the marketplace (Song, 1991, 1993). This scale was expected to be a single scale with multiple dimensions, dealing with goals, cycle time, quality, costs, price, and other dimensions critical to understanding new product success against competitors in the marketplace. Analysis by Image resulted in a single factor, NPPERF, with an Eigenvalue = 3.39, supporting the expected single scale. Table 36 presents the factor loadings for NPPERF.

***Strategic Position.*** Firm strategic position is measured using an 11-item scale based on the Miles and Snow (1978) typology (Conant, Mokwa, & Varadarajan, 1990). This scale was adapted from the Conant, Mokwa, and Varadarajan typing scale by using the eleven Prospector responses to each of the original scale questions. Respondents scoring high on the scale would be Prospectors or Prospector-like companies, and those scoring low on the scale would be

## TABLE 35

### Factor Analysis: Measures of Constructive Conflict/Crossfunctional Success

| Factor (% Variance Explained) | Measures Loading on Factor | Loadings |
|---|---|---|
| 1. Measures of constructive conflict: **CONSTRUCT** (82.9 %) | Feel energized and ready to get down to work after a conflict. | .82 |
| | See constructive changes occur on projects because of conflicts. | .77 |
| | Know each other better because of the way conflicts are handled. | .74 |
| | Are more sensitive to one another because of the way that conflicts are handled. | .74 |
| | Feel hostile toward each other after a conflict. | .61 |
| | Work harder because of the conflicts that we have. | .458 |
| 2. Measures of crossfunctional success: **CROSPERF** (95.5 %) | All things considered, we feel highly pleased with the way in which we work together on new product development. | .89 |
| | We feel highly committed to joint work with each other on new product development. | .89 |
| | We have a high degree of trust in each other. | .88 |
| | We feel a strong commitment to working with each other on new product development. | .88 |
| | The way we work together inspires all of us to better job performance. | .86 |
| | We feel very satisfied in our work with each other. | .81 |
| | The way we work together makes us think seriously about quitting new product projects. | .72 |

## TABLE 36

### Factor Analysis: Measures of New Product Success

| Factor (% Variance Explained | Measures Loading on Factor | Loadings |
|---|---|---|
| 1. Measures of new product success: **NPPERF** (79.1 %) | Compared to major competitors, our overall new product program is far more successful. | .85 |
| | Our overall performance of our new product program has met our objectives. | .85 |
| | Overall, our company is one of the most successful in the industry. | .79 |
| | From an overall profitability standpoint, our new product development program has been successful. | .78 |
| | Compared to our major competitors, our new product development cycle time has been relatively less. | .58 |
| | The timing of our product introduction is good. | .57 |
| | Our company has relatively high market shares. | .55 |
| | The overall quality of our new products is higher than that of our competitors. | .51 |
| | Our product-line breadths are much broader than those of our competitors. | .47 |
| | Our new product development costs generally stay within our budgeted costs. | .42 |

Defenders, or Defender-like companies. Logic dictates that the items should analyze as a single scale. Image analysis resulted in a single factor, STRATEGY, with an Eigenvalue = 3.96. No other factors had an Eigenvalue greater than one. Table 37 reports the factor loadings for STRATEGY.

***Scale Changes.*** Based on the data, the integrating, accommodating, and compromising scales developed by Rahim (1983) were not validated. Respondents in the study sample do not differentiate among the three levels of integrative conflict behaviors. As a result, Image factor analysis collapsed the three scales into a single factor. Reflecting this finding, a new 13-item scale measuring integrative conflict handling behavior (based on all of the previous scales items) was developed. First, coefficient alphas were run on all original 18 items from the three scales. The item to total correlations indicated that five items should be dropped to improve Cronbach's alpha. The remaining 13 items formed a single scale with a Cronbach's alpha of .91 that is used to test the study hypotheses concerning integrative conflict handling behavior. Minor rewording of the hypotheses has been done to reflect the new scale. All hypotheses that predicted integrative conflict handling behavior relationships reflect use of the new scale:

$H_2$: In conflict situations between R&D and marketing, Prospectors will use integrating conflict handling behavior more than Defenders.

$H_8$: In conflict situations between R&D and marketing, a positive association will be found between integrating conflict handling behavior and constructive conflict.

## Model Testing

This study will explore a portion of the general model of conflict presented in earlier chapters. Specifically the study looks at the relationships that exist between conflict handling methods and the perceived outcomes of conflict episodes within organizations. It is based on the assumption that conflict has the potential to generate positive results. Thus, this section will

## TABLE 37

### Factor Analysis: Measures of Firm Strategy

| Factor (% Variance Explained) | Measures Loading on Factor | Loadings |
|---|---|---|
| 1. Measures of firm strategy: **STRATEGY** (87.6 %) | Our management staff concentrates on developing new products, new markets and new market segments more than many of our competitors. | .84 |
| | The one thing that protects my organization from its competitors is that we are able to consistently develop new products and new markets. | .82 |
| | In comparison to our competitors, the products we provide our customers are more innovative, and continually changing. | .71 |
| | In contrast to many competitors, my organization identifies marketplace trends and opportunities that can result in product offerings new to the industry or able to reach new markets. | .69 |
| | In contrast to our competitors, our managerial employees exhibit competencies (skills) that are broad, entrepreneurial, diverse, and flexible--enabling change to be created. | .68 |
| | In contrast to our competitors, my organization has an image in the marketplace as a firm that has a reputation for being innovative and creative. | .68 |
| | My firm spends significant amounts of time continuously monitoring the marketplace for changes and trends. | .64 |
| | In comparison to our competitors, the structure of my organization is product or market oriented. | .63 |
| | One of this firm's key goals relative to its competitors is availability of the people, resources, and equipment required to develop new products and markets. | .60 |
| | In comparison to our competitors, the increases or losses in demand which we have experienced are due most probably to our practice of aggressively entering new markets with new types of products. | .58 |
| | Unlike our competitors, our company procedures to evaluate performance are decentralized and participatory, encouraging many company members to be involved. | .43 |

present a portion of the conflict model that links conflict level, conflict handling behaviors, and structural conflict handling methods to constructive conflict. A second stage of the model links constructive conflict with new product success. Both stages of the model were formulated as linear relationships and estimated by linear multiple regression.

The structural model for the first stage represents constructive conflict as a function of conflict, conflict handling behaviors, and structural conflict handling methods as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \epsilon$$

where $Y$ = constructive conflict

$X_1$ = conflict level; $X_2$ = integrating conflict handling behavior; $X_3$ = avoiding conflict handling behavior; $X_4$ = forcing conflict handling behavior; $X_5$ = structural conflict handling (formalization); $X_6$ = structural conflict handling (centralization).

This model was estimated with multiple regression using ordinary least squares. The signs of the parameter estimates were as expected on conflict level (-), integrating (+), avoiding (-), and formalization (+). Two of the parameter estimates, integrating conflict handling behavior and formalization, were statistically significant. The significance of integrating conflict handling behavior supports Hypothesis 8 that there is a positive relationship between this variable and constructive conflict. Integrative conflict handling behavior was by far the most important explanatory construct in the model. Integrating conflict behavior and formalization represent the strongest factors within their particular conflict handling method based on the literature as well. The results of the regression analysis are presented in Table 38.

A SAS procedure was run generating all possible two-way interactions prior to formulating the final model. Only one significant interaction was found, conflict level with integrating behavior. With the interaction term included in the model no improvement in explanatory value was noted. The partial F test based upon the ratio of the mean square of regression with the interaction term excluded and the mean square regression with the interaction term included was close to unity and therefore not significant. Thus, the interaction term was omitted from the final model.

**TABLE 38**

**Regression Results: Constructive Conflict Model**

| Parameter | Parameter Est. | S.D. | T for $H_0$ | Pr > \|T\| |
|---|---|---|---|---|
| Intercept | 1.8989 | 0.6939 | 2.74 | 0.0066 |
| Conflict Level | -0.0787 | 0.0602 | -1.31 | 0.1926 |
| Integrating Behavior | 0.5474 | 0.0795 | 6.89 | 0.0001 |
| Avoiding Behavior | -0.0256 | 0.0601 | -0.43 | 0.6706 |
| Forcing Behavior | 0.0028 | 0.0727 | 0.04 | 0.9692 |
| Centralization | 0.0256 | 0.0408 | 0.63 | 0.5307 |
| Formalization | 0.0906 | 0.0421 | 2.16 | 0.0318 |

$R^2 = 0.31$; d.f. = 289; F Value for Regression Model = 20.95 Pr > F = 0.0001

The structural model for the second stage of the model expresses performance as a function of constructive conflict. Performance was measured using two constructs, crossfunctional success and new product success as follows:

$$Y = \beta_0 + \beta_1 X_1 + \epsilon$$

where $Y$ = crossfunctional success

$X_1$ = estimated constructive conflict

or $Y$ = new product success

The model was estimated by ordinary least squares in a simple regression model. This was done separately for each of the two dependent variables. Both models were significant at the 0.0001 level. Both signs were positive as hypothesized. Both were significantly different from zero at the 0.0001 level. For the model with crossfunctional success as the dependent variable $R^2 = .51$. For the model with new product success as the dependent variable $R^2 = .18$. The results of these regressions support Hypothesis 10 that there will be a positive association between constructive conflict and both crossfunctional success and new product success. The regression results for both models are shown in Table 39.

**TABLE 39**

**Regression Results: Performance Models**

| Model | Parameter | Parameter Estimate | S.D. | T for $H_0$ | Pr > \|T\| |
|---|---|---|---|---|---|
| Crossfunctional Success | Intercept | - 2.6868 | 0.4434 | - 6.06 | 0.0001 |
| | Constructive Conflict | 1.5972 | 0.0932 | 17.14 | 0.0001 |
| ($R^2 = .51$, d.f. = 289) | | | | | |
| New Product Success | Intercept | 0.4163 | 0.4964 | 0.84 | 0.4023 |
| | Constructive Conflict | 0.8222 | 0.1043 | 7.88 | 0.0001 |
| ($R^2 = .18$, d.f. = 289) | | | | | |

The results of the model testing suggest several important points. Relative to the relationship between the two conflict handling methods, conflict handling behaviors have a much greater impact on constructive conflict than structural modes of handling conflict. Also, within the conflict handling behaviors, integrative conflict behaviors have the largest positive impact. Between the two structural methods of handling conflict, the model testing indicates that

formalization is substantially more important in gaining constructive conflict outcomes. This is meaningful to both strategic types.

For Prospector companies, companies with well-developed face-to-face internal interactions (sufficient quantity), quality of conflict handling behavior will be critical for successful conflict management. That is, conflict behaviors during conflict interactions should seek to be as integrative as possible. Such behaviors will lead to constructive outcomes for companies. For Defender companies, companies with relatively few face-to-face internal interactions, both quality and quantity of conflict handling behavior will be critical for successful conflict management. That is, when conflicts arise interactions will need to be of sufficient quantity to allow for the use of integrative conflict handling behaviors and, additionally, each interaction will need to focus on integrative conflict behaviors.

For both strategic types emphasis should be put on formalization of procedures and interactions in order to increase constructive conflict outcomes. This emphasis should be both on quality and quantity. This may surprise Prospector companies that thought good communications only required good verbal skills. These companies may need to work on the quantity issue. This may also surprise Defender companies that thought quantity of formalization was sufficient. These companies may need to work on the quality issue.

As discussed earlier, part of the motivation behind the study is to develop an instrument to assess constructive conflict within organizations. Thus, this study is exploratory in that it seeks only to understand the impact of conflict behaviors and structural conflict handling methods on constructive conflict. The results clearly show that integrative conflict behavior is the key factor in gaining constructive conflict outcomes. An $R^2 = .31$ shows the independent variables in this study do have a substantial influence on constructive conflict. Conversely, it

also indicates that other factors substantially affect constructive conflict. These factors must be researched in order to develop an instrument that will be able to meaningfully assess constructive conflict in organizations.

A remaining question would be whether constructive conflict is really an important factor at all in new product development, one that justifies further research to develop an instrument to measure it. The results of the second stage model do that. These results justify constructive conflict as a very important factor in both crossfunctional success ($R^2 = .51$) and in new product success ($R^2 = .18$). The impact of constructive conflict as a single factor on crossfunctional success is quite substantial. The impact of constructive conflict on new product success is surprisingly high given the many things that contribute to that outcome.

## Classification of Strategic Type

The Conant, Mokwa, and Varadarajan (1990) scale was adapted to assess strategic position for this study. The original scale poses eleven questions on strategic position to which there are four answers for each question. One response reflects the actions of a Prospector, one a Defender, one an Analyzer, and one a Reactor. The eleven Prospector responses to the questions, or Prospector actions, were used to create a new scale. Respondents were presented with these eleven aggressive new product development actions and asked to designate on a scale of 1 to 7 (1 being "strongly disagree" and 7 being "strongly agree") to what extent they agreed that their firm pursued such actions. It was expected that Prospectors would evidence a pattern of responses on the high end of the scale and that Defenders would evidence a pattern of responses on the low end of the scale. Analyzers and Reactors were expected to shift back and forth from high to low and low to high.

In order to test the hypotheses dealing with firm strategy (H1-H7), i.e., to assign responses to strategic groups, the responses to the adapted Conant, Mokwa, and Varadarajan (1990) instrument were analyzed using cluster analysis, an approach to classification based on the idea that "pattern represents process" (Sokal & Sneath,1963). Cluster analysis is a generic name for a group of multivariate statistical procedures used to create classifications. These procedures start with a data set (a sample of entities) and reorganize the entities into groups that are relatively homogeneous. There are seven major families of clustering methods used across the sciences: hierarchical agglomerative, hierarchical divisive, iterative partitioning, density search, factor analytic, clumping, and graph theoretic (Aldenderfer & Blashfield,1984). The method chosen needs to be compatible with the kind of classification, the variables involved, and the measure used to determine similarity between cases. As a result, only three of the above methods are routinely used within the social sciences. These are hierarchical agglomerative, iterative partitioning, and factor analytic (Aldenderfer & Blashfield,1984).

Classification of responses into Prospector and Defender for this study was done using SAS's FASTCLUS procedure, an iterative partitioning method. This method was selected because it avoids several of the problems associated with hierarchical agglomerative methods. First, FASTCLUS, unlike hierarchical methods, is intended for large data sets of 100 to 100,000 observations. Poor initial partitioning can be compensated for in FASTCLUS, because it makes more than one pass through the data (hierarchical agglomerative methods cannot correct for initial partitioning errors). Also, FASTCLUS produces single rank clusters that are not nested. Finally, because FASTCLUS is sensitive to outliers, it effectively identifies them by forcing them into clusters of one.

FASTCLUS begins by defining cluster "seeds" and then through repeated passes assigns observations to the nearest cluster centroid, finally ending with assignment of all observations into the number of clusters designated by the researcher. For this study, the maximum number of clusters was first constrained to four clusters, anticipating the four strategic types described by Miles and Snow (1978) and verified in numerous previous research efforts. The results were surprising. Although four clusters were produced, one cluster with dominantly positive responses on the scale (Prospectors), one cluster with dominantly negative responses on the scale (Defenders), and two clusters with mixed responses (Analyzers and Reactors), the two mixed clusters were not closest to one another as would be expected. Theoretic expectations would predict that the two mixed clusters should have centroids closest to each other because their pattern of strategic actions would be similar, even though the drivers behind the actions differ. Instead, one mixed group was more similar to the dominantly positive cluster and one mixed group was more similar to the dominantly negative cluster.

The results of the initial clustering procedure suggest that classification could just as well be done with a mean or median split. However, use of these other procedures would make the classification unduely sensitive to extreme values. Instead, cluster analysis makes the assignment based on overall pattern. Therefore, FASTCLUS was run once more constraining the procedure this time to a two-cluster result, Prospector or Defender. The procedure classified 162 respondents as members of Prospector-like companies and 128 respondents as members of Defender-like companies (Pseudo F Statistic = 109.8; Cubic Clustering Criterion = 55.18). As an additional check, ANOVA was then run on all 11 strategy measures to confirm that there was a significant difference between the two groups on these variables. It was unnecessary to standardize the data matrix because items used were measured on the same scale (Romesburg,

1984). The classifications identified using the second FASTCLUS procedure were then used to test Hypotheses H1 through H7.

## Tests of the Hypotheses

This section presents the statistical tests of the research hypotheses (Table 40 presents an overview of the hypotheses, scales, and analysis techniques). The hypothesis tests are presented in the same order as they were discussed at the end of Chapter 5. The analyses are run on both the total combined responses of 290, and the individual group responses of R&D (113 responses) and marketing (176 responses). As noted earlier, one respondent failed to indicate functional area membership. Each of the strategy hypotheses is followed by a summary table presenting N, means, standard deviations, the F-value, and significance. All hypotheses are accepted or rejected at $\alpha = .05$. In reporting the results the combined group response (290) is reported first and the individual group responses second.

### *Statistical Test of Hypothesis 1.*

H1: In conflict situations between R&D and marketing, Defenders will have a higher perceived level of conflict than Prospectors.

H1 was supported by the total combined, R&D, and marketing responses. For the total combined responses Defenders were found to be significantly different from Prospectors on the construct conflict level, $F = 25.21$, $p < .0001$. Defenders had the higher mean, 4.2058, versus 3.6223 for the Prospector personnel . H1 was also supported by both the R&D and marketing groups, $F = 7.61$, $p < .0068$, and $F = 15.65$, $p < .0001$. In each case Defenders had the highest means, indicating that Defender firms perceived higher conflict levels in their organizations than Prospector firms. The null hypothesis of no difference is rejected. Table 41 presents a summary of the ANOVA results.

## TABLE 40

### Hypotheses, Measurement Scales, Analysis Technique

| Hypotheses | | Instrument | Analysis |
|---|---|---|---|
| H1: | Ds will perceive higher conflict levels than Ps. | Jaworski & Kohli (1993)<br>Ruekert & Walker (1987) | ANOVA |
| H2: | Ps will use integrating behaviors more than Ds. | Rahim (1983) | ANOVA |
| H3: | Ds will use forcing and avoiding behaviors more than Ps. | Rahim (1983) | MANOVA |
| H4: | Ps will rely on formalization more than Ds. | Hage & Aiken (1967) | ANOVA |
| H5: | Ps will rely on centralization more than Ds. | Hage & Aiken (1967) | ANOVA |
| H6: | Ps will use behavior more than structure to handle conflict. | Hage & Aiken (1967)<br>Rahim (1983) | MANOVA<br>Repeated Measures |
| H7: | Ds will use structure more than behavior to handle conflict. | Hage & Aiken (1967)<br>Rahim (1983) | MANOVA<br>Repeated Measures |
| H8: | Positive association between integrating behavior and constructive conflict. | Rahim (1983)<br>Barker, Tjosvold, and Andrews (1988) | Correlation |
| H9: | Negative association between forcing and avoiding and constructive conflict. | Rahim (1983) | Correlation |
| H10: | Positive association between constructive conflict and new product development success. | Barker, Tjosvold, and Andrews (1988)<br>Song (1991; 1993) | Correlation |
| H11: | Constructive conflict to be associated with moderate levels of conflict. | Barker, Tjosvold, and Andrews (1988) | T-test<br>Quadratic Regression |

## TABLE 41

### Summary Data for Hypothesis 1

| Hypothesis | Group | Strategy | N | Mean | Standard Deviation | F | p > F |
|---|---|---|---|---|---|---|---|
| H1: Defenders will have a higher perceived level of conflict than Prospectors. | Combined | Defender | 128 | 4.2058 | 1.0121 | 25.21 | 0.0001 |
| | | Prospector | 162 | 3.6223 | 0.9589 | | |
| | R&D | Defender | 44 | 4.0752 | 1.1171 | 7.61 | 0.0068 |
| | | Prospector | 69 | 3.4826 | 1.1108 | | |
| | Marketing | Defender | 83 | 4.2424 | 0.9121 | 15.65 | 0.0001 |
| | | Prospector | 93 | 3.7259 | 0.8196 | | |

This finding contradicts that of Ruekert and Walker (1987), the only other major study to have pursued these questions. In their study, Prospectors were predicted to perceived a higher level of conflict than Defenders, based on the logic that key predictors in conflict level would be complexity and uncertainty in the firm environment. Their data supported the prediction. Significantly, however, the data came from three divisions of a single Fortune 500 company manufacturing industrial products. Because firms tend to have a conflict environment that pervades a given unit and because Ruekert and Walker's findings were based only on a marketing sample, the results are subject to challenge. The authors do describe their study as exploratory.

An important difference exists between this study and the former. This study takes the position that conflict levels have much more to do with the *behaviors* that are carried out during conflict episodes than with complexity and uncertainty of the firm environment. Indeed, these data show that the behaviors commonly associated with simplicity and certainty (forcing, avoiding, and centralization) within firms are positively associated with increased conflict levels (See Table 31). Forcing, a common practice in more traditional, hierarchical firms is strongly associated with increased conflict. It follows that the behaviors commonly associated with

Prospectors (e.g., good communication skills and a tendency out of need to more integrative behaviors) result in lower conflict levels. Thus, it was predicted that Defenders would perceive higher levels of conflict than Prospectors. The data's support of this prediction provides a better basis for generalization than the Ruekert and Walker sample, because these data come from respondents at 188 companies. Also, the companies that participated in this study are far more diverse.

The only difference noted between the R&D and marketing responses was the strength of the finding. There was less variation in the responses in the marketing group than in the R&D group, however. The tight distribution of response within marketing might be seen as unusual because marketers are often thought more diverse a group than R&D/engineering. Relative to the question of conflict levels, however, their responses are very similar.

***Statistical Test of Hypothesis 2.***

$H_2$: In conflict situations between R&D and marketing, Prospectors will use integrating conflict behavior more than Defenders.

H2 was supported by the total combined, R&D and marketing responses. Based on the total combined responses, Prospectors were found to be significantly different from Defenders on the construct integrating behavior, $F = 32.62$, $p < .0001$. Prospectors had the higher mean, 5.2899, versus 4.6877 for the Defender personnel. H1 was also supported by both the R&D and marketing groups, $F = 5.38$, $p < .0222$, and $F = 32.91$, $p < .0001$. In each case Prospector firms had the highest means, indicating that Prospectors perceive greater use of integrating conflict behaviors within the R&D/marketing interface than do Defender firms. The null hypothesis of no difference existing between the two strategic types on integrating behavior is rejected. Table 42 presents a summary of the ANOVA results.

**TABLE 42**
**Summary Data for Hypothesis 2**

| Hypothesis | Group | Strategy | N | Mean | Standard Deviation | F | p > F |
|---|---|---|---|---|---|---|---|
| H2: Prospectors use integrating behaviors more than Defenders. | Combined | Defender | 128 | 4.6877 | 0.9764 | 32.62 | 0.0001 |
| | | Prospector | 162 | 5.2899 | 0.8191 | | |
| | R&D | Defender | 44 | 4.7429 | 1.0726 | 5.38 | 0.0222 |
| | | Prospector | 69 | 5.1895 | 0.9482 | | |
| | Marketing | Defender | 83 | 4.6546 | 0.9323 | 32.91 | 0.0001 |
| | | Prospector | 93 | 5.3647 | 0.7046 | | |

These findings do support the previous literature in organizational behavior. It is difficult to compare the findings, however, to those of the Ruekert and Walker (1987) study. Their Proposition 4 combined avoidance and integrative behaviors as conflict *resolution* mechanisms. The findings of Thomas and Kilmann (1975) point out that avoiding is fifth in desirability of five possible conflict behaviors. In fact, many organization members would not see avoiding as a "resolution" of conflict at all. The results on Ruekert and Walker's Proposition 4 were mixed. The authors did find that relative to integrative behaviors the means were in the appropriate direction, but the difference between the two strategic groups was not found to be significant.

This study's findings on integrative behaviors supports the idea that Prospector firms actually have an advantage in establishing constructive conflict climates. Due to the inherent structure of such firms, integrative behavior is forced on them in order to cope with the number and complexity of their tasks. It would seem that the everyday integrative behaviors required of these firms spill over into the conflict handling behaviors as predicted. The findings also suggest that the inherent structure of Defenders de-emphasizes integrative skills because of their reliance

on hierarchy to handle conflicts that arise. Thus, in conflict situations, Defender personnel are perceived as less likely to use integrative behaviors to handle the situation. This suggests that relative to integrative conflict behavior Prospectors probably achieve the needed quantity of integrative behavior, but may still face a quality issue. Defenders likely face both a quantity and quality issue in integrative conflict behavior.

***Statistical Test of Hypothesis 3.***

$H_3$: In conflict situations between R&D and marketing, Defenders will use forcing and avoiding conflict behaviors more than Prospectors.

Hypothesis 3 was supported by the total combined, R&D, and marketing responses. Based on the total combined responses, Defenders were found to be significantly different from Prospectors on the constructs of forcing conflict behavior and avoiding conflict behavior, overall MANOVA $F = 11.23$, $p < .0001$. H3 was also supported by the MANOVA results based on both the R&D respondents and the marketing respondents with $F = 4.38$, $p < .0148$, and $F = 7.34$, $p < .0009$.

Hypothesis 3 (forcing behavior) was supported by the ANOVA analysis of the total combined responses, as well as by the ANOVA analyses of the individual group responses. The ANOVA of the forcing construct for the total combined responses was significant, $F = 18.02$, $p < .0001$. The means of the Defender responses were higher than those of the Prospector responses as predicted, 3.9341 and 3.4591 respectively. For the R&D respondents Defenders were different from Prospectors at $F = 6.68$, $p < .0111$, with the Defenders mean at 4.0177 and the Prospector mean at 3.5029. For the marketing respondents Defenders were different from Prospectors at $F = 11.97$, $p < .0007$, with the Defender mean at 3.8929 and the Prospector mean at 3.4265. Defenders are clearly perceived as using forcing behaviors more than Prospectors.

Hypothesis 3 (avoiding behavior) was also supported by the ANOVA analysis of the total combined responses, as well as by the ANOVA analyses of the individual group responses. The ANOVA of the avoiding construct for the total combined responses was significant, $F = 12.9$, $p < .0001$. The means of the Defender responses were higher than those of the Prospector responses as predicted, 3.4607 and 3.0258 respectively. For the R&D respondents Defenders were different from Prospectors at $F = 6.48$, $p < .0123$, with the Defenders mean at 3.5765 and the Prospector mean at 3.0725. For the marketing respondents Defenders were different from Prospectors at $F = 7.00$, $p < .0089$, with the Defender mean at 3.4018 and the Prospector mean at 2.9911. Thus, Defenders are clearly perceived as using avoiding behaviors more than Prospectors. Therefore, based on both the MANOVA and ANOVA analyses, the null hypothesis of no difference between the two strategic groups on forcing and avoiding is rejected. The results for the MANOVA and ANOVA analyses for the constructs forcing and avoiding are summarized in Tables 43 and 44.

Forcing and avoiding behaviors are associated with authority decisions and bureaucratic passing of the buck. This finding substantiates that the assumed emphasis on authority and bureaucracy thought to exist in Defender firms also exists in Defender new product development processes--a creative area needing flexibility. Secondly, as mentioned before, forcing and avoiding, demonstrate a positive association with conflict and a negative association with crossfunctional performance (See Table 31). Practically, the use of these two conflict handling behaviors can simply crowd out time for the use of integrative approaches. Forcing and avoiding rank last among the five recognized conflict handling behaviors in social desirability, meaning that people in organizations would least like to have conflict situations handled with these behaviors (Thomas & Kilmann, 1975). Thus, this finding suggests that Defenders will tend to

## TABLE 43

### Summary Data for Hypothesis 3: Forcing Behavior (ANOVA)

| Hypothesis | Group | Strategy | N | Mean | Standard Deviation | F | p > F |
|---|---|---|---|---|---|---|---|
| H3: Defenders use forcing and avoiding behaviors more than Prospectors. | Combined | Defender | 128 | 3.9341 | 1.0291 | 18.02[a] | 0.0001 |
| | | Prospector | 162 | 3.4591 | 0.8749 | | |
| | R&D | Defender | 44 | 4.0177 | 1.1196 | 6.68[b] | 0.0111 |
| | | Prospector | 69 | 3.5029 | 0.9732 | | |
| | Marketing | Defender | 83 | 3.8929 | 0.9884 | 11.97[c] | 0.0007 |
| | | Prospector | 93 | 3.4265 | 0.7983 | | |

[a] Multivariate test (Wilks' Lambda): $F = 11.23$, $p < 0.0001$
[b] Multivariate test (Wilks' Lambda): $F = 4.38$, $p < 0.0148$
[c] Multivariate test (Wilks' Lambda): $F = 7.34$, $p < 0.0009$

## TABLE 44

### Summary Data for Hypothesis 3: Avoiding Behavior (ANOVA)

| Hypothesis | Group | Strategy | N | Mean | Standard Deviation | F | p > F |
|---|---|---|---|---|---|---|---|
| H3: Defenders use forcing and avoiding behaviors more than Prospectors. | Combined | Defender | 128 | 3.4607 | 1.1029 | 12.9 | 0.0001 |
| | | Prospector | 162 | 3.0258 | 0.9568 | | |
| | R&D | Defender | 44 | 3.5765 | 1.2245 | 6.48 | 0.0123 |
| | | Prospector | 69 | 3.0725 | 0.8785 | | |
| | Marketing | Defender | 83 | 3.4018 | 1.0425 | 7.00 | 0.0089 |
| | | Prospector | 93 | 2.9911 | 1.0143 | | |

[a] Multivariate test (Wilks' Lambda): $F = 11.23$, $p < 0.0001$
[b] Multivariate test (Wilks' Lambda): $F = 4.38$, $p < 0.0148$
[c] Multivariate test (Wilks' Lambda): $F = 7.34$, $p < 0.0009$

have higher levels of conflict and will tend to use conflict handling behaviors that exacerbate the problem.

***Statistical Test of Hypothesis 4.***

$H_4$ In conflict situations between R&D and marketing, Prospectors will rely on formalization more than Defenders.

H4 was supported by the total combined responses and the R&D responses. Based on the total combined responses, Prospectors were found to be significantly different from Defenders on the construct formalization with $F = 11.83$, $p < .0007$. Prospectors had the higher mean, 4.4098, versus 3.8858 for the Defender personnel. H4 was also supported by R&D at $F = 9.33$, $p < .0028$, with the Prospector mean at 4.6174 and the Defender mean at 3.8318. H4 just missed significance with the marketing responses, $F = 3.30$, $p < .0708$. The Prospector mean was 4.2558, and the Defender mean was 3.9107. The null hypothesis of no difference existing between the two strategic types on formalization is rejected based on the total combined response and the R&D sample. Due to the marketing group results, however, it is necessary to say that H4 was partially supported. In each case, nonetheless, the means were in the predicted direction. Table 45 summarizes the ANOVA results for H6.

**TABLE 45**

**Summary Data for Hypothesis 4**

| Hypothesis | Group | Strategy | N | Mean | Standard Deviation | F | p > F |
|---|---|---|---|---|---|---|---|
| H4: Prospectors will rely on formalization more than Defenders. | Combined | Defender | 128 | 3.8858 | 1.2969 | 11.83 | 0.0007 |
| | | Prospector | 162 | 4.4098 | 1.2808 | | |
| | R&D | Defender | 44 | 3.8318 | 1.4344 | 9.33 | 0.0028 |
| | | Prospector | 69 | 4.6174 | 1.2643 | | |
| | Marketing | Defender | 83 | 3.9107 | 1.2339 | 3.30 | 0.0708 |
| | | Prospector | 93 | 4.2558 | 1.2779 | | |

There is sufficient support on this hypothesis to say that it appears the complexity of Prospector new product development demands a higher level of formalization of procedures and rules in order to effectively deal with that complexity. This contradicts the Miles and Snow (1978) description of the two strategic types depicting the Defender as more rigid and structured than the Prospector. Not surprisingly, the Ruekert and Walker (1987) study predicted higher formalization in Defenders as apparent logic would demand. They found, however, that the differences between Defenders, Analyzers, and Prospectors was practically nil, with the results not significant. Dyer and Song (1995), using a Japanese sample, also predicted the expected Defender dominance on formalization, but found that the Prospector firms in their sample used formalization more. The Dyer and Song results were significant.

This finding has certain implications for the new product development process. It appears that the more uncertain and complex the task environment in new product development the more formalization needs to be used as a conflict handling mechanism. Quality formalized communication becomes especially important in an interfunctional situation where two groups are as different in background and perspective as are R&D and marketing. Quality formalized communication also becomes extremely important in a process such as new product development where change is constant. Without such communications misinformation and misunderstanding will lead to a significant rise in conflict between the R&D and marketing areas. It appears that the high level of formalization in Prospectors played a part in the lower level of conflict found in the Hypothesis 1 analysis.

Management of formalization to handle conflict situations within the firm presents concerns for both of the strategy types. In Prospector firms the importance of formalization may not be sufficiently emphasized due to their inherent structure. Although, based on this data set,

the quantity of formalization use is apparent in Prospectors, the quality of formalized communications would still need to be emphasized. In Defender firms, formalization may be taken for granted due to their inherent structure. Emphasis might need to be put on both quantity and quality of formalization for these firms. It appears that the lower level of perceived conflict in Defender firms played a part in their higher level of conflict.

***Statistical Test of Hypothesis 5.***

$H_5$: In conflict situations between R&D and marketing, Prospectors will rely on centralization more than Defenders.

H5 was not supported. Based on the total combined responses, Prospectors were found to be significantly different from Defenders on the construct centralization with $F = 24.88$, $p < .0001$. The results, however, were the reverse of that predicted in the hypothesis. Defenders had the higher mean, 3.009, versus 2.4657 for the Prospector responses. H5 was not supported by R&D at $F = 1.87$, $p < .1743$, with the Defender mean at 3.2017 and the Prospector mean at 2.8064. The direction of the means duplicated the total combined responses, but the R&D group results were not significant. Finally, H5 was not supported by the results of the marketing group with $F = 30.55$, $p < .0001$. Again Defenders had the higher mean at 3.3089 versus 2.2129 for Prospectors. Table 46 summarizes the ANOVA results for H5.

**TABLE 46**

**Summary Data for Hypothesis 5**

| Hypothesis | Group | Strategy | N | Mean | Standard Deviation | F | p > F |
|---|---|---|---|---|---|---|---|
| H5: Prospectors will rely on centralization more than Defenders. | Combined | Defender | 128 | 3.009 | 1.5974 | 24.88 | 0.0001 |
| | | Prospector | 162 | 2.4657 | 1.2545 | | |
| | R&D | Defender | 44 | 3.2017 | 1.5655 | 1.87 | 0.1743 |
| | | Prospector | 69 | 2.8064 | 1.4547 | | |
| | Marketing | Defender | 83 | 3.3089 | 1.5795 | 30.55 | 0.0001 |
| | | Prospector | 93 | 2.2129 | 1.0189 | | |

When looking at centralization as a construct in a conflict handling context, centralization is the use of hierarchy, or authority to settle disputes, and it presents a mixed picture in this role. McCann and Galbraith (1981) discuss the advantages of centralization as a conflict handling method, finding it quick and unambiguous. They describe centralization as efficient in a conflict context. They also discuss the disadvantage of centralization because it most often moves resolution out of the hands of the parties involved. Given that research shows that conflict handling is best carried out by those involved, McCann and Galbraith suggest that hierarchical conflict handling may be efficient but not effective.

Hypothesis 5 reversed the intuitive prediction that would be expected based on the Miles and Snow (1978) descriptions of their strategic types. When Ruekert and Walker (1987) proposed that Defenders would use centralization more than Prospectors as a conflict handling mechanism, their finding was statistically significant, but the means were reversed--i.e., Prospectors used centralization more than Defenders. Dyer and Song (1995) in their Japanese sample found the same reversal of means and significance, concluding that the higher complexity of Prospector new product development simply demands more methods of conflict management, and Prospectors make use of every mechanism available to them. Thus, given the extant findings on this construct in the conflict literature, the results from this study are surprising.

It appears that more is operating on the centralization issue than the previously mentioned factors. Certainly it suggests that the use of centralization as a conflict handling mechanism varies with the context beyond the simple difference of strategic type. One possible explanation may be that this finding is unique to the electronic industries or is heavily impacted by some particular characteristic of those industries, such as volatility. This can only be settled by further research.

***Statistical Test of Hypotheses 6 and 7.***

$H_6$: In conflict situations between R&D and marketing, Prospectors will use behavioral conflict handling methods more than structural methods.

$H_7$: In conflict situations between R&D and marketing, Defenders will use structural conflict handling methods more than behavioral methods.

H6 and H7 were partially supported. H6 and H7 were supported by the total combined responses and by the marketing group responses, but not by the R&D group responses. The results of the repeated measures MANOVA on the total combined responses indicated that Prospectors are significantly different from Defenders in the methods used to handle conflict, $F = 7.11$, $p < .0081$. Prospectors had the higher mean, 4.3387, versus 4.1989 for Defenders on the behavioral method, supporting the prediction that Prospectors would use more behavioral conflict handling methods than structural ones. Defenders had the higher mean, 3.5934, versus 3.4377 for Prospectors on the structural method, supporting the prediction that Defenders would use more structural methods than behavioral ones.

MANOVA results based on the R&D responses did not support H6 and H7 with $F = .88$, $p < .3492$. Neither ANOVA analysis, on behavior or structure, was significant at $F = .03$, $p < .8589$ and $F = 1.18$, $p < .2794$ respectively. The means were virtually the same for behavior, Defenders at 4.2808 and Prospectors at 4.2971. On structure the Prospector means were higher than the Defenders at 3.7119 and 3.5168. MANOVA results based on the marketing responses strongly supported H6 and H7 with $F = 20.83$, $p < .0001$. Both of the ANOVA analyses were significant at $F = 17.78$, $p < .0001$ for behavior and $F = 10.02$, $p < .0018$ for structure. Means for both behavior and structure were in the predicted directions. On behavior the Prospector mean was higher at 4.3696 than the Defender mean at 4.1532. On structure the Defender mean was higher at 3.6098 than the Prospector mean at 3.2344. The predictions of H6 and H7 were solidly

supported by the marketing group. The predictions of H6 and H7 were just as solidly not supported by the R&D group. Table 47 summarizes the MANOVA and ANOVA findings.

**TABLE 47**

**Summary Data for Hypotheses 6 and 7**

| Hypothesis | Group | Strategy | N | Behavioral Method | | Structural Method | | F[a] | p > F[a] |
|---|---|---|---|---|---|---|---|---|---|
| | | | | μ | s.d. | μ | s.d. | | |
| H6: Prospectors will use behavioral methods more than structural methods. | R&D & Mktg. | Defender | 128 | 4.1989 | 0.3801 | 3.5934 | 0.8951 | 8.78[b] / 2.30 | 0.0033 / 0.1304 |
| | | Prospector | 162 | 4.3387 | 0.4133 | 3.4377 | 0.8453 | | |
| H7: Defenders will use structural methods more than behavioral methods. | R&D | Defender | 44 | 4.2808 | 0.4781 | 3.5168 | 0.9218 | 0.03[c] / 1.18 | 0.8589 / 0.2794 |
| | | Prospector | 69 | 4.2971 | 0.4730 | 3.7119 | 0.9358 | | |
| | Mktg. | Defender | 83 | 4.1532 | 0.3127 | 3.6098 | 0.8617 | 17.78[d] / 10.02 | 0.0001 / 0.0018 |
| | | Prospector | 93 | 4.3696 | 0.3624 | 3.2344 | 0.7106 | | |

[a] Behavioral results/ Structural results.
[b] MANOVA F = 7.11, p < 0.0081
[c] MANOVA F = 0.88, p < 0.3492
[d] MANOVA F = 20.83, p < 0.0001

***Statistical Tests of Hypotheses 8, 9 and 10.***

$H_8$: In conflict situations between R&D and marketing, a positive association will be found between integrating conflict handling behaviors and constructive conflict.

$H_9$: In conflict situations between R&D and marketing, a negative association will be found between forcing and avoiding conflict handling behaviors and constructive conflict.

$H_{10}$: In conflict situations between R&D and marketing, a positive association will be found between constructive conflict and new product development success.

Hypotheses 8, 9, and 10 were supported by the total combined responses, the R&D responses and the marketing responses. Based on the total combined responses, integrating behaviors were found to have a positive correlation with constructive conflict of .5396, p <

behaviors were found to have a positive correlation with constructive conflict of .5396, $p < .0001$. Forcing was found to have a negative correlation with constructive conflict of -.3461, $p < .0001$, and avoiding was found to have a negative correlation with constructive conflict of -.2752, $p < .0001$. Constructive conflict was found to have a positive correlation with crossfunctional success of .5252, $p < .0001$. Constructive conflict was found to have a positive correlation with new product success of .2627, $p < .0001$.

Based on the R&D responses, integrating conflict handling behaviors were found to have a positive correlation with constructive conflict of .5513, $p < .0001$. Forcing was found to have a negative correlation with constructive conflict of - .2672, $p < .0042$, and avoiding was found to have a negative correlation with constructive conflict of - .2161, $p < .0215$. Constructive conflict was found to have a positive correlation with crossfunctional success of .5297, $p < .0001$. Constructive conflict was found to have a positive correlation with new product success of .2832, $p < .0024$.

Based on the marketing responses, integrating conflict handling behaviors were also found to have a positive correlation with constructive conflict of .5330, $p < .0001$. Forcing was found to have a negative correlation with constructive conflict of - .4163, $p < .0001$, and avoiding was found to have a negative correlation with constructive conflict of - .3227, $p < .0001$. Constructive conflict was found to have a positive correlation with crossfunctional success of .5148, $p < .0001$. Constructive conflict was found to have a positive correlation with new product success of .2497, $p < .0008$. Table 48 summarizes the correlation results.

The data show that the impact of conflict handling behaviors on constructive conflict within firms is significant. Several points should be made about these results. First, the

## TABLE 48

### Correlations Between Sum Scale Measures for Hypotheses 8, 9 and 10

| Hypothesis | Construct | Corr./Prob. (Combined) | Corr./Prob. (R&D) | Corr./Prob. (Marketing) |
|---|---|---|---|---|
| H8: A positive association will be found between integrating conflict handling behaviors and constructive conflict. | Integrating | .5396<br>.0001 | .5513<br>.0001 | .5330<br>.0001 |
| H9: A negative association will be found between forcing and avoiding conflict handling and constructive conflict. | Forcing | -.3461<br>.0001 | -.2672<br>.0042 | -.4163<br>.0001 |
| | Avoiding | -.2752<br>.0001 | -.2161<br>.0215 | -.3227<br>.0001 |
| H10: A positive association will be found between constructive conflict and new product development success. | Crossfunctional Success | .5252<br>.0001 | .5297<br>.0001 | .5148<br>.0001 |
| | Market Success | .2617<br>.0001 | .2832<br>.0024 | .2497<br>.0008 |

association between integrative conflict handling behaviors is fairly strong, i.e., over .5 for each of the analyses, and it is consistent from group to group. R&D and marketing personnel are very similar in their responses. Likewise, the association between constructive conflict and the two performance measures is quite similar for the two groups. In both cases the association between constructive conflict and crossfunctional success is strong. These constructs seem to have a very similar impact for personnel in R&D and marketing. An inference that might be made is that integrative conflict handling behavior is equally critical to positive conflict interactions in these two groups. Similarly, constructive conflict is equally critical to good crossfunctional relationships in the new product development process.

Forcing and avoiding were found to have a negative influence on conflict handling. Given the authoritarian structure in many modern organizations, the strong negative association between forcing and constructive conflict poses problems for successful new product

development in many firms. This is because managers commonly force through decisions on many levels in many firms. These data indicate that forcing in conflict situations leads in many instances to counterproductive outcomes. Managers, for example in Defender firms, might want to examine their behaviors. Care needs to be taken in training personnel to understand that where forcing decisions may have a place in other organizational interactions, in conflict situations forcing may produce an efficient outcome in the short term, but produce an ineffective outcome in the long term. Additionally, it appears that force impacts more negatively on conflict situations involving marketing personnel. Perhaps marketing personnel, who are often creative and people-oriented, must be handled more with integrative behaviors, where R&D, who are more structured and task-oriented, understand and accept the efficiency of at least some forced conflict handling.

What is known about social desirability and conflict behaviors suggests that personnel would least like to have conflict handled by avoiding (Thomas & Kilmann, 1975). Ironically, managers avoid avoiding more than forcing, even though forcing, a commonly practiced and management sanctioned conflict behavior, has much stronger negative consequences on constructive outcomes.

***Statistical Test of Hypothesis 11.***

$H_{11}$: In conflict situations between R&D and marketing, constructive conflict will be associated with moderate levels of conflict.

Hypothesis 11 was not supported by the total combined, R&D, or marketing responses. In testing this hypothesis, the constructive conflict responses were plotted against moderate conflict responses and visually reviewed to ascertain whether the inverted U-shaped distribution

predicted by the literature was evident. No inverted U-shape was discerned. Visual inspection of the plot, instead, indicated a slightly negative slope for the total combined, R&D, and marketing responses.

For the total combined responses, the t-test comparing the means of moderate conflict responses to non-moderate on the construct variable was performed with $t = -4.2918$, $p < .0001$, indicating a significant negative, linear relationship. For the two groups, the t-test comparing the means of moderate conflict responses to non-moderate on the construct variable was -2.36, $p < .0202$ for R&D and -3.70, $p < .0003$ for marketing. For the total combined responses, the quadratic regression test for curvilinear relationships yielded $F = 1.09$, $p < .2975$. The quadratic regression test for curvilinear relationships yielded $F = .00$, $p < .9627$ for R&D and $F = 3.43$, $p < .0659$ for marketing. No curvilinear relationship exists between moderate conflict levels and constructive conflict based on this data set

Hypothesis 11 questioned a relationship that is assumed in the conflict literature, frequently without empirical support. It states that higher levels of positive outcomes of conflict will be associated with moderate levels of conflict. This is based on the literature's conclusion that too much or too little conflict is less productive than moderate conflict. The results of this hypothesis challenge the way that much conflict research has been done. One possible implication here is that respondents automatically define *conflict* as bad. When questioned about conflict they assume that conflict is negative. This suggests that more work should be done on what has been called contention or controversy, disagreement that is task or opinion oriented, i.e., without negative emotional baggage for respondents. It may be very important to separate conflict research into conflict and controversy, and then look at the behaviors that are used to handle each of these disagreement circumstances. Some work has been done in this area, but, to

date, the output has been limited and is very small compared to the more traditional conflict research.

## Summary

Chapter 6 has presented the model and hypotheses testing for this study (See Table 49 for a summary of the hypotheses and results). It was found that conflict handling mechanisms do vary according to the strategic position of organizations. It was also found that certain conflict behavior is more associated with certain strategic types. Chapter 6 found that constructive conflict is positively associated with integrative conflict behaviors and negatively associated with forcing and avoiding behaviors. The much discussed inverted U-shape relationship between positive conflict outcomes and the level of conflict was also tested, but not supported. The suggestion was made that conflict research might be well served to look at conflict behaviors and controversy behaviors separately. Several managerial implications were discussed. Chapter 7 will discuss the implications of the study findings, limitations of the study, and future research possibilities.

## TABLE 49

## Summary of Hypothesis Testing Results

| Hypotheses | | Instrument | Analysis | Results |
|---|---|---|---|---|
| H1: | Ds will perceive higher conflict levels than Ps. | Jaworski & Kohli (1993)<br>Ruekert & Walker (1987) | ANOVA | Supported |
| H2: | Ps will use integrating behaviors more than Ds. | Rahim (1983) | ANOVA | Supported |
| H3: | Ds will use forcing and avoiding behaviors more than Ps. | Rahim (1983) | MANOVA | Supported |
| H4: | Ps will rely on formalization more than Ds. | Hage & Aiken (1967) | ANOVA | Partially Supported |
| H5: | Ps will rely on centralization more than Ds. | Hage & Aiken (1967) | ANOVA | Not Supported |
| H6: | Ps will use behavior more than structure to handle conflict. | Hage & Aiken (1967)<br>Rahim (1983) | MANOVA<br>Repeated Measures | Partially Supported |
| H7: | Ds will use structure more than behavior to handle conflict. | Hage & Aiken (1967)<br>Rahim (1983) | MANOVA<br>Repeated Measures | Partially Supported |
| H8: | Positive association between integrating behavior and constructive conflict. | Rahim (1983)<br>Barker, Tjosvold, and Andrews (1988) | Correlation | Supported |
| H9: | Negative association between forcing and avoiding and constructive conflict. | Rahim (1983) | Correlation | Supported |
| H10: | Positive association between constructive conflict and new product development success. | Barker, Tjosvold, and Andrews (1988)<br>Song (1991; 1993) | Correlation | Supported |
| H11: | Constructive conflict to be associated with moderate levels of conflict. | Barker, Tjosvold, and Andrews (1988) | T-test<br>Quadratic Regression | Not Supported |

# CHAPTER 7

## Discussion and Conclusion

### Introduction

Chapter 7 will present the discussion and conclusion of the study. The overview section will first present a brief summary of goals. This will be followed by a summary of the study findings. Then, the first section will end with a comparison of this study's results to those of the previous Ruekert and Walker (1987) study. The implications section will first discuss the managerial implications of the study for the new product development process. Then, it will discuss the similarities and differences found between the R&D and marketing responses. Finally, the chapter will conclude with a summary of study limitations and future research opportunities.

### Overview

***Study Goals.*** The conflict literature has shown that conflict and conflict behaviors are sensitive to context (Bonoma, 1976; Ruekert & Walker, 1987). Thus, it is important that conflict issues that apply to the new product development process be researched within that context. One goal of this study was to study conflict handling mechanisms in a new context by using a sample of R&D and marketing managers within the electronic industries. Another goal for the study was to verify previous findings for that new context, i.e., the relationships between conflict behaviors and positive outcomes. Still another goal was to challenge previous findings or assumptions within that new context, i.e., the strategic differences expected between Prospector and Defender firms, and the U-shaped relationship between conflict levels and positive outcomes. Last,

another goal was to test the relationship between a relatively new construct, constructive conflict, and new product success. Each of these goals helps to form a logical progression from conflict handling mechanisms, behavioral and structural, to the ultimate goal of a productive new product development process.

***A Summary of Findings.*** One of the important issues dealt with in this study is that our behavior during conflicts impacts the outcome of those exchanges. This is true whether we are considering a fight between friends or a disagreement at work. Managers can affect conflict outcomes in a positive or negative fashion by selecting specific conflict handling behaviors themselves and training their employees to select specific conflict handling behaviors. In fact, conflict handling behavior can become a *tool* that managers use to control their own behavior and to influence the behavior of others. Carefully considered application of appropriate conflict behavior by managers is important to the firm, because positive conflict outcomes can help establish and maintain good relationships. These good relationships, in turn, can ultimately result in greater success in the new product development process (Souder, 1988).

Based on the results from the model and the individual hypothesis testing in the study, the following statements summarize the findings. The first stage of the model showed that, of the three conflict behaviors studied (integrating, forcing, and avoiding), integrating behaviors have the largest positive impact on constructive conflict. Forcing and avoiding, on the other hand, have a substantial negative impact on constructive conflict, especially as perceived by marketers. Of the two structural conflict handling methods, formalization has a large positive impact on constructive conflict. Centralization has a mildly negative impact. The second stage of the model showed that constructive conflict does have a large and positive impact on new product success. That impact is strongest on crossfunctional relationships in new product

development. However, the impact of constructive conflict on new product success, as measured by market results, is surprisingly strong given the number of other factors influencing that particular success measure.

On the question of strategic differences, the study found significant differences in the conflict climate and behaviors in the R&D/marketing interface based on the strategy firms pursued. Conflict levels were perceived to be higher in Defender firms. Prospectors were perceived to use integrative conflict behaviors more than Defenders. Defenders were perceived to use forcing and avoiding more than Prospectors. Prospectors were perceived to use formalization as a conflict handling mechanism more than Defenders. It appears that Defenders may use centralization more than Prospectors, although results were mixed. Prospectors were perceived to use behavioral conflict handling more than structural, and Defenders use structural conflict handling more than behavioral, according to marketers. R&D, however, did not perceive these differences. Finally, the assumed inverted U-shaped relationship between conflict levels and positive outcomes in conflict was not supported by this data set.

***A Comparison.*** Some of the questions dealt with in this study were approached by a similar study published in *The Strategic Management Journal* in 1987 by Ruekert and Walker. Their study was exploratory in nature dealing with strategy/conflict issues between R&D and marketing in a single firm, using three divisions that the authors had identified as one Defender, one Prospector, and one Analyzer. Due to problems in gaining sufficient returns from R&D, the findings are predicated on 114 marketing responses, except for the discussion of open-ended questions included in the survey. The study remains today one of the only strategic studies on conflict issues of this kind and perhaps the best known.

In comparing these two studies, the findings of this study and those of the Ruekert and Walker study are almost totally divergent. Ruekert and Walker predicted: 1) that Prospectors have higher levels of conflict than Defenders (supported); 2) that Defenders use formalization more than Prospectors (not supported); and 3) that Defenders use centralization more than Prospectors (not supported, significant and reversed). This study predicted: 1) that Defenders have higher levels of conflict than Prospectors (supported); 2) that Prospectors use formalization more than Defenders (supported); and 3) that Prospectors use centralization more than Defenders (not supported).

It should be noted that the questions on conflict level, formalization, and centralization pursued in this study were specifically included because of doubts raised by the logic, sampling, and findings of the Ruekert and Walker study. One prime explanation of the different findings would be that the Ruekert and Walker study surveyed only one company with three divisions classified as three strategic types (Defender, Prospector, and Analyzer). Thus, the conflict level, formalization, and centralization findings might easily reflect only the conflict climate of these three particular divisions of one organization. Another possible explanation is that some critical difference in conflict situations exists between the industrial manufacturing firm in the Ruekert and Walker study and the electronic firms surveyed in this study. Additionally, a larger sample or a sample including R&D personnel in the Ruekert and Walker study might have resulted in findings more similar to those in this study.

This author submits that the results of this study extend our understanding of conflict beyond the results of the exploratory study by Ruekert and Walker (1987). Surveying a broad cross-section of high-technology firms represents a logical extension of the Ruekert and Walker work, taking analysis from an in-depth corporate setting to a broader, more inclusive setting. The

sample for this study, 188 different firms participating across at least nine different areas of the electronic industries, and input from both R&D and marketing personnel make the results far more generalizable.

The study findings add to those of Ruekert and Walker, extending our knowledge of the relationship between strategic position and conflict handling mechanisms. The research questions here were approached from a somewhat different point of view as to the critical influences on conflict. Ruekert and Walker focused on the environment's complexity and stability. This study focuses on the impact on conflict of the conflict handling mechanisms themselves. Also, this study, while asking very specific questions on conflict handling mechanisms, looks at the links that exists between conflict handling mechanisms and positive conflict outcomes, as well as between the positive conflict outcomes and new product performance.

***A Comparison of R&D and Marketing Responses.*** The findings of this study indicate that R&D and marketing perceptions are overall very similar relative to the hypotheses proposed. Eight of the eleven hypotheses were supported by the total combined responses, as well as the R&D and marketing groups individually. In particular, conflict behaviors were found to elicit similar responses with the exception of the level of impact of forcing and avoiding behaviors on constructive conflict. This finding showed that forcing and avoiding conflict behaviors have a far more negative effect on constructive conflict as perceived by marketers. One explanation of this might be that marketing in its creative aspects enjoys closer, more informal relationships in general and finds imposed or avoided conflict solutions less tolerable. This might be compounded by R&D personnel having more formal, structured relationships and finding imposed or avoided conflict solutions somewhat more acceptable.

The hypotheses in which differences were found between R&D and marketing responses all centered around structural conflict handling methods. In hypotheses 5, 6, and 7 R&D personnel did not perceive differences between Prospectors and Defenders on centralization, and on the use of behavioral conflict handling mechanisms versus structural ones. In each case, the findings were not significant. For Hypothesis 5 the direction of the means was as predicted, however. In Hypotheses 6 and 7 the means were virtually identical for behavioral methods and Prospector means were higher on structure than Defenders. It appears that marketing personnel see strategic differences here that R&D personnel do not. A possible implication is that R&D units' part of the R&D/marketing interface is more stable in its structural design. The use of structural mechanisms for conflict handling by R&D units, especially centralization, may be very similar across strategic types. This would support previous literature in characterizing R&D as more structured and authoritarian.

## Managerial Implications

It is of prime importance to new product development managers to skillfully manage conflict, because highly conflictful relations between R&D and marketing can lead to significant loss of productivity (Souder 1980, 1981, 1988). Today, productivity loss in the interface is exacerbated by a variety of problems that beset the new product development manager. Keen differences in points of view between the functional areas, e.g., quality levels, time orientations, and customer wants and needs, as well as the uncertainty, complexity, and volatility of the business environment, plague the manager. All of these can contribute to increased conflict, thereby raising the demands made on managers to manage the disagreements. The following text will offer ten prescriptions to assist managers in dealing with conflict situations within their organizations.

***Prescription One.*** Recognize that personnel are often at a loss to know how to appropriately handle conflict. Most managers and their personnel have received no training in conflict management and do not understand the relationship between conflict handling behaviors and the outcomes for the organization. Many have never thought about the conflict climate in their organization and what they might proactively do to manage it. Most managers and their personnel have been raised in an environment where the major influences on their lives, family, church, school, and society, have gone to great lengths to tell them that disagreeing is not good. Conformity should be the goal. It is this societal training that has resulted in the managers in one study saying that they spend up to 25 % of their time handling conflict and want more training in handling these situations (Rahim, 1983). Yet, most managers, due to their societal training, want first to reduce conflict. The results of this study suggest that management of conflict is the true key.

***Prescription Two.*** Pursue the appropriate conflict goals. This study is based on the central concept that managers who deal with conflict in the new product development process within organizations must first have the right goals for conflict management. This study presents constructive conflict as one critical goal for managers and firms desiring to control their conflict climate in order to benefit new product development. Hypothesis 10 establishes a positive and strong association between constructive conflict and new product success--both from a relationship and a marketplace perspective. Constructive conflict can be defined for managers as conflict that leads to positive relationships and positive work outcomes. If the manager sees that personnel know each other better and are enthused to complete their tasks as a result of well managed conflict, then he or she knows constructive conflict has taken place.

The constructive conflict goal provides a necessary frame of reference. The operative assumption in most organizations today is that conflict is bad. On the contrary, conflict is a necessary part of the process of developing new ideas and products. It is only when ideas diverge from the status quo that new products can develop and organizations change. A goal of constructive conflict can help managers to see that an appropriate conflict climate, one that encourages certain kinds of conflict behaviors, produces positive outcomes that are sorely needed for a competitive new product development process. The results of this study indicate that the importance of managerial adoption of the constructive conflict goal extends to all firms and is not tied to a single strategic position.

***Prescription Three.*** Assess your organization's strategic position in order to understand the conflict environment in which you operate. A clear understanding of company new product strategy generates a *baseline* from which managers can assess the conflict environment in which he or she will manage the new product development process. Managers can and should analyze their firm's current strategic posture. Understanding a firm's strategic position can tell the manager the most likely behaviors to expect to surface in conflict situations (and, thus, the conflict climate of the firm), the expected frequency of conflicts, and what tools that manager already inherently has available to him or her to manage organizational conflict.

Thus, a new product development manager in a Prospector firm would most likely find a baseline that would include high use of integrative conflict behaviors (and a conflict climate reflecting that), a relatively high number of complex conflicts, a relatively low level of perceived conflict, and personnel with a reasonably high level of skill in both verbal and written communication. Conflict in Prospector firms tends to be complex and spread throughout the organization in response to many individuals and groups generating ideas. In response to this

complexity, aggressive new product developers must of necessity communicate frequently on many routine, as well as non-routine interactions. This generally leads to greater skill in interaction and better understanding between functional units, a happy outcome for the crossfunctional new product development process.

A new product development manager in a Defender firm would most likely find a baseline including high use of forcing and avoiding conflict behaviors (and a conflict climate reflecting that), a relatively low number of conflicts, a relatively high level of perceived conflict, poorly developed skill levels in verbal communication and well developed skill levels in written communication. On the positive side for conflict management, these less aggressive new product developers need fewer conflict handling mechanisms and have the efficient conflict handling mechanism of authority (centralization) built into their firm structure. On the negative side, centralization has a negative impact on constructive conflict and leads, as a structural phenomenon, to the use of forcing and avoiding conflict behaviors.

***Prescription Four***. Use your strategic position to guide you in managing your organization's conflict situations in new product development. Managers in Prospector firms should go with their firm's strengths in conflict handling, but not rest on their laurels. Prospectors in general enjoy a high level of skill at communicating , a high use of integrative conflict behaviors, and a high level of formalization. Integrative conflict behaviors and formalization will lead to constructive outcomes for their new product development process. Additionally, the use of multiple conflict handling mechanisms suggests that Prospector managers need to recognize that a few simple mechanisms to handle conflict will not work well for them. The need for multiple mechanisms was predicted by Miles and Snow (1978), but not that those mechanisms would include heavy use of formalization. Prospector managers must

assure a broad range of conflict handling tactics in order to deal with the complexity found in their organizations.

Prospector managers need to recognize, that quantity of interaction is not all there is to establishing a constructive conflict climate. Quality is just as important. Because formalization is not a mandated part of organization structure for these firms, managers, while maintaining their high use of integrating behaviors, should also develop formal conflict management practices of high quality. Because Prospectors aggressively promote new product development, failure to provide open forums for different thoughts and ways of doing things will directly impact the creative process in these firms--irrevocably damaging new product success. Conflict, i.e., the airing of differences, cannot be separated from the creative process.

Defenders use a higher level of forcing and avoiding behaviors in conflict situations than do Prospectors, a phenomenon probably tied to the authoritarian and bureaucratic nature of the Defender firm. Unfortunately, forcing and avoiding are also tied to higher levels of conflict and lower levels of constructive outcomes. Where forcing and avoiding may be appropriate behaviors in other decision areas of the firm, these behaviors are not appropriate in new product development conflict situations. This environment, even within the Defender firm, is crossfunctional and should ideally resemble that of the Prospector for success. Too, decreased forcing and avoiding behaviors and increased integrative behaviors should significantly lower the perceived conflict levels for Defenders.

Managers raised in the authoritarian school of management, i.e., the school of scientific management, may never have considered that forcing through "solutions" in their firm has led to negative results in terms of conflict handling or new product success. They often see their actions as "getting things done." Also, it would probably surprise them to learn that the study's

findings indicate the use of force has a far more negative impact than avoidance on constructive conflict. These managers might want to rethink their conflict handling behaviors if they realize that unproductive conflict handling behaviors work their way to the bottom line.

Defender managers have an inherently formalized organization, which has a positive effect on constructive conflict. However, Defender communication skills suffer because they carry out their work sequentially and vertically, making interfunctional exchange less frequent and generating less concern for relationships with other functional areas. This lack of concern often leads to a disregard for interpersonal skills, when good communication skills are among the most critical to successfully managing conflict (Souder, 1988). Although the structural framework of Defender firms assures a certain quantity of formal communication within these firms, Defenders must work hard to ensure the quantity and quality of their formal communications across the R&D/marketing interface.

***Prescription Five.*** Focus your firm's efforts on increasing integrative behaviors and reducing forcing and avoiding behaviors in general in handling conflict situations in the new product development process. The hypothetical model, the construct correlations, and the hypothesis testing in this study all support this conclusion no matter what strategic position you pursue.

***Prescription Six.*** Use conflict handling mechanisms as a competitive advantage. Prospectors and Defenders should pursue their chosen strategies. They do not compete with each other. They compete with other Prospector and Defender firms. This means that what a manager finds upon gauging the baseline for conflict handling within his firm must then be compared to the key competitors within the industry. This is another way of saying, essentially, that all things are relative. The real question becomes how to use conflict handling practices to

give the firm a competitive advantage in new product development, whether that is a quality or quantity issue. This study clearly shows that when dealing with the new product development process integrative behaviors and formalization can substantially help any firm to create a better process. The manager's challenge is to do a better job of using integrative behaviors and formalization than the rest of his competitors in the market.

***Prescription Seven.*** Assess both managers and general employees for their preferred conflict handling behavior style. The findings of this study suggest that this assessment should be a primary employee qualification in new product development. It can be approached from either a hiring/selection or training point of view. For example, an employee being considered for promotion to a management position in either marketing or R&D should be reviewed for what conflict handling behaviors he or she prefers to use in dealing with conflict situations. This is critical to the new product development process, because leaders have a large impact on corporate climate, and thus on new product success. The firm should pursue those who prefer integrative conflict handling behaviors for new product development leadership positions, or at least be willing to provide training for those who do not.

It would be worth the firm's while to assess all potential and existing employees who work within the new product development process for their preferred conflict handling behaviors. This would aid in selecting personnel that would enhance the new product development process and/or identifying those needing training in conflict handling procedures.

***Prescription Eight.*** Tie conflict handling behavior styles and actions to performance evaluation and reward systems. A powerful way to send a message to employees is to tie certain benefits to desired behaviors. This can be done through performance evaluation criteria, pay, promotion, recognition, and other opportunities. If integrative behaviors and quality formalized

procedures for conflict situations are rewarded, they are much more likely to happen. Likewise, if forcing and avoiding conflict behaviors do not get rewarded, then those behaviors will be lessened. A decision to tie conflict handling behaviors to rewards also sends a subtle message that conflict is not inherently bad. Finally, such a decision is also an obvious and effective expression of top management support for appropriate conflict handling.

***Prescription Nine.*** Recognize that R&D and marketing personnel in certain instances work from different perceptual points of view. The study shows that marketers see a much more negative impact on constructive conflict when forcing and avoiding conflict handling behaviors are used than do R&D employees. Also, marketers clearly distinguished between behavioral and structural mechanisms, while R&D personnel did not. This suggests that firms should initiate some sensitivity training for these two groups. For example, marketing needs to understand that R&D is apparently more comfortable with forced or avoided conflict handling and not to overreact to such an approach. R&D needs to understand that a key partner in new product development is more productively approached during conflict situations if integrative behaviors are used.

***Prescription Ten.*** Focus on managing conflict situations. Managers, whether in Prospector-like firms or in Defender-like firms, need to focus the previous prescriptions on conflict situations. This study speaks only to the new product development process and to conflict handling. It does not suggest that Defenders stop being Defenders or that Prospectors rest on their laurels. The suggestions given are relative to the management decisions surrounding conflict situations only. They do not refer to other operational decisions, and they are not prescriptions for inertia.

***Study Limitations.*** This study has looked at the importance of conflict handling mechanisms to constructive conflict and the importance of constructive conflict to new product success. It should be noted that conflict handling mechanisms are only part of what leads to a constructive conflict climate in organizations. This study does not pretend to address all of the pertinent questions to be asked about this topic. It is a study focused on the specific question of behavioral and structural conflict handling mechanisms. There is more to learn about the factors leading to constructive conflict such as leadership, corporate climate, the causes that have set up the conflict situation, the issue of conflict history, and the consistency of conflict handling behavior. There is also more to be learned about the factors leading to new product success.

The sample used for this research presents the perceptions of R&D and marketing managers in the electronic industries. As such, this study is a major step forward from the Ruekert and Walker study in providing generalizable results. It has included close to 200 firms in nine sectors of a volatile industry. Nonetheless, generalization of the findings to other industries should be approached with caution. Of the firms participating, 27.6 % were electronic component manufacturing firms and 29.3% were telecommunication equipment manufacturers. The large numbers of component and telecommunication personnel may make the results most relevant for similar firms.

The respondents for these firms were R&D and marketing managers. That might imply that the results here are managerial in viewpoint and may not be generalizable to the rank and file R&D and marketing employee, because the study did not tap into the thoughts and feelings of the personnel at large within the R&D and marketing areas. It is important to note, however, that leaders of functional areas assume role behavior reflecting the position of their groups (Barclay, 1991; Katz & Kahn, 1978). Thus, it was felt that R&D and marketing managers could give an

accurate group perspective in this type of research. Nonetheless, caution is advised in interpreting results.

Finally, the electronics industry is a highly surveyed industry and one in which business personnel in it are short on time. This has played a part in the small response numbers for the study. Naturally, caution should be used in interpretation of the study findings as a result of these small response numbers. They present a definite limitation of the study.

***Future Research.*** This study presented a two stage model. In the first stage, the impact of conflict handling behaviors on constructive conflict was assessed. There is certainly work to be done to determine what other factors significantly contribute to constructive conflict. A key goal for conflict researchers should be the development of an instrument to measure the constructive conflict climate of organizations. Such an instrument could provide a quick and accurate baseline for organizations desiring to implement conflict management training, thereby improving the new product development process. Theoretically, some of the assumptions behind this research are at odds with the current conflict research paradigm, as is apparent from the initial discussion of today's conflict research literature. Therefore, it would be interesting to consider how constructive conflict juxtaposes the underlying assumptions currently operating in the conflict research paradigm as well.

Having asked and answered some questions about conflict handling mechanisms, there remains the question of the optimal level of each of these behaviors and structural mechanisms in conflict situations. There also remains the question of how these mechanisms change or stay the same in different conflict situations, e.g., does the level of effective integrative conflict handling behaviors differ between a conflict situation caused by resource scarcity and one caused by unfair reward systems? It also remains to be seen absolutely why R&D personnel in Prospector

and Defender firms appear to be similar on structural mechanisms, while marketing personnel in these firms differ.

The second stage of the study's model looked at the contribution of constructive conflict to crossfunctional success and new product success. Further work should be done to clarify all of the factors impacting on successful crossfunctional relationships, such as personality, trust, reward systems, role clarity, authority, and risk-taking. Much work is currently being done on team building skills in organizations. The engendering of constructive conflict climates within teams would be of interest. Additionally, many firms that are smaller either will not have the resources in money or personnel to convert to a team structure. For these firms there will be the continued problems of dealing with crossfunctional relationships in a more traditional environment.

Another interesting direction for constructive conflict research might be exploring the relationship between constructive conflict and firm change in the new product development process. This could deal with conflicts tied to the rate of turnover in new product projects or with the structural and personnel changes taking place within many organizations today. It would also be of interest to explore what differences might be found in the behaviors associated with conflict as opposed to those associated with controversy.

## Conclusion

A two stage model and 11 hypotheses were presented in this study, probing the relationships between firm strategy, conflict handling mechanisms, constructive conflict, and new product success. The results from the study have suggested proactive ways that managers in the new product development process can assess their own conflict climate, change conflict behaviors in order to increase the likelihood of constructive conflict and, consequently, improve

the likelihood of new product success. The final message is that new product development managers, R&D or marketing, with a constructive conflict goal and baseline knowledge of their organizations' strategic posture, have another tool to help them achieve the level of new product success they and their companies desire.

# BIBLIOGRAPHY

# BIBLIOGRAPHY


Aldenderfer, M.S. & Blashfield, R.K. 1984. *Cluster analysis.* Newbury Park: Sage Publications.

Axelrod, R. 1984. *The evolution of cooperation.* New York: Basic Books.

Barclay, D. W. 1991. Interdepartmental conflict in organizational buying: The impact of the organizational context, *Journal of Marketing Research*, 28 (May): 145-159.

Barker, J., Tjosvold, D., & Andrews, I.R. 1988. Conflict approaches of effective and ineffective project managers: A field study in a matrix organization, *Journal of Management Studies*, (2): 167-178.

Barnard, C.I. 1938. *The functions of the executive.* Cambridge, MA: Harvard University Press.

Belsley, M.K., Kuh, E., & Welsch, R.E. 1980. *Regression diagnostic.* New York: John Wiley & Sons.

Blake, R.R. & Mouton, J.S. 1962. The intergroup dynamics of win-lose conflict and problem-solving collaboration in union-management relations. In M. Sharif (Ed.), *Intergroup relations*: 94-140. New York: John Wiley & Sons, Inc.

_____ & Mouton, J.S. 1964. *The managerial grid.* Houston: Gulf.

_____ & Mouton, J.S. 1978. *The new managerial grid.* Houston: Gulf.

Blake, R.R. & Mouton, J.S. 1985. *Solving costly organizational conflicts.* New York: Columbia University Press.

_____ Shepard, H.A., & Mouton, J.S. 1964. *Managing intergroup conflict in industry.* Houston, TX: Gulf Publishing Company.

Bleeke, J. & Ernst, D. 1993. *Collaborating to compete.* New York: John Wiley & Sons, Inc.

Bonnet, D.C.L. 1986. Nature of the R&D/marketing cooperation in the design of technologically advanced new industrial products. *R&D Management*, 16(2): 117-126.

Bonoma, T.V. 1976. Conflict, cooperation and trust in three power systems. *Behavioral Science*, 21: 499-514.

Boone, L.E. & Kurtz, D.L. 1992. *Contemporary marketing.* Fort Worth, TX: The Dryden Press.

Booz-Allen & Hamilton, Inc. 1981. *New products management for the 1980s.* Corporate Document.

Boulding, K. 1964. A pure theory of conflict applied to organizations. In R.L. Kahn & E. Boulding (Eds.), *Power and conflict in organizations*: 136-145. New York: Basic Books, Inc.

_____ 1964. Two principles of conflict. In R.L. Kahn & E. Boulding (Eds.), *Power and conflict in organizations*: 75-76. New York: Basic Books, Inc.

Brown, J.R. 1979. Channel cooperation: Its relationship to channel performance. In R.F. Lusch and P.H. Zinser (Eds.), in *Contemporary issues in marketing channels*: 87-101. Norman, OK: Center for Economic and Management Research, University of Oklahoma.

Burke, R.J. 1970. Methods for resolving superior-superordinate conflict: The constructive use of subordinate differences and disagreements. *Organizational Behavior and Human Performance*, 5(4): 393-411.

Campbell, D. & Fiske, D. Convergent and discriminant validation by the multitrait-multimethod matrix, *Psychological Bulletin*, 54: 81-105.

Cattell, R.B. 1965. Factor analysis: An introduction to essentials, the purpose and underlying models, the role of factor analysis in research, *Biometrics*, 21: 190-215; 405-435.

Chandler, A.D. 1962. *Strategy and structure*. Garden City, NY: Doubleday & Co., Inc.

Clark, J. 1988. Presidential address on the importance of our understanding organizational conflict. *The Sociological Quarterly*, 29(2): 149-161.

Cohen, M.D., March, J.G. and Olsen, J.P. 1972. A garbage can model of organizational choice, *Administrative Science Quarterly*, 17(1): 1-25.

Conant, J.S., Mokwa, M.P., & Varadarajan, P.R. 1990. Strategic types, distinctive marketing competencies and organizational performance: A multiple measures-based study. *Strategic Management Journal*, 11: 365-383.

Cooper, R. G. 1979. Identifying industrial new product success: Project Newprod. Industrial *Marketing Management*, 8: 124-135.

_____ 1979. The dimensions of industrial new product success and failure. *Journal of Marketing*, 43: 93-103.

_____ 1983. The impact of new product strategies. *Industrial Marketing Management*, 12: 243-256.

_____ 1985. Selecting winning new product projects: Using the NewProd system. The *Journal of Product Innovation Management*, 2: 34-44.

_____ 1990. New products: what distinguishes the winners? *Technology Management*, 22: 27-31.

Coser, L.A. 1956. *The functions of social conflict*. Glencoe, IL: The Free Press.

_____ 1968. *Continuities in the study of social conflict*. New York: The Free Press.

Daft, R.L. & Steers, R.M. 1986. *Organizations: A micro/macro approach*. Glenview, IL: Scott, Foresman and Company.

Davidson, H.J. 1976. Why most new consumer brands fail. *Harvard Business Review*, 54: 117-122.

Dentzer, S. 1990. The coming global boom. *U.S. News & World Report*, July 16: 22-28.

Deutsch, M. 1949. A theory of cooperation and competition. *Human Relations*, 2(2): 129-152.

_____ 1969. Conflicts: Productive and destructive. *Journal of Social Issues*, 25(1): 7-41.

_____ 1980. Fifty years of conflict. In L. Festinger (Ed.), *Retrospections on social psychology*: 46-77. New York: Oxford University Press.

Downs, G.W. & Mohr, L.B. 1976. Conceptual issues in the study of innovation. *Administrative Science Quarterly*, 21: 700-714.

Dvir, D., Segev, E., & Shenhar, A. 1993. Technology's varying impact on the success of strategic business units within the Miles and Snow typology. *Strategic Management Journal*, 14: 155-162.

Dwyer, F.R., Schurr, P.H., & Oh, S. 1987. Developing buyer-seller relationships. *Journal of Marketing*, 51(April): 11-27.

Dyer, & Song, X.M. 1995. The relationship between strategy and conflict management: A Japanese perspective. *Proceedings of the Academy of Marketing Sciences* (May).

Eaton, J.W. 1948. A conceptual theory of cooperation. *The American Journal of Sociology*, 54(2): 126-134.

Eisenhardt, K.M. 1989. Making fast strategic decisions in high velocity environments. *Academy of Management Journal*, 32: 543-576.

*Electronic Industries Association 1994 trade directory and membership list.* Washington, DC: EIA Department of Public Affairs.

Emery, F. 1967. The next thirty years: Concepts, methods and applications. *Human Relations*, 30: 199-237.

Filley, A.C. 1975. *Interpersonal conflict resolution*. Chicago: Scott & Foresman.

Fink, C.F. 1968. Some conceptual difficulties in the theory of social conflict. *Journal of Conflict Resolution*, 12: 412-460.

Fryxell, G.E. 1986. *The influence of generic strategy on the empirical relationship between business level product R&D expenditures and profitability*. Unpublished dissertation: Indiana University Graduate School of Business.

Galbraith, J.R. & Nathanson, D.A. 1978. *Strategy implementation: The role of structure and process*. St. Paul, MN: West.

Gray, J.L. & Starke, F.A. 1988. *Organizational behavior: Concepts and applications*. Columbus, OH: Merrill Publishing.

Gupta, A.K. 1984. A study of R&D/marketing interface and innovation success in high technology. Unpublished Ph.D. dissertation, The University of Syracuse.

_____, Raj, S.P. & Wilemon, D. 1985. The R&D-marketing interface in high-technology firms. *The Journal of Product Innovation Management*, 2: 12-24.

_____ Raj, S.P. & Wilemon, D. 1986. A model for studying R&D-marketing interface in the product innovation process. *Journal of Marketing*, 50(2): 7-17.

Hage, J. & Aiken, M. 1967. *Social change in complex organizations*. New York: Random House.

Hall, R.H. 1991. *Organizations: Structures, processes, & outcomes*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Hambrick, D.C. 1982. Environmental scanning and organizational strategy. *Strategic Management Journal*, 3: 159-174.

_____ 1983. Some tests of the effectiveness and functional attributes of Miles and Snow's strategic types. *Academy of Management Journal*, 26(1): 5-26.

_____ & Mason, P.A. 1984. The organization as a reflection of its top managers. *Academy of Management Review*, 9(2): 193-206.

Heilbroner, R.L. 1967. *The worldly philosophers* (3rd ed.). New York: Simon & Schuster.

Hopkins, D.S. 1980. New product winners and losers. *Conference Board Report*, #773, 1980.

_____ & Bailey, E.L. 1971. New product pressures. *The Conference Board Report*, 8: 16-24.

Hutt, M.D. & Speh, T.W. 1984. The marketing strategy center: Diagnosing the industrial marketer's interdisciplinary role. *Journal of Marketing*, 48(4): 53-61.

Jaworski, B.J. & Kohli, A.K. 1993. Market orientation: antecedents and consequences. *Journal of Marketing*, 57(3): 53-70.

Johnson, D.W., Maruyama, G., Johnson, R.T., Nelson, D. & Skon, S. 1981. Effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. *Psychological Bulletin*, 89: 47-62.

Katz, D. 1964. Approaches to managing conflict. In R.L. Kahn & E. Boulding (Eds.), *Power and conflict in organizations*: 105-114. New York: Basic Books, Inc.

Katz, D. & Kahn, R.L. 1966. *The social psychology of organizations*. New York: John Wiley & Sons, Inc.

Kerlinger, F.N. 1986. *Foundations of behavioral research*. New York: Holt, Rinehart, and Winston.

Kiel, G. 1984. Technology and marketing: The magic mix? *Business Horizons*, May-June: 7-14.

Kim, J. & Mueller, C.W. 1978. *Factor analysis: Statistical methods and practical issues.* Newbury Park: Sage Publications.

Kupfer, A. 1992. How American industry stacks up. *Fortune*, 125 (5): 30-46.

Lamb, C.W., Hair, J.F. & McDaniel, C. 1992. *Principles of marketing*. Cincinnati: South-Western Publishing Co.

Landsberger, H.A. 1960. The behavior and personality of the labor mediator. *Personnel Psychology*, 13: 329-347.

Lawrence, P.R. & Lorsch, J.W. 1967. *Organization and environment*. Cambridge, MA: Harvard University Press.

Lewicki, Roy J., Weiss, S.E., & Lewin, D. 1992. Models of conflict, negotiation and third party intervention: A review and synthesis. *Journal of Organizational Behavior*, 13: 209-252.

Likert, R. & Likert, J.G. 1976. *New ways of managing conflict*. New York: McGraw-Hill.

Little, B. 1984. Significant issues for the future of product innovation. *The Journal of Product Innovation Management*, 1: 56-66.

Lodge, G.C. 1987. The decline of United States competitiveness in the world economy: Some causes and remedies. In Corporate Leaders Forum (Eds.), *Strategy, Technology and American Industry*: 9-17. Boston: Harvard Business School Publishing Division.

Lucas, G.H. & Bush, A.J. 1988. The marketing-R&D interface: Do personality factors have an impact? *Journal of Product Innovation Management*, 5: 257-268.

MacDowell, J. 1984. The technology innovation system in Japan. *The Journal of Product Innovation Management*, 2: 165-172.

MacIver, R.M. 1937. *Society*. New York: Farrar & Rinehart, Inc.

McCann, J. & Galbraith, J.R. 1981. Interdepartmental relations. *Handbook of organizational design*, 2: 60-84.

McDaniel, S.W. & Kolari, J.W. 1987. Marketing strategy implications of the Miles and Snow strategic typology. *Journal of Marketing*, 51: 19-30.

Miles, R.H. 1980. *Macro organizational behavior*. Santa Monica, CA: Goodyear Publishing Company.

_____ & Snow, C.C. 1978. *Organizational strategy, structure, and process*. New York: McGraw-Hill Book Company.

_____, Snow, C.C., Meyer, A.D., & Coleman, H.J. 1978. Organizational strategy, structure, and process. *Academy of Management Review*, 3(3): 546-562.

Mintzberg, H. 1983. *Structure in fives: Designing effective organizations*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Moenaert, R.K. & Souder, W.E. 1990. An information transfer model for integrating marketing and R&D personnel in new product development projects. *The Journal of Product Innovation Management*, 7: 91-107.

Morgan, G. 1986. *Images of organizations*. Beverly Hills, CA: Sage Publications.

Morgan, R.M. & Hunt, S. 1993. Commitment and trust in relationship marketing. Working paper.

Norton, J., Parry, M.E., & Song, X.M. 1994. Integrating R&D and marketing: A comparison of practices in the Japanese and American chemical industries, *IEEE Transactions on Engineering Management*, 41(1): 5-20.

Nunnally, J.C. 1978. *Psychometric theory*. New York: Mc-Graw-Hill Publishing Company.

O'Guinn, T.C. & Faber, R.J. 1991. Mass communication and consumer behavior. In T.S. Robertson & H.H. Kassarjian (Eds.), *Handbook of consumer behavior*, Englewood Cliffs, NJ: Prentice-Hall.

Ohmae, K. 1988. Getting back to strategy. *Harvard Business Review*, 88: 149-156.

Parsons, T. 1960. *Structure and process in modern societies*. Glencoe, IL: The Free Press.

Pondy, L.R. 1967. Organizational conflict: Concepts and models. *Administrative Science Quarterly*, 12(2): 296-320.

Pondy, L.R. 1992. Reflections on organizational conflict. *Journal of Organizational Behavior*, 13: 257-261.

Porter, J.N. 1982. *Conflict and conflict resolution*. New York: Garland Publishing, Inc.

Prahalad, C.K. & Bettis, R.A. (1986). The dominant logic: A new linkage between diversity and performance. *Strategic Management Journal*, 7: 485-501.

Presthus, R. 1978. *The organizational society*. New York: St. Martin's.

Price, J.L. & Mueller, C.W. 1986. *Handbook of organizational measurement*. Lexington, MA: D.C. Heath.

Pruitt, D.G. & Rubin, J.Z. 1986. *Social conflict*. New York: Random House.

Quinn, J.B. 1979. Technological innovation, entrepreneurship, and strategy. *Sloan Management Review*, 21: 15-26.

Rahim, M.A. 1979. Managing conflict through effective organization design: An experimental study with the maps design technology. *Psychological Reports*, 44: 759-764.

_____ 1983. A measure of styles of handling interpersonal conflict, *Academy of Management Journal*, 26(2): 368-376.

_____ 1986. *Managing conflict in organizations*. New York: Praeger.

_____ & Bonoma, T.V. 1979. Managing organizational conflict: A model for diagnosis and intervention. *Psychological Reports*, 44: 1323-1344.

Rapoport, A. 1960. *Fights, games, and debates*. Ann Arbor, MI: University of Michigan.

Robbins, S.P. 1974. *Managing organizational conflict*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Rogers, E.M. 1983. *Diffusion of innovations*. New York: The Free Press.

Rothwell, R. 1974. The Hungarian Sappho: Some comments and comparisons. *Research Policy*, 3: 30-38.

Ruble, T. & Thomas, K. 1976. Support for a two-dimensional model of conflict behavior. *Organizational Behavior and Human Performance*, 16: 143-155.

Ruekert, R.W. & Walker, O.C. 1987a. Marketing's interaction with other functional units: A conceptual framework and empirical evidence. *Journal of Marketing*, 51(1): 1-19.

_____ & Walker, O.C. 1987b. Interactions between marketing and R&D departments in implementing different business strategies. *Strategic Management Journal*, 8(3): 233-248.

_____, Walker, O.C. & Roering, K.J. 1985. The organization of marketing activities: A contingency theory of structure and performance. *Journal of Marketing*, 49(1): 13-25.

Runyon, R.P. & Haber, A. 1988. *Fundamentals of behavioral statistics*. New York: Random House.

Schermerhorn, J.R. 1975. Determinants of interorganizational cooperation. *Academy of Management Journal*, 18(4): 846-856.

Schmidt, S. & Kochan, T. 1972. Conflict: Toward conceptual clarity. *Administrative Science Quarterly*, 17: 359-370.

Schumpeter, J.A. 1928. The instability of capitalism. *Economic Journal*, 38: 361-386.

Segev, E. 1980. A systematic comparative analysis and synthesis of two business-level strategic typologies. *Strategic Management Journal*, 10: 487-505.

Sheppard, B.H. 1984. Third party conflict intervention: A procedural framework. In B.M. Staw and M.A. Bazerman (Eds.) *Research on Negotiation in Organizations*, vol. 1, Stamford, CT: JAI: 311-321.

Sheth, J. 1993. Presentation at the American Marketing Association Doctoral Consortium in August 1993, Urbana-Champaign, University of Illinois.

Shortell, S.M. & Zajac, E.J. 1990. Perceptual and archival measures of Miles and Snow's strategic types: A comprehensive assessment of reliability and validity. *Academy of Management Journal*, 33(4): 817-832.

Simmel, G. 1955. *Conflict and the web of group-affiliations*. New York: The Free Press.

Skinner, W. 1987. The productivity paradox. In Corporate Leaders Forum (Eds.), *Strategy, Technology and American Industry*: 35-39. Boston: Harvard Business School Publishing Division.

Snow, C.C., & Hrebiniak, L.G. 1980. Strategy, distinctive competence, and organizational performance. *Administrative Science Quarterly*, 25: 317-336.

Sokal, R. & Sneath, P. 1963. *Principles of Numerical Taxonomy.* San Francisco: W.H. Freeman.

Song, X.M. & Parry, M.E. 1991. The impact of firm strategy, environmental uncertainty, and organizational structure and climate on R&D-marketing integration in Japanese high-technology firms, *PDMA Proceedings*: 49-59.

_____ & Parry, M.E. 1992. The R&D-marketing interface in Japanese high-technology firms, *Journal of Product Innovation Management*, 9: 91-112.

_____ & Parry, M.E. 1993. How the Japanese manage the R&D-marketing interface, *Research Technology Management*, July-August: 32-38.

_____ & Parry, M.E. 1993. R&D-marketing integration in Japanese high-tachnology firms: Hypotheses and empirical evidence, *Journal of the Academy of Marketing Science*, 21(2): 125-133.

Souder, W.E. 1975. Achieving organizational consensus with respect to R&D project selection criteria. *Management Science*, 21(6): 172-188.

_____ 1977. Effectiveness of nominal and interacting group decision processes for integrating R&D and marketing. *Management Science*, 23(6): 595-605.

_____ 1980. Promoting an effective R&D/marketing interface. *Research Management*, July: 10-15.

_____ 1981. Disharmony between R&D and marketing. *Industrial Marketing Management*, 10: 67-73.

_____ 1987. *Managing new product innovation*. Lexington, MA: Lexington Books.

_____ 1988. Managing relations between R&D and marketing in new product development project. *Journal of Product Innovation Management*, 5: 6-19.

_____ & Chakrabarti, A.K. 1978. The R&D/Marketing interface: Results from an empirical study of innovation projects. *IEEE Transaction on Engineering Management*, EM-25(4), 88-93.

Spector, P.E. 1992. *Summated rating scale construction*. Newbury Park: Sage Publications.

Sullivan, L.P. 1986. Quality function deployment. *Quality Progress*, 19(6): 39-50.

Takeuchi, H. & Nonaka, I. 1986. The new product development game. *Harvard Business Review*, Jan.-Feb.: 137-146.

Thomas, A.S., Litschert, R.J., & Ramaswamy, K. 1991. The performance impact of strategy-manager coalignment: An empirical examination. *Strategic Management Journal*, 12: 509-522.

Thomas, K. W. 1976. Conflict and conflict management. In M.D. Dunette (Ed.), *Handbook of industrial and organizational psychology*, Chicago: Rand-McNally: 889-935.

_____ & Kilmann, R.H. 1978. Comparison of four instruments measuring conflict behavior, *Psychological Reports*, 42: 1139-1145.

_____ & Kilmann, R.H. 1974. *Thomas-Kilmann conflict mode instrument*. Xicom, Inc., Tuxedo, NY.

Thompson, J.D. 1967. *Organizations in action*. New York: McGraw-Hill Book Company.

Thibaut, J. & Walker, L. 1975. *Procedural justice: A psychological analysis*. Hillsdale, NH: Erlbaum.

Tjosvold, D. 1989. Interdependence approach to conflict management in organizations. In A. Rahim (Ed.) *Managing conflict: An interdisciplinary approach*, New York: Praeger: 41-50.

Tjosvold, D. 1991. *The conflict-positive organization*. Reading, MA: Addison-Wesley.

Utterback, J.M. 1974. Innovation in industry and the diffusion of technology. *Science*, February: 620-626.

Venkatraman, N. & Grant, J.H. 1986. Construct measurement in organizational strategy research: A critique and proposal. *Academy of Management Review*, 11(1): 71-87.

Viswanathan, M. & Olson, E.M. 1992. The implementation of business strategies: Implications for the sales function. *Journal of Personal Selling & Sales Management*, 12(1): 45-57.

Walker, O.C. & Ruekert, R.W. 1987. Marketing's role in the implementation of business strategies: A critical review and conceptual framework. *Journal of Marketing*, 51: 15-33.

Walton, R. 1969. *Interpersonal peacemaking*. Reading, MA: Addison Wesley.

_____ & Dutton, J.M. 1969. The management of interdepartmental conflict: A model and review. *Administrative Science Quarterly*, 14(1): 73-90.

_____, Dutton, J.M. & Cafferty, T.P. 1969. Organizational context and interdepartmental conflict. *Administrative Science Quarterly*, 14(4): 522-542.

Webster, F. E. 1992. *Industrial marketing strategy*. New York: John Wiley & Sons.

Weick, K.E. 1969. *The social psychology organizing*. Reading, MA: Addison-Wesley.

Wind, Y. 1973. A new procedure for concept evaluation. *Journal of Marketing*, 37: 2-11.

_____ 1981. Marketing and the other business functions. In Sheth, J.N. (ed.), *Research in Marketing*, 5: 237-264.

Zahra, S.A. & Pearce, J.A. 1990. Research evidence on the Miles-Snow typology. *Journal of Management*, 16(4): 751-768.

# APPENDIX 1

# Survey

## *THE UNIVERSITY OF TENNESSEE*
## *A SURVEY OF R&D/MARKETING RELATIONS*

*The purpose of this survey is to learn more about disagreements between functional areas in high technology firms. Specifically, we are interested in your perceptions of disagreements between R&D and Marketing in the new product development process. Such disagreements often entail feelings and information that are sensitive. We assure you that only the researchers at The University of Tennessee will view the information you have provided. Every aspect of this survey is* ***TOTALLY CONFIDENTIAL****. If you have any questions, please contact the researchers at (615) 974 - 5311 (office)or (615) 974 - 1932 (fax).*

Your candid responses to this survey are GREATLY APPRECIATED !

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# INTRODUCTION

**Background:**

Conflict management is a critical part of the problem-solving approach being adopted by today's progressive learning organizations. When well managed, differences between people and differences between functional areas, provide a creative engine to generate new products, new markets, better quality, better communications, and better processes. When poorly managed these differences can result in loss of time and productivity--losses that can seriously damage the competitive advantage of a firm.

**Project Objectives:**

1. To provide participants with insights on conflict behavior supporting effective new product development.
2. To provide participants with insights on structural conflict managing mechanisms supporting effective new product development.
3. To identify links between new product strategy and effective conflict management.

**Respondents Desired:**

People who work together in the R&D and Marketing departments on new product decisions. By R&D, we mean all people involved in technological product development activities. By Marketing, we mean all people involved in commercial activities such as marketing research, market planning, sales, product management, and so forth. This questionnaire will take about 25 minutes to fill out.

**Confidentiality:**

All questions on this questionnaire deal with the respondent's *subjective judgment.* All data, companies, and respondents are assigned a code known only by the researchers. This means that responses are NEVER communicated to the respondent's colleagues, subordinates, or superiors. We promise complete anonymity and confidentiality. Data will be analyzed only at the aggregate level. No individual responses will be released or disclosed. No one except the principal academic researchers will have access to the raw data.

**Benefits to the Respondents:**

For participating you will receive: 1) a private copy of the executive summary of the study results, which presents findings and their implications for effective conflict management in the R&D/Marketing interface; and 2) a copy of pre-publication articles. Please answer all questions. However, if you have difficulty answering some specific questions for any reason, please try to give your best judgment and move on to the next question. If possible, please return the completed questionnaire in the envelope provided at your earliest convenience along with a copy of your business card so that we can send you a private copy of our research report.

**THANK YOU VERY MUCH FOR YOUR COOPERATION!**

Please indicate below the primary business of your company in the electronic industry.

- ☐ Electric Transmission/Distribution Equipment
- ☐ Electric Lighting/Wiring Equipment
- ☐ Household Audio/Video Equipment/Recordings
- ☐ Electronic Components/Accessories
- ☐ Industrial/Commercial Machinery and Computer Equipment
- ☐ Electrical Industrial Apparatus
- ☐ Household Appliances
- ☐ Instrumentation
- ☐ Telecommunications Equipment
- ☐ Miscellaneous Machinery/Equip./Supplies (batteries, recording media, etc.)

## *R & D / MARKETING CONFLICT*
## *SECTION A: Functional Associations*

1. Which of the following functional areas do you represent? (please check one box)

   ❒ Research & Development (R&D) ❒ Marketing

2. Have you ever been involved with people in the other department making new product decisions?

   ❒ **NO.** Could you please pass this questionnaire on to a colleague in your department who has? Thank you.

   ❒ **YES.** Please go on. Many thanks in advance!

## *SECTION B : Conflict Levels*

Disagreement can occur between individuals and/or groups. We are interested in your perceptions of conflict arising from group membership within your firm. This can mean pleasant exchanges of differing points of view or hostile confrontations. For your firm, please think about the conflict that currently exists between R&D and Marketing. Then indicate the extent to which you disagree or agree with the following statements.

| **WHEN R&D AND MARKETING WORK TOGETHER..** | **Strongly Disagree** | **Moderately Disagree** | **Slightly Disagree** | **Neutral** | **Slightly Agree** | **Moderately Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| 1. Employees from the two departments share the same values. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. There is little or no interdepartmental conflict. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The objectives pursued by the Marketing department are incompatible with those of the R&D department. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. People conflict on how to proceed on tasks | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. People in the two areas rate the importance of decisions in the same way. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. We get along well with each other. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. People differ on the basic goals the two areas should pursue. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. People differ on the best way to accomplish new product goals | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. People in one department generally dislike interacting with those from the other department. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Employees agree on which tasks are urgent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Employees from the two departments feel that the goals of their respective departments are in harmony with each other. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. People conflict over how they should carry out their work | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## *SECTION C: Key Conflict Causes*

There may be many causes of disagreements between areas in organizations. We are interested in your perceptions of the major **causes** of conflict between R&D and Marketing in your firm. Please consider the following possible causes of conflict between the two functional areas and indicate the extent to which you disagree or agree with each statement.

| **A MAJOR CAUSE OF CONFLICT BETWEEN R&D AND MARKETING IS...** | **Strongly Disagree** | **Moderately Disagree** | **Slightly Disagree** | **Neutral** | **Slightly Agree** | **Moderately Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| 1. Communication problems | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Lack of interaction through formal channels | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Lack of interaction through informal channels | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Lack of respect | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Different product goals | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Different methods of achieving product goals | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Status differences | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Power struggles | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Different values | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Different time orientations (short or long term) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Different educational backgrounds | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Different business backgrounds | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. Competition for resources | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. Lack of trust of the other functional area | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Lack of trust of top management | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Confusion over roles | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Confusion over authority in joint projects | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Unfair handling of company procedures | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Differences in rewards and compensation | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Differences in recognition | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Different performance criteria | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. Infrequent information exchange | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

(continued on the next page)

| A MAJOR CAUSE OF CONFLICT BETWEEN R&D AND MARKETING IS... | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 23. Use of impersonal communications channels | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. Use of abusive language | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. Different language (technical jargon, etc.) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. Transfer of incomplete information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. Transfer of untimely information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. Transfer of inaccurate information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. Transfer of biased information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. Transfer of irrelevant information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. Transfer of information lacking context | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. Transfer of unsynthesized information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. Transfer of unclear information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. Transfer of unfamiliar information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## *SECTION D: Behavior During Disagreements*

We are interested in your perceptions of behavior during conflicts. The following statements describe how R&D and Marketing may behave <u>in general</u> during conflicts or disagreements between the two areas. To what extent do you disagree or agree with the behaviors described in each of the following statements?

| WHEN CONFLICTS ARISE BETWEEN R&D AND MARKETING, GENERALLY WE... | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. Try to bring all issues into the open in order to resolve them in the best way. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Stick to initial positions to get each other to compromise. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Encourage others to express their feelings and views fully. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Stress the importance of "give and take." | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Try to keep differences of opinion quiet. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Try to investigate an issue in order to find a solution agreeable to us both. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Avoid openly discussing disputed issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

(continued on the next page)

| WHEN CONFLICTS ARISE BETWEEN R&D AND MARKETING, GENERALLY WE... | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 8. Try to put a single area's needs first. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Tenaciously argue the merit of initial positions when disagreements occur. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Work hard to thoroughly, jointly learn about the issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Want the other to make concessions, but don't want to make concessions ourselves. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Look for middle ground to resolve disagreements. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. Try not to get mixed up in conflicts. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. Do all we can do to achieve harmony. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Try to keep anger and frustration from being expressed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Try to present a single position as only one of many possible points of view. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Negotiate to achieve goals. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Believe it is better to keep feelings to ourselves rather than create hard feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Go along with the suggestions of others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Look for faults in each other's initial positions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Smooth over conflicts by trying to ignore them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. Exchange complete and accurate information in order to help solve problems. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. Arrive at compromises that both areas can accept. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. Treat issues in conflict as a win-lose contest. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. Look for ways to bypass unpleasant exchanges. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. Try to satisfy the expectations of others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. Enjoy winning an argument. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. Openly share concerns and issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. Propose compromises in order to end deadlocks. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

(continued on the next page)

| WHEN CONFLICTS ARISE BETWEEN R&D AND MARKETING, GENERALLY WE... | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 30. Overstate needs and positions in order to get our ways. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. Avoid being "put on the spot" by keeping conflict to ourselves. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. Try to help others not "lose face" when there is a disagreement. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. Are firm in pursuing one side of an issue. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. Go the "extra mile" to get along with each other. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. Try to stay away from disagreements. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36. Try to meet each others' schedules whenever we can. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## *SECTION E: Causes And Behavior*

Conflict behavior may change based on the context of a disagreement. We would like to know your perceptions of **general** behavior patterns between R&D and Marketing in different conflict circumstances. Please indicate the extent to which you disagree or agree with the following statements by circling a number between 1 and 7 in the **two** columns to the right of each statement given below, where:

**1=Strongly Disagree 2=Moderately Disagree 3=Slightly Disagree 4=Neutral 5=Slightly Agree 6=Moderately Agree 7=Strongly Agree**

| WHEN R&D/MARKETING CONFLICT IS GENERATED BY... | We Avoid Solving the Conflict. | | | | | | | We Force Through Solutions. | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Communication problems | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Lack of respect | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Different product goals | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Different methods of achieving product goals | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Status differences | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Power struggles | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Different values | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Different time orientations (short or long term) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Different educational backgrounds | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Different business backgrounds | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

(continued on the next page)

1=Strongly Disagree 2=Moderately Disagree 3=Slightly Disagree 4=Neutral 5=Slightly Agree 6=Moderately Agree 7=Strongly Agree

| WHEN R&D/MARKETING CONFLICT IS GENERATED BY... | We Avoid Solving the Conflict. | We Force Through Solutions. |
|---|---|---|
| 11. Competition for resources | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 12. Lack of trust of the other functional area | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 13. Lack of trust of top management | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 14. Confusion over roles | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 15. Confusion over authority in joint projects | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 16. Unfair handling of company procedures | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 17. Differences in rewards and compensation | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 18. Differences in recognition | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 19. Different performance criteria | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 20. Infrequent information exchange | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 21. Impersonal communications channels | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 22. Use of abusive language | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 23. Different language (jargon). | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 24. Transfer of incomplete information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 25. Transfer of untimely information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 26. Transfer of inaccurate information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 27. Transfer of biased information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 28. Transfer of irrelevant information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 29. Transfer of information lacking context | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 30. Transfer of unsynthesized information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 31. Transfer of unclear information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |
| 32. Transfer of unfamiliar information | 1 2 3 4 5 6 7 | 1 2 3 4 5 6 7 |

## *SECTION F : Conflict Outcomes*

Conflicts generate outcomes. We are interested in your perceptions of conflict results when R&D and Marketing work together on new product decisions. Please indicate the extent to which you disagree or agree with the following statements.

| **WHEN R&D AND MARKETING WORK TOGETHER WE GENERALLY...** | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. Work harder because of the conflicts that we have. .. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. See constructive changes occur on projects because of conflicts. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Know each other better because of the way conflicts are handled. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Are more sensitive to one another because of the way conflicts are handled. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Feel energized and ready to get down to work after a conflict. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Feel hostile toward each other after a conflict. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## *SECTION G : Crossfunctional Success*

We are interested in your perceptions of successful new product development relationships. Please rate the overall success of the relationship between R&D and Marketing in developing new products by indicating to what extent you disagree or agree with each of the following statements.

| **IN GENERAL...** | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. We feel very satisfied in our work with each other. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. We feel a strong commitment to working with the each other on new product development. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. We have a high degree of trust in the each other. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The way we work together inspires all of us to better job performance. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. We feel highly committed to joint work with the each other on new product development. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. All things considered, we feel highly pleased with the way in which we work together on new product development. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The way we work together makes us think seriously about quitting new product projects. ... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## *SECTION H : New Product Success*

We are interested in your perceptions of successful new product outcomes. Please rate the **overall** success of your company's new product development program by indicating to what extent you disagree or agree with each of the following statements.

| | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. Overall, our company is one of the most successful companies in the industry. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Our overall performance of our new product program has met our objectives. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. From an overall profitability standpoint, our new product development program has been successful. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Compared to major competitors, our overall new product program is far more successful. .... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Compared to our major competitors, our new product development cycle time has been relatively less. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Our product-line breadths are much broader than those of our competitors. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The overall quality of our new products is higher than that of our competitors. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. The overall price of our new products is higher than that of our competitors. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. The timing of our product introductions is good. . | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Our company has relatively high market shares. . | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Our new product development costs generally stay within our budgeted costs. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## *SECTION I : Company Structure*

We want to know your perceptions of firm structure. To what extent do you disagree or agree with the following statements?

| | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. Written procedures and guidelines are available for most work situations. ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Any decision I make has to have my boss' approval. . | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

(continued on the next page)

| | | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|---|
| 3. | Formal communication channels have been established. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | There can be little action taken here until a supervisor approves a decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Written documents, such as budgets, plans, and schedules, are an integral part of the job. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Even small matters have to be referred to someone higher up for a final answer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | Performance appraisals in our organization are based on written performance standards. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | A person who wants to make his own decision would be quickly discouraged here. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | Duties, authority, and accountability of personnel are documented in policies, procedures, or job descriptions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | I have to ask my boss before I do almost anything. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## *SECTION J: Firm Strategy*

We are interested in your perceptions of your division or company's strategy as a **WHOLE**--not individual new product efforts. Note that each strategic type described below is a legitimate strategy. None is inherently "good" or "bad."

1. Please check the **one** type below that most closely fits your organization.

❒ Type 1 — This type of company locates and maintains a 'niche' in a relatively stable product area. Generally this company is not at the forefront of new product or market development, but concentrates instead on a limited range of products--doing the best job possible through quality, superior service, low prices, and so forth.

❒ Type 2 — This type of company makes relatively frequent changes in, and additions to, its range of products. By responding rapidly to early signals of market needs or opportunities, this company tries to be 'first in' in new product and market areas--although it may not maintain market strength in all of the areas it enters.

❒ Type 3 — This type of company maintains a stable, limited line of products and simultaneously moves to follow a selected, promising set of new product developments in other areas. This company is seldom 'first in' with new products, but instead may be 'second in' with a more cost effective or better conceived product.

❒ Type 4 — This type of company does not appear to have a consistent product-market orientation. Unlike competitors, it is not aggressive in maintaining established products and markets, nor is it willing to take many risks. This company changes its product offering when and where it is forced to by environmental pressures.

## *Section K : Firm Strategy*

We are interested in perceptions of firm strategy. The following statements describe how a firm might strategically approach new product development. To what extent do you disagree or agree with the following statements in reference to your firm?

| | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neutral | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. In comparison to our competitors, the products we provide our customers are more innovative, and continually changing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. In contrast to our competitors, my organization has an image in the marketplace as a firm that has a reputation for being innovative and creative. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. My firm spends significant amounts of time continuously monitoring the marketplace for changes and trends. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. In comparison to our competitors, the increases or losses in demand which we have experienced are due most probably to our practice of aggressively entering new markets with new types of products. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. One of this firm's key goals relative to its competitors is availability and accessibility of the people, resources, and equipment required to develop new products and markets. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. In contrast to our competitors, our managerial employees exhibit competencies (skills) that are broad, entrepreneurial, diverse, and flexible--enabling change to be created. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The one thing that protects my organization from its competitors is that we are able to consistently develop new products and new markets. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Our management staff concentrates on developing new products, new markets and new market segments more than many of our competitors. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. In contrast to many competitors, my organization identifies marketplace trends and opportunities that can result in product offerings new to the industry or able to reach new markets. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. In comparison to our competitors, the structure of my organization is product or market oriented. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Unlike our competitors, our company procedures to evaluate performance are decentralized and participatory, encouraging many company members to be involved. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**THANK YOU FOR HELPING US COMPLETE THIS STUDY!**

# APPENDIX 2

# Cover Letter

October 5, 1994

Dear Marketing Director:

Research shows many new product development projects suffer significant productivity losses due to conflicts between their marketing and engineering areas. In response to this, The University of Tennessee is conducting an industry-academic joint research project to study the impact of conflict behaviors in the new product development process. This award-winning study at The University of Tennessee will seek to provide insights on: 1) conflict *behaviors* that support effective new product development; 2) *structural mechanisms* for conflict management that support effective new product development, and 3) linkages between new product strategy and effective conflict management.

Based on our background research, I believe (your company) can make a significant contribution to the study, and I would like to ask your participation. In return, I will provide you a *private copy* of the executive summary of our study results. These results will be based on responses from hundreds of manufacturing firms in the electronics industry and will have immediate relevancy for your company. The executive summary will include managerial implications and recommendations that may be useful for setting new product development policy and improving the new product development process in your company. You will also receive a copy of *pre-publication* articles. Today, many Fortune 500 companies are commissioning conflict studies just such as this one to improve problem-solving skills and increase their competitive advantage in new product development.

To successfully carry out our study, I need your firm's help in completing the enclosed questionnaires. In particular, I ask that a marketing manager of your firm complete one questionnaire and an R&D/engineering manager complete the other. I need your help to forward the enclosed questionnaire(s) to a manager(s) either responsible for or familiar with your company's new product development and/or commercialization activities. The questionnaire takes only 25 minutes to complete and asks solely for the manager's subjective judgment--no specific financial data or proprietary information of any kind is requested. All information is strictly confidential. Collected data will be used only in the aggregate. The company name, the names of individuals, and individual responses will not be released or disclosed.

I sincerely hope that you will join me in working to improve new product development. Please feel free to contact us at the above address if you have any questions about the study or if I can be of any service to your company. Thank you very much in advance.

Most Respectfully Yours,

Barbara Dyer
Principal Researcher

# APPENDIX 3

# First Follow-up Letter

October 21, 1994

Dear Marketing Director:

One week ago two questionnaires were mailed to (your company) requesting your support of an award-winning study looking at new product development collaboration between marketing and R&D/engineering. The study seeks to help managers better understand the impact of conflict behaviors on successful new product development. Many corporations are commissioning similar studies to help improve innovation efforts and increase competitive advantage.

If you and the other requested participant from your company have already completed and returned the questionnaires, please accept my sincere thanks for your support of my doctoral research. If not, please do so today. I would be most grateful. Both of your responses are extremely important in securing a representative sample for analysis--which, of course, also maximizes the benefits you and your company gain from the private executive summary you receive for participating.

If by some chance you did not receive the questionnaire, or it was misplaced, please call me collect right now (615-675-4849). I will gladly send you another one immediately. Again, thank you for your consideration.

Most Sincerely Yours,

Barbara Dyer
Principal Researcher, Ph.D. Candidate

# APPENDIX 4

## Second Follow-up Letter

November 4, 1994

Dear Marketing Director:

Two weeks ago I mailed (your company)a followup letter to my original October 14 mailing regarding your support of an award-winning study looking at new product development collaboration between marketing and R&D/engineering. I have still not received both of your completed questionnaires. (If the marketing and R&D/engineering participants have already mailed their completed questionnaires, I thank you sincerely and request that you ignore the remainder of this letter.)

In case the two participants from your company have misplaced or did not receive the original surveys, I am enclosing another two copies and two addressed return envelopes for your convenience. If you could complete the enclosed questionnaires as soon as possible, I would be most grateful.

Please remember, if you are interested in a private copy of the Executive Summary of the study report, to enclose your business card with your completed questionnaire. I believe that the study results could be of significant use to you and your organization in managing your new product development process.

Also, if you have any remaining questions about the study or the questionnaire, I would be pleased to discuss them with you. You may reach me at (615) 675 4849 or (615) 974 5311. Your cooperation is greatly appreciated.

Most Sincerely Yours,

Barbara Dyer
Principal Researcher, Ph.D. Candidate

P.S.
Many companies have asked when the Executive Summary will be available. The target date for mailing these out to participants in the study will be January 1995.

# APPENDIX 5

# Third Follow-up Letter

November 21, 1994

Dear Marketing Director:

About four weeks ago I first contacted (your company) requesting your participation in a study of new product development collaboration between marketing and R&D/engineering. I have not yet received your two completed questionnaires.

Although I am very encouraged that more than 100 companies have already chosen to participate in this study, I must reemphasize that the quality of the study results depends upon you and the others who have not yet fully responded. Your opinions are very important to ensure excellent results--from both an analysis and representation standpoint.

This study hopes to generate solutions to conflict problems in the new product development process--not just more questions. Richard Pascale, a nationally known management consultant, in *Managing on the Edge: How the Smartest Companies Use Conflict to Stay Ahead*, asserts that organizational conflict behaviors affect the firm's ability to adapt and to survive. Having worked in industry myself and having studied conflict issues at a graduate level, I agree. So how does a firm go about managing conflict for firm success? This study seeks to provide empirically-based, practical recommendations that may help establish new product development policy appropriate for today's dynamic business environment.

In closing, I want to thank you for your time--which I *do* understand is precious. I believe, however, that your firm's participation can result in meaningful information and recommendations that may substantially improve its new product development efforts. If I can answer any questions, you may reach me at (615) 675 4849 or (615) 974 5311.

Most Sincerely Yours,

Barbara Dyer
Principal Researcher, Ph.D. Candidate

# APPENDIX 6

## Data Analysis Steps

| | Analysis | Purpose |
|---|---|---|
| 1. | Cronbach's alpha, factor analysis | To assess the inter-item reliability of scales for initial construct development and validity of scales. |
| 2. | Data preparation using univariate descriptive analysis | Prepare data for subsequent analysis |
| 3. | T-tests, 1st wave and 2nd wave | To assess nonresponse bias |
| 4. | Correlation matrix of constructs using Pearson product-moment coefficient | To check validity of constructs |
| 5. | Cook's D; Belsley, Kuh, and Welsch | To check for outliers, observation influence, and multicollinearity |
| 6. | Split data into three samples: combined R&D, and Marketing | Prepare data set for comparison |
| 7. | Cronbach's alpha | To assess inter-item reliability of final constructs across the three samples |
| 8. | Performed factor analysis on combined, R&D, and Marketing samples | Validate measurement scales for final constructs across the three samples |
| 9. | Performed cluster analysis | Assign responses to strategic groups |
| 10. | Performed ANOVA on all 11 strategy measures | Check strategic assignment to groups to ensure differences between the two groups |
| 11. | Estimated model using 2-stage regression | To assess hypothetical model |
| 12. | Hypothesis testing using ANOVA, MANOVA, repeated measures MANOVA, correlation, t-tests, quadratic regression test | To test hypotheses |

# VITA

Barbara Jones Dyer was born in St. Joseph, Missouri, October 9, 1948. Her family moved to North Carolina in 1953, and she attended elementary school in Davidson, N.C. Her family moved again in 1959, and she attended junior high and high school in Greensboro, N.C., graduating from Grimsley Senior High (formerly Greensboro Senior High) in June, 1966. From 1966 to 1968 she attended Woman's College of North Carolina (now the University of North Carolina at Greensboro). From 1968 until 1980 she worked in the home, as well as in retail management. During this period she lived a total of four years abroad, two years in Japan and two years in Panama. In August of 1980 she reentered the University of North Carolina at Greensboro and graduated with a Bachelor of Science in Retailing in August, 1982 and a Master of Science in Retailing in May, 1985. From 1985 until 1989 she worked in retail management for Allied Corporation and Crown Royal. In August, 1989, she entered The University of Tennessee, Knoxville, and in May, 1995, received a Doctor of Philosophy in Business Administration in Marketing and Strategic Management.

Barbara is currently an Assistant Professor and Scott Fetzer Faculty Fellow in the Marketing Department at Ohio University in Athens, Ohio.