

Winter 1999

First Mover Advantage: An Industrial Buyer Behavioral Perspective

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**FIRST MOVER ADVANTAGE:
AN INDUSTRIAL BUYER BEHAVIORAL PERSPECTIVE**

by

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**A Dissertation submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of**

DOCTOR OF PHILOSOPHY

MARKETING, EMPHASIS IN INTERNATIONAL BUSINESS

**OLD DOMINION UNIVERSITY
December 1999**

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ABSTRACT

FIRST MOVER ADVANTAGE: AN INDUSTRIAL BUYER BEHAVIORAL PERSPECTIVE

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Old Dominion University, 1999
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Contemporary order-of-entry research has shifted from econometric investigations to research grounded in quasi-experimental and empirical consumer behavior studies. In the marketing literature, Carpenter and Nakamoto (1988), Kardes and Kalyanaram (1992), and particularly Alpert and Kamins (1992, 1994, 1995) have examined the role of consumer behavior as a potential explanation of first mover advantage. However, little or no research has been devoted to an understanding of pioneer advantage as it relates to industrial markets.

This dissertation investigated the effect of order of entry on the attitudes of industrial purchasing managers. Six major hypotheses were proposed to examine the cognitive beliefs, attitudes, and purchasing intentions of industrial purchasing managers as they relate to order of entry. Specifically, this line of inquiry examined the global and multiattribute attitudes of industrial purchasing managers toward three categories of entry: pioneers, early followers, and late entrants. In addition, the research strategy of this study included a measure of global attitudinal preference under *ceteris paribus* conditions. The research setting for this study consisted of National Association of Purchasing Management members representing strategic business units from Standard Industrial Classifications 35, 36, 37, and 38. The results of this study were based upon a

multivariate statistical analysis of the survey responses of 231 industrial purchasing managers. The findings of this study strongly suggest that industrial purchasing managers hold different attitudes toward potential suppliers based upon their entry order. In contrast to previous research in consumer goods settings, industrial purchasing managers were found to extend an attitudinal preference to early followers over pioneers. This attitudinal preference was substantial, statistically significant, and consistent. Survey respondents were also found to associate different subjective attributes with different order-of-entry categories, creating potential trade-offs in the purchasing decision. Pioneer suppliers were perceived to be more technologically sophisticated and more likely to enhance the competitive advantage of the purchasing firm's products. However, survey respondents expressed concerns regarding pioneer quality, reliability, and expense - all factors associated with perceived risk. When these concerns were mitigated, industrial purchasing managers were found to prefer pioneer products.

ACKNOWLEDGEMENTS

There are many individuals and organizations who have contributed to the completion of this dissertation. I extend many thanks to the members of my committee including Dr. John B. Ford, Dr. Earl D. Honeycutt, Jr., and Dr. Edward P. Markowski for their patience and encouragement in this process. I am also grateful to Gettysburg College and the National Association of Purchasing Management, whose logistical assistance was critical to the completion of this study. Finally I would like to recognize my friends and family, without whose understanding and support, this project may never have been realized.

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CHAPTER I

INTRODUCTION

First mover advantage (FMA) represents the strategic concept that initial market entrants are able to leverage the simple fact of being first into long-term competitive advantage. Both marketers and academics have perceived first mover advantage as a major explanation of long-term business success, and this pattern of superior performance can be traced over the course of many decades. In an often-cited study (*Advertising Age* 1983) comparing the market share performance of the leaders in 25 product categories from 1923 to 1983, fully 19 brands maintained their market share leadership over the course of the six decades while the others continued to hold important market share. The longevity of this superior market performance speaks to the power of first mover advantage, but, if this is so, how does one explain the poor performance of the following pioneers: Kirsch's in diet soft drinks, DeLaRue in ATMs, Bowmar in pocket calculators, VisiCalc in spreadsheets, and Code-A-Phone in answering machines (Schnaars 1994)? Largely forgotten today, each was a first mover in its respective product category. However, all were rapidly driven from market pre-eminence despite their initial order-of-entry advantage. First mover advantage is a complex market phenomenon with strong conceptual underpinnings and a persuasive amount of supporting empirical evidence (Robinson and Fornell 1985; Robinson 1988). However, its critics have raised a number of issues regarding the limitations and, indeed, the validity of the concept, as has been partially illustrated with the preceding illustrations of first mover *disadvantage*. Recently however, contemporary approaches to first mover advantage (Kerin, Varadarajan, and Peterson 1992) have

reconciled the internal tension between these two perspectives through a contingency framework which recognizes the multidimensional nature of order of entry upon competitive advantage.

The first mover hypothesis states that, on average, order of entry is negatively correlated with long-term market performance (Robinson, Kalyanaram, and Peterson 1994). That is, *ceteris paribus*, the earlier the entry within a market, the greater the eventual market share. The counter-intuitive nature of the correlation arises from the expected negative sign of the order-of-entry coefficient in the econometric model traditionally used in modeling first mover advantage. The research stream has adopted this terminology and it is universally employed (Kerin, Varadarajan, and Peterson 1992).

First mover, or pioneer advantage (the terms are used synonymously), has increasingly become accepted within the marketing strategy research community as an empirical generalization (Kalyanaram, Robinson, and Urban 1995). A compelling factor behind this growing acceptance of the role which order of entry plays in the development of competitive advantage is the emergence of a theoretical framework which seeks to explain *why* first movers enjoy long-term market share performance.

Order-of-entry research has traditionally looked to the economic barriers-to-entry literature (Bain 1956; Porter 1980) as a conceptual basis for first mover advantage. Within this research literature, both supply and demand factors are reflected. Among the supply side barriers to entry are economy-of-scale effects, experience effects, the role of patents, and the pre-emption of strategic inputs and distribution channels (Lieberman and Montgomery 1988). On the other hand, demand side barriers to entry are reflected in the differential marginal efficiency of advertising (Comanor and Wilson 1967), the

reputational effects of the pioneer, and buyer switching costs (Porter 1985). While the economic barriers-to-entry literature offers an impressive theoretical basis for first mover advantage, its conceptual robustness has been significantly reinforced with the development of a behavioral framework (Alpert and Kamins 1994) which interprets pioneer advantage, at least partially, as a function of the psychological processes of consumers. Although this behavioral perspective largely originated in the consumer economics literature with Schmalensee's (1982) work in risk aversion, recent studies in marketing have made a significant contribution to this research stream. Among these behavioral insights into pioneer advantage are the role of learning and memory (Kardes and Kalyanaram 1992), brand retrieval and consideration set advantages (Kardes, Kalyanaram, Chandrashekar, and Dornoff 1993), as well as prototypicality and attribute preference formation (Carpenter and Nakamoto 1989). In addition, empirical studies of consumer and reseller buyer attitudes and beliefs towards pioneering brands have served to reinforce the theoretical basis of first mover advantage (Alpert, Kamins, and Graham 1992; Alpert and Kamins 1995). Consequently, a behavioral basis for first mover advantage within consumer markets can be supported through theoretical arguments, experimental evidence, and empirical results.

The present dissertation attempts to contribute to this literature by extending the research domain to industrial markets. Five related premises form the cornerstone of this dissertation:

1. **The first mover hypothesis that order of entry is negatively related to long-term market performance has increasingly become accepted as an empirical generalization. Twenty years of industry-specific as well as cross-sectional research employing different methodologies has consistently shown that, on average, first movers enjoy superior long-term market performance as compared with later entrants (Bond and Lean 1977; Robinson and Fornell 1985; Kalyanaram and Urban 1992).**
2. **Despite this body of empirical evidence, a contrarian perspective exists which has compiled a series of criticisms of and limitations to the first mover hypothesis (Schnaars 1994; Golder and Tellis 1993).**
3. **Contemporary appraisals of the first mover advantage issue have recognized other dimensions of competitive advantage as influential in long-term market performance, resolving much of the controversy in a contingency framework (Kerin, Varadarajan, and Peterson 1992; Syzmanski, Troy, and Bharadwaj 1995).**
4. **While the theoretical basis for first mover advantage has traditionally been found in the barriers-to-entry literature, recent developments in marketing scholarship have shown that psychological processes may represent a robust source of conceptual explanation (Carpenter and Nakamoto 1989; Kardes, Kalyanaram, Chandrashekar, and Dornoff 1993).**
5. **Organizational buying behavior stems from both economic-analytical as well as psychological sources (Sheth 1973; Engel, Blackwell, and Miniard 1995) and represents a distinct research domain from consumer behavior (Sheth 1996; Kotler 1997).**

In this chapter the topic of first mover advantage is introduced and the stage is set for subsequent investigation. Following the initial remarks of the introduction section is a description of the problem which this research study confronts. In this statement of the problem, the research focus is articulated and the theoretical issues surrounding a behavioral interpretation of first mover advantage are presented. This discussion culminates with the uncovering of the gap in the research literature which is to be the focus of this dissertation. Following this depiction of the research problem is a section in

which the vocabulary of this research study is defined for the reader. After this definition of terms, the parameters of this research study are established. A detailed statement of justification for the research is then presented. Justification for the study is unfolded in terms of its potential contribution to marketing theory as well as marketing practice. Finally, the framework of the dissertation is presented.

Statement of the Problem

As has been noted, empirical studies of consumer products reseller buyers (Alpert, Kamins, and Graham 1992) and consumers (Alpert and Kamins 1995) have uncovered statistically significant differences in attitude based upon order of entry. Researchers within the order-of-entry research community have noted the conspicuous absence of knowledge regarding the role of organizational buying behavior in the formation of first mover advantage and called for further research (Kalyanaram, Robinson, and Urban 1995). The goal of this dissertation is to fill this research gap.

An extensive literature has developed over the past three decades which has attempted to distinguish between consumer and industrial markets. Although acceptance of this dichotomy is not universal (Fern and Brown 1984), the marketing research community has generally accepted the distinctiveness of organizational buying behavior as a research domain as is evidenced by the editorial policy of academic journals (Sheth 1996) and widely-disseminated marketing texts (Kotler 1997). In summarizing this perspective, Kotler (1997) identified the following distinctive characteristics of industrial markets (p. 205 - 206):

1. **Business markets are characterized by high buyer concentration ratios.**
2. **Close buyer-seller relationships are common in industrial markets and may involve elements of reciprocity.**
3. **Industrial markets are geographically concentrated.**
4. **Industrial markets are characterized by derived demand which is relatively inelastic.**
5. **Demand conditions in industrial markets are relatively volatile.**
6. **Industrial marketing channels are often direct in nature.**
7. **Organizational buying behavior may be characterized by its professionalism and the participation of multiple influences.**

There are two generally-accepted theoretical models of organizational buying behavior. The first of these is the 1972 Webster and Wind model (cf. Appendix: Figure II) while the second is the 1973 Sheth model (cf. Appendix: Figure III). Both models recognize a multitude of determinant influences upon buying behavior including environmental determinants, organizational determinants, interpersonal determinants, firm-specific and product-specific factors. Highly significant for the purposes of this study is the recognition that all models accord a role for the determinant influence of the individual purchasing manager. The intent of this dissertation research is to examine the behavioral underpinnings of pioneer advantage in the context of industrial markets. Specifically, this dissertation will examine the global and multiattribute attitudes of industrial purchasing managers toward order of entry. Following the example set by Alpert and Kamins (1992) in their study of grocery store buyers, the Fishbein and Ajzen (1975) model will serve as the foundation of this study. Through the use of Fishbein and Ajzen's (1975) multiattribute attitude model, this dissertation will attempt to demonstrate

whether and how order of brand entry affects the attitudes of industrial purchasing managers. Attitude has been defined by Fishbein and Ajzen (1975) as “a learned predisposition to respond in a consistently favorable or unfavorable manner in respect to a given object” (p. 6). Furthermore, these researchers have postulated that the direction and magnitude of these attitudes is formed as the sum of the evaluation of relevant attributes multiplied by the likelihood of their occurrence. The classic portrayal of this relationship within the marketing literature was suggested by Bass and Talarzyk (1972) and takes the following form:

$$A_b = \sum_{i=1}^N W_i B_{ib}$$

where: A_b = the attitude toward a particular brand b
 W_i = the weight or importance of attribute i
 B_{ib} = the evaluative aspect or belief toward attribute i for brand b
 N = the number of attributes important in the selection of a given brand in the given product category

According to contemporary conceptualizations of attitude as described by Engel, Blackwell, and Miniard (1995), beliefs and feelings are hypothesized to be precursors of attitudes, and attitudes are hypothesized to be precursors of behavioral intentions. Both the cognitive as well as the affective components are understood to be determinants of attitudes (cf. Appendix: Figure V). Thus, an examination of the beliefs and values of industrial purchasing managers regarding order of entry may illuminate the issue of industrial purchasing managers' attitudes towards pioneering. Consequently, the

multiattribute attitude model may offer insight into the development of first mover advantage in an industrial marketing setting.

This study calls for the use of a survey methodology in the context of materials and components purchased by manufacturing firms which have been randomly drawn from four major industrial groups. The relevant data is to be gathered from the business establishments' purchasing executives, who are assigned the role of key-informants. The collected data will subsequently be analyzed through the use of several multivariate statistical techniques including analysis of variance.

Definition of Terms

The concept of first mover advantage is clouded by definitional and conceptual issues, as is suggested by the following series of definitions which are now discussed. In a major literature review of order-of-entry research, Kerin, Varadarajan, and Peterson (1992) noted the confusion regarding the definitional issue of first mover and identified three potential forms of pioneering. Accordingly, a firm could be designated as a first mover by being the first to either produce a new product, utilize a new process, or enter a new market. However, this conceptualization of first mover advantage in terms of product, process, and market orientation does not completely capture the definitional possibilities of pioneership. In their historical analysis of first mover advantage, Golder and Tellis (1993) defined pioneering to include: 1) the inventor - the firm that develops the patents or other important technologies within the new product category; 2) the product pioneer - the first firm to develop a working model or sample; and 3) the market

pioneer - the first firm to commercially market a product. Singlely (or in combination) any of these means may provide opportunities for the first entrant to gain positional advantage and market-share dominance over later-entering competitors. However, this tripartite conceptualization of pioneering leaves open the possibility that the technological originator - whether the patent holder or the firm which first developed a practical application for the technology - and the first mover from a commercial perspective may not, in fact, be the same. In their comprehensive examination of first mover advantage, Lieberman and Montgomery (1988) suggested that the appropriate domain of the pioneer is determined by the marketplace and is based on market entry, which is the perspective adopted for this study.

The consumer behaviorists working with first mover advantage suggest that the definition can also be approached from the perspective of the buyer. In one of the earliest studies of first mover advantage and its behavioral origins, the economist Schmalensee (1982) implicitly defined the first mover or pioneer as the first distinctly new product experienced by the consumer. Alpert, Kamins, and Graham (1992) conceptualized the pioneer as “a new product that is significantly different from any other product in the judgment of the reseller buyer” (p. 26). In *Positioning*, Ries and Trout (1981) defined first mover advantage from the perspective of the consumer’s mental landscape: “The easy way to get into a mind is to be first...If you don’t, then you have a positioning problem” (p. 9). While there is an internal logic in these definitions of pioneering from the perspective of consumer research, buyer-based definitions of the first mover assume that the true first mover was able to communicate this fact to potential consumers. This is an assumption which may not hold as later entrants with superior marketing skills may

overwhelm the initial buyer awareness established by the true pioneer and eventually capture a larger portion of consumer awareness (Kerin, Varadarajan, and Peterson 1992).

Definitional ambiguity also pervades the issue of product categorization. While the order-of-entry research community has debated the issue of what is a first mover, a second controversy arises when the question is posed: first entrant into what? According to Alpert (1987), the classic categorization paradigm viewed a category as possessing distinct attributes and clearly established relationships among those attributes. However, as Rosch (1978) has argued, such cleanly defined categories are rarely present and the predominately occurring natural category can only be described as a fuzzy set without distinct boundaries. Degree of difference has been suggested by Day, Shocker, and Srivastava (1979) as the appropriate arbiter of product category boundaries. If the degree of difference is relatively small, the new product should be classified as a product extension while pioneership should require a more significant change in the attributes of the product (Alpert 1987).

The definitional question of first mover is closely related to the broader question of whether and to what extent first mover advantage exists. By broadening the definition of pioneer to include the original patent holder or the developer of the first working model, Golder and Tellis (1993) were able to present examples of corporate history which suggested a smaller role for first mover advantage. This broadened, or liberal definition of the first mover was also utilized by Schnaars in his earlier work (1986) as well as in *Managing Imitation Strategies* (1994): "A pioneer is defined as any of those firms introducing a product to the market, up to and including the first to sell it successfully" (p. 14). Paradoxically, those advocates of first mover advantage whose empirical research is based on the PIMS database have also tacitly embraced a broadened definition

research is based on the PIMS database have also tacitly embraced a broadened definition of pioneer. This expanded definition is directed not towards the pre-commercial efforts recognized by Golder and Tellis (1993) but in the opposite, post-commercial introduction direction. This further source of confusion emanates from the survey instrument utilized in the PIMS database and from which so much of the empirical research on first mover advantage is based. As defined by PIMS, a pioneer is “one of the pioneers in first developing such products or services” (Buzzell and Gale, *The PIMS Principles*, 1987, p. 260). This broadened definition of pioneer implies that *first* may not mean *first*. Brown and Lattin (1994) formulated this point succinctly: “While the term itself (FMA) suggests an advantage that accrues *only* to the first entrant in a product category, it has in practice been used to describe the advantage enjoyed by early movers relative to late entrants” (p. 1361). Given the complexity and conceptual ambiguity which surround this marketing phenomena, the phrases *pioneer* and *first mover* will be used interchangeably throughout this study and will refer to the first firms to significantly commercialize a product. Although this interpretation does not offer the highest degree of purity in its intellectual clarity, the broadened interpretation of pioneer or first mover does conform to its use within the literature (Kerin, Varadarajan, and Peterson 1992; Kalyanaram, Robinson, and Urban 1996).

While the definitional issues surrounding first movers hint at the complexity of this phenomenon, the conceptualization of later entrants also has its difficulties. Those firms which follow the pioneer into the market may be classified in at least three ways. First, later entrants may be designated numerically by their sequence of entry, i.e. second, third, and fourth. Secondly, later entrants may also be distinguished by the elapsed time

since the entry of the first mover, as in the work of Brown and Lattin (1994). Thirdly, non-pioneers may be categorized as early followers and later entrants. As Lieberman and Montgomery (1988) pointed out in their analysis of first mover advantage, these methods of categorization may not be particularly consistent as in the hypothetical case of a firm which is the third market entry. In a product category in which there are a total of four firms, the company in question would be considered a later entrant. However, in a situation in which 20 firms were considered category competitors, this same third entrant would be classified as an early entrant.

For the purposes of this investigation, the nomenclature adopted by Alpert and Kamins (1992) in their study of reseller buyers will be utilized. These definitions and the tripartite classification scheme of pioneer, early follower, and late entrant have their origins in the original PIMS instrument (Buzzell and Gale 1987) as well as an extensive history within the order-of-entry literature (Robinson and Fornell 1985; Kerin, Varadarajan, and Peterson 1992). As this dissertation focuses upon the perceptions of industrial purchasing managers, the traditional definitions require a modification similar to that imposed by Alpert and Kamins (1992) and suggested originally by Schmalensee (1982). The category pioneer will be defined as the first new product which is significantly different from other products from the perspective of the industrial purchasing manager. The early follower is defined as that next firm (or firms, in the case of simultaneity) which enters the product category some period of time after the arrival of the pioneer. Although this early follower may possess slight differences in price, performance, or features, in the judgment of the industrial purchasing manager it is perceived to be highly similar to the first mover. All firms which enter substantially later

than the early follower and which bear a perceived similarity to the pioneer should be designated as late entrants. In this way, the study attempts to ascertain differences in industrial buyer beliefs, attitudes, and behavioral intentions toward first movers, early followers, and late entrants and thus contribute to marketing's understanding of order of entry in an industrial context.

Limitations of Scope

The parameters of a study establish the boundaries and exceptions which define the scope of the study (Creswell 1994). The research setting of this dissertation is limited on three dimensions. First, the scope of industrial purchasing behavior is large. Corporate purchasing agents may be involved in the acquisition of capital equipment, accessory equipment, component parts, process materials, maintenance and operating supplies, raw materials, and business services (Gross, Banting Meredith, and Ford 1993). Bearing the dissertation focus in mind, this study limits itself to a single category of industrial products. The study concerns itself with those component parts and assemblies which are incorporated into the buyer's final product. Purchased component parts and materials, by definition, are included in the manufacturing firm's end product (Haas 1992) and are of critical importance to the firm's competitive advantage (Porter 1980). According to DeRose (1991), purchased components and materials represent, on average, 52% of the cost of goods sold for the manufacturing sector.

The second limiting dimension of this study concerns the buyclass typology of *new task*, *modified rebuy*, and *straight rebuy* suggested by Robinson, Faris, and Wind (1967). Because the arena of interest of this study concerns attitudes towards order of entry within new product categories, this dissertation will confine its observations to the *new buy* industrial purchasing situation. This purchasing situation is characterized by higher levels of buyer involvement (Robinson, Faris, and Wind 1967) and consequently, extended search and consideration (Gross, Banting Meredith, and Ford 1993). A final limitation to the scope of this investigation is its reliance upon the self-reported beliefs, attitudes, and purchasing intentions of industrial purchasing managers. This point is treated in greater depth in the discussion of methodological issues which appears in the third chapter of this dissertation.

Significance of the Study

There is little question that research into first mover advantage has major implications for both marketing management as well as marketing research. What is perhaps less well-realized is the criticality of this issue in macroeconomic terms. The larger issue of first mover advantage is highly significant for a society founded upon innovation. A technologically-based culture, such as that of the United States, is heavily reliant upon innovation as a source of economic competitiveness both at home as well as in the global economy. As global markets become increasingly realized in the twenty-first century, and as globalization creates competitors with widely divergent cost structures, innovativeness and, by implication, pioneer advantage may emerge as critical

to national competitiveness. Furthermore, in a business environment in which cost and differentiation advantages can be readily replicated, first mover advantage has been described as representing one of the very few means for firms to attain *sustainable* competitive advantage (Alpert and Kamins 1994). With its focus on the behavioral implications of order of entry for industrial purchasing, this research project offers insight for the industrial marketing strategist considering entry into a new product category. For industrial marketers, the business market is critical and large, representing approximately one third of gross national product (Kotler 1997). While the first mover hypothesis has increasingly become regarded as an empirical generalization, relatively little is known of the sources of this advantage, particularly those sources which are behavioral rather than economic. Because the order-of-entry question represents a significant aspect of industrial marketing strategy and one of the few sources of sustainable competitive advantage, it is critical that industrial marketing management gain insight into the psychological processes of their customers. Among the most influential of these customers are, of course, industrial purchasing managers, the focus of this study.

Behavioral processes as a conceptual explanation of first mover advantage have gained increasing currency within the order-of-entry research community. Order of entry has been proposed to influence market performance through prototypicality (Carpenter and Nakamoto 1989; 1994), brand retrieval and consideration set formation (Kardes and Kalyanaram 1992; Kardes, Kalyanaram, Chandrashekar, and Dornoff 1993), and attitude towards the brand (Alpert, Kamins, and Graham 1992; Alpert and Kamins 1995). In turn, these psychological processes - together with others - have been integrated into a framework which has been proposed as a potentially robust source of pioneer advantage

(Alpert and Kamins 1994). All have been extensively cited in subsequent order-of-entry research and one of these research avenues - Carpenter and Nakamoto (1989) - has been recognized by marketing scholars for its significant contribution to marketing research in the form of the O'Dell award. A significant signal of peer recognition, the O'Dell Award is presented annually for the *Journal of Marketing Research* article published five years previously which is judged as having made the greatest contribution to marketing research. Furthermore, marketing research's uncovering of and work with these behavioral sources of pioneer advantage has resulted in cross-disciplinary citations (Cahill 1996), reversing the declining participation of the marketing research community in strategic marketing issues (Day 1992).

Order-of-entry research has been characterized by its use of multiple research designs and sample frames (Kalyanaram, Robinson, and Urban 1995). However, no research has specifically examined this issue in an industrial context. In a recent summation of order-of-entry research (Kalyanaram, Robinson, and Urban 1995), it was noted that initial behavioral insights into first mover advantage have been highly encouraging. While these behavioral mechanisms have previously been explored in the context of consumer goods, the question arises: Do similar mechanisms prevail in industrial markets? The first mover hypothesis has been vindicated at an econometric level in several industry-specific (Mitchell 1991; Mascharenhas 1992) as well as cross-sectional studies (Robinson 1988; Lambkin 1992) of industrial products manufacturers. This survey-based investigation offers the possibility of establishing a convergent validity with these other research efforts as well as an alternative perspective into the origins of

first mover advantage in the industrial marketplace.

Structure of the Dissertation

In closing this introduction, the reader is provided with a guide to the remainder of this dissertation. The next chapter thoroughly reviews the order-of-entry and industrial buying behavior literatures which form the background for this study. This literature review will further illuminate issues which were introduced as justification for this investigation and establish a context for this dissertation. Following this development of the research context, a formal series of hypotheses are presented to lead off the third chapter. Chapter three also details various aspects of the research methodology, including the research setting, the sampling plan, data collection methods, data validation, and the analytic techniques. The fourth chapter will focus solely on the analysis of the data and the testing of the hypotheses. The fifth and final chapter of the dissertation will outline the contributions of the study and evaluate the implications of the findings. In addition, this section will consider the relevant limitations of the research and provide suggestions for future research.

CHAPTER II

LITERATURE REVIEW

While the flavor and findings of the order-of-entry literature have been suggested in the previous discussion, this chapter more thoroughly explores the relevant literatures that form the basis for this dissertation. Four major discussions are unfolded within this chapter. The first of these is a thorough review of the empirical studies of first mover advantage. Within this review both industry-specific as well as cross-sectional approaches to pioneer advantage research are covered. Highlighted within this discussion are the limitations of this research stream and contemporary appraisals of the research boundaries which delineate this area of marketing strategy research. The second section of this literature review examines in more detail the extant literature regarding the conceptual sources of pioneer advantage. Both the economic-analytic as well as the behavioral sources of pioneer advantage are covered in this section. This discussion culminates with an explication of the research gap to be investigated. The third and fourth sections of this literature review focus on the research dimensions adopted in this study. Specifically, these research dimensions include presentations of the relevant industrial buying behavior literature as well as a consideration of multiattribute attitude models as they relate to the marketing literature.

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Review of Empirical Order-of-Entry Literature

The issue of first mover advantage is ultimately an empirical one. In the following section, an extensive literature review of order-of-entry research is presented. The empirical evidence in support of the first mover hypothesis, both industry-specific as well as cross-sectional, is introduced. Following this presentation, the limitations and criticism of this research stream are articulated. Potential conceptual explanations are advanced and the section culminates in the exposition of a contingency-based approach to pioneer advantage. Conceptual issues are addressed after the presentation of the empirical literature because the empirical findings stimulated research interest in the conceptual basis for first mover advantage.

The recent empirical evidence for first mover advantage can largely be divided into two camps: industry-specific research and cross-sectional research. Industry-specific research focuses on archival records or survey research and ranges across a broad spectrum of industries including pharmaceutical drugs (Bond and Lean 1977), cigarettes (Whitten 1979), semiconductor submarkets (Flaherty 1984), medical diagnostic imaging equipment (Mitchell 1989; 1991), semi-submersible oil drilling equipment Mascharenhas 1992), Iowa newspapers (Glazer 1985), word processing software (Green, Barclay, and Ryans 1995) and business graphics software (Green, Barclay, and Ryans 1995). In addition to the aforementioned published studies, a considerable body of industry-specific evidence supportive of first mover advantage exists in the form of unpublished doctoral dissertations. Among these studies are examinations of the role of

order of entry in the following industries: financial services (Peppers 1991), Northern California radio stations (Bolton 1990), airlines (Copeland 1990), and personal and mini-computers (Schoenecker 1995). The second category of supporting evidence is drawn from cross-sectional research based upon the Profit Impact of Marketing Strategy or PIMS project as well as other databases such as ASSESSOR and BEHAVIORSCAN. The argument that initial market entrants achieve long-term competitive advantage over their rivals as defined by market share is impressive. Because the historical origins of empirical research into first mover advantage are rooted in industry-specific research, this category of evidence will be considered first.

Industry-Specific Studies

The earliest of these industry-specific studies took place against a backdrop of governmental concern regarding potential marketing abuses within the pharmaceutical industry. On November 8, 1973, in accordance with the powers provided by Section 6 of the Federal Trade Commission Act, the Federal Trade Commission adopted a resolution authorizing the investigation and collection of data pertaining to certain prescription drugs. One of the outcomes of this investigation was Bond and Lean's (1977) study of order-of-entry effects within the oral diuretic and antianginal drug markets. Based upon a survey of the relevant market, 132 respondents were identified as manufacturers of the drugs in question. Modeling average annual sales revenue as the dependent variable, Bond and Lean (1977) considered contributory factors such as patents and licenses held, promotional expenditures by brand, price, market power of the corporation, and sequence of market

suggested that there was no statistically significant relationship between promotional expenditure and sales performance. However, a highly significant first mover advantage was noted in the multiple regression analyses of the markets for oral diuretic ($B = 11.66, t = 4.48$) and antianginal drugs ($B = 14.33, t = 56.89$). Within the oral diuretic category the dramatic sales achieved by the first brand appeared to stimulate other firms to circumvent the original patent and enter with closely substitutable products. In the antianginal market, no such patent protection was available to the first mover. Although the original monopolistic shares of the category pioneers were eroded by following competitors, the first mover in both markets retained a degree of market leadership that was not associated with brand promotion or any of the other considered variables. The findings of this study strongly support the identification of order of entry as a significant contributor to long-term firm performance:

“The advantage to firms of being first to offer a new type of drug is considerable, and physician’s long-term preferences for the first brands appears to insulate firms from competition even more effectively than patents.” (p. 77)

Within the context of social policy, Bond and Lean (1977) noted that while drug brand specification was a significant concern of the physician community, there was little, if any, financial incentive for physicians to prescribe based upon price. Consequently, the absence of price as a purchasing criteria represents a significant limitation to the generalizability of this study (Kerin, Varadarajan, and Peterson 1992). Nevertheless, Bond and Lean’s (1977) documentation of first mover advantage within narrowly-defined pharmaceutical categories stimulated a generation of research by business scholars (Robinson, Kalyanaram, and Urban

1994).

An outgrowth of the Bond and Lean (1977) findings regarding pioneer advantage within the pharmaceutical industry, Whitten's (1979) analysis of order-of-entry effects focused on product categories in the cigarette industry from 1913 through 1974. These submarkets included both 70mm as well as 85 mm non-filters, plain filters, menthol filters, high-fiber filters, charcoal filters, and low-tar filters. Whitten noted that price competition was an insignificant factor in both the cigarette industry during the time of this analysis as well as in the pharmaceutical markets studied by Bond and Lean (1977). However, Whitten differentiated his study from previous research by focusing on the role of the ultimate user of the product rather than the specifying physician. Relying upon archival research, Whitten (1979) found that the success of the first entry stimulated the subsequent entry of competitors with little or no differentiation in product. With little or no product differentiation and no competition based upon price, Whitten perceived the cigarette industry as a homogeneous market ideal for the study of entry advantage. His research was able to find support for a substantial order-of-entry effect in six out of seven submarkets studied:

“...the first firm to offer, promote, and widely distribute a brand for which there was a favorable market trend received a substantial and oftentimes enduring sales advantage...(despite the fact that)...five out of seven first entry brands had smaller advertising expenditures per million cigarettes than did their competitors. “
(p. 41)

Although somewhat ancillary to the issue of first mover advantage, Flaherty's (1984) examination of the linkage between technological innovation and market growth within the international semiconductor industry has been cited as a contribution to order-of-entry research (Kerin, Varadarajan, and Peterson 1992). Working from the perspective

of field research, this study ranged across ten submarkets within the semiconductor industry including semiconductor components, capital equipment, and materials as well as finished semiconductors. A small although significant simple correlation was found between order of market entry and market share, substantiating the first entrant hypothesis advanced by earlier research (Bond and Lean 1977; Whitten 1979). However, Flaherty (1984) did note that this relationship was moderated by product quality as well as skills in application engineering. This recognition presaged, in part, the contingency approach to first mover advantage later articulated by Kerin, Varadarajan, and Peterson (1992).

The growing maturity of order-of-entry research is witnessed in Mitchell's (1989; 1991) investigations of the role of first mover advantage within the medical diagnostic imaging industry. Drawing upon previous research which had pointed towards the emerging empirical generalization that order of entry was negatively related to long-term market share (Bond and Lean 1977; Lambkin 1988), Mitchell sought to extend the theoretical literature in market disequilibrium (Schumpeter 1942). Specifically, Mitchell examined the role of industry-specialized assets and competitive threats to the firm's core products as major influences on the firm's entry timing decision. This study focused on pure manufacturing entry so as to better capture the potential risk to specialized assets that entry into a new market may bring. The arena of interest for this study was the medical diagnostic imaging industry and, in particular, five subsets of this market. These five submarkets and the years in which the respective technology were first pioneered follow: nuclear medical (1959), ultrasound (1963), computer tomography (1973), magnetic resonance (1980), and digital radiography (1981). Mitchell found that as each

successive technology emerged, the sales of older technologies declined, leaving the previous incumbents with an entry decision: Whether and when to enter the emerging market. Two statistical methods, logistic regression and accelerated event-time analysis, were used to test the hypotheses that the possession of industry-specialized assets and competitive threats to the firm's core products were major influences on the firm's entry timing decision. Mitchell (1989) found evidence to strongly support the second hypothesis: competitive threats to the firm's core products were found to be a determinant of early though not first entry. While not statistically significant, evidence pointed towards the reluctance of firms to enter new markets when doing so would render meaningless the value of their specialized assets. Drawing upon his findings that entry timing was influenced by competitive rivalry and the possession of specialized assets, Mitchell (1991) attempted to measure first mover advantage in terms of market share and survival within the medical diagnostic imaging equipment industry. The central research question of this study was whether the effects of early or late entry varied by whether the firm in question was an industry newcomer or an industry incumbent. Specifically, Mitchell (1991) hypothesized that an industry newcomer's performance is predicted by its order of entry relative to all competitors. The findings of this analysis strongly support the contention that market share for newcomers to an industry is closely linked to order of entry: early entrants enjoyed a sustained market share advantage relative to late entrants after both the fourth year ($B = -5.677, p = 0.01$) as well as the ninth year of industry participation ($B = -3.178, p = 0.01$). However, for industry incumbents entering an emerging sub-market, the order-of-entry effect was highly mitigated by time within the new market. While first mover advantages were robust after four years ($B = -2.750, p = 0.05$), the negative relationship

between order of entry and market share was overturned by the ninth year ($B = 5.022$, $p = 0.01$). In his discussion of these results, Mitchell (1991) speculated that the incumbent's possession of specialized assets such as dedicated field sales forces and cross-subsidization of technology, distribution, and capital may have resulted in the overcoming of first mover advantage by late-entering industry incumbents. Mitchell's (1991) mixed findings regarding order of entry, and particularly his conclusions regarding industry incumbency again presage the contingency theory of first mover advantage (Kerin, Varadarajan, and Peterson 1992).

Mascarenhas' (1992) examination of order-of-entry effects within the semi-submersible oil drilling industry represents one of the very few studies of first mover advantage within an international context. This research study is also unique in the literature for its focus upon a service industry rather than the manufacturing sector. As noted by Mascharenhas (1992), the semi-submersible oil drill was developed in 1962 by Shell Oil as a rig resting above the water surface on large buoyant pontoons. It was this flotation technology which allowed the drill to operate in deep water conditions yet remain stable in agitated seas. As a major oil company, Shell Oil felt that involvement in the drilling industry was strategically inappropriate and made public all patents regarding its innovation in an attempt to encourage wider supply and demand for the specialized rig. As a result of this action, an international semi-submersible oil drilling industry arose, characterized by initial high uncertainty, high capital costs (\$60 million per unit in 1984), and potential buyer switching costs. These independent drilling firms contracted out their services to major oil companies and were, in term, compensated on a project by project basis. In this longitudinal study, Mascharenhas (1992) identified 143 firms which entered

the semi-submersible drilling industry during the period between 1962 and 1984. The relevant market was defined at the national level as energy is often seen as critical to national security and the balance-of-payments status. Furthermore, the national government is often a joint venture partner in the oil extraction industry. Because of this governmental involvement in the process, pressures often exist to use local national drilling firms rather than the more-experienced multinational drilling contractors if it can be demonstrated that the local firm possesses the required competency. According to Mascarenhas (1992), the effect of this tendency towards localization has been hypothesized to counteract the advantages of the first mover. In offshore drilling, a pioneer may derive first mover advantages through the pre-emption of prime drilling locations or agents influential with local governments. In addition, the experienced drilling contractor should be able to benefit from the presence of high buyer switching costs and levels of perceived risk. A total of 46 national markets were identified where semi-submersible oil drilling had been actively pursued during the relevant time period. The central research question of this study was whether or not pioneers exhibited higher market shares at the 1984 census after controlling for market localization. A multiple regression methodology was utilized in which market share was modeled as a dependent variable. Firm nationality and order of entry were identified as independent variables. The issue of entrant survival was addressed through the use of two regression equations: one which included only surviving entrants ($R^2 = 0.29$) and a second which included all firms which had been involved in the industry during the period of interest ($R^2 = 0.16$). The results of this study confirmed the first mover advantage hypothesis at the $p < 0.01$ level for both samples, although the relationship between pioneering was twice as strong in the sample which was limited to

surviving firms. The implication of this finding was that although pioneer advantage could be demonstrated within the semi-submersible oil drilling industry, research designs which excluded non-survivors may systematically over-estimate the strength of the order-of-entry effect. This potential upward bias in estimates of first mover advantage is discussed in greater detail as the limitations of this research stream are considered.

While empirical studies in marketing typically involve actual firms, Green and Ryans' (1990) examination of entry strategies and their market performance utilized data gathered from the business simulation *Markstrat*. According to these authors, the *Markstrat* environment was chosen as a laboratory for the study of order of entry for several reasons. Prominent among these were the absence of survivor bias, the lack of perceptual bias regarding entry strategy, the minimization of measurement error, and the realism of the simulation. Furthermore, *Markstrat* represents an attractive research vehicle for the study of entry strategy in that participants control timing of entry and commitment to the market. The *Markstrat* simulation involves five hypothetical firms competing within the same business environment but with different competitive positions and resource bases. While the simulated environment is homogenous regarding customer needs, latent demand, and underlying market growth rate, the competitive environment can differ dramatically based upon the actions of those firms which choose to participate in the new market. Participants in the simulation were 55 second-year MBA students who had been randomly assigned to one of the five hypothetical firms of differing but relatively equal competitiveness. Of the 55 participants, 45 chose to enter the emerging Vodite market, the hypothetical industry presented in the simulation. Employing a partial least squares methodology, Green and Ryans (1990) found that order of entry was

negatively related to performance, substantiating the first mover hypothesis that early entry is associated with superior market share performance ($B = -0.311$, $t = -0.071$). However, this effect was found to be largely indirect. Early entry improved market share performance through increasing levels of investment and competitive positioning - the other variables controlled by participants. While the total effect of timing of market entry was the aforementioned -0.311 , direct effects represented only -0.017 of the total and indirect effects represent the balance of -0.294 . For purposes of comparison, the strongest path in the model was the magnitude of marketing investment, with a total effect of 0.852 . While generally supportive of the first mover hypothesis, this study may be seen as highly illustrative of the complexity of this marketing phenomenon.

A second industry-specific study characterized by its unique approach to order-of-entry research was Gannon, Smith, and Grimm's (1992) analysis of organizational predictors of first movement within the domestic airline industry. While order-of-entry research has largely focused on the strategic issue of market entry into a new product category, Gannon, Smith, and Grimm's (1992) area of interest is largely tactical in nature. The focus of their research was marketing mix decisions such as new pricing actions, new promotional campaigns, the opening of new service routes, and the introduction of new aircraft types. Archival data for the period 1979 through 1986 were gathered from *Aviation Daily*, *Air Carrier Financial Statistics*, and *World Aviation Directory*. The perspective adopted in this study distinguishes it from other work in the order-of-entry research stream (Robinson and Fornell 1985). The traditional perspective in first-mover studies has defined order of entry as an independent variable and the resulting market share as a dependent variable. However, Gannon, Smith, and Grimm

(1992) reversed this orientation by considering first mover activity as the dependent variable while factors such as level of formal education, years of industry experience, hierarchical formalization, and boundary spanning activity were modeled as independent variables. The methodology employed was Tobit analysis. The finding of this research supported the hypothesis that first mover activity was related to an increase in boundary spanning ($B = 1.41, t = 3.23$). This relationship was found to be significant at the $p < 0.01$ level. First mover activity was also found to be significantly related at the $p < 0.001$ level to a lower degree of formalization within the organization ($B = -3.54, t = -4.20$). Additionally, the profile of first movers was characterized by higher levels of formal education ($B = 0.95, t = 3.65$) with lower levels of industry-specific experience ($B = -0.57, t = -2.25$). Gannon, Smith, and Grimm's (1992) study of organizational characteristics and their relationship to first mover activity has contributed to a broader understanding of order-of-entry strategy.

The changing nature of the order-of-entry research stream was exemplified by the recent work of Green, Barclay, and Ryans (1995) and their study of two software applications. Complementing the perspective on pioneer advantage offered by Kerin, Varadarajan, and Peterson (1992), Green, Barclay, and Ryans (1995) examined first mover advantage within the broader framework of entry strategy, external market characteristics, and internal sources of competitive advantage. Archival data from the trade and general business press as well as the results of a *PC Magazine* interactive reader survey provided these researchers with the data to measure variables such as performance, magazine coverage, quality, value, advertising investment, number of competitors, and timing of entry. A partial least squares (PLS) model was utilized in

order to maximize the prediction of performance. The first of their twin studies attempted to capture the profitability and market share performance of various manufacturers of professional word processing software based upon the set of aforementioned variables. The results supported the impact of timing on market share, both directly ($B = 0.022$) and indirectly ($B = -0.266$) through the degree of magazine coverage of the product. While the total effect ($B = -0.232$) of timing of entry on subsequent market share was substantial, it should be noted that the major portion of this effect was classified as an indirect effect, expressing the effect of early entry upon editorial coverage. However, the second study charting the business graphics industry resulted in a very different mix. Although the direct effect of timing of entry was substantial ($B = -0.282$), the indirect effect of timing upon magazine coverage was the opposite of that noted in connection with the first study ($B = 0.354$). Consequently, the Green, Barclay, and Ryans (1995) study of order of entry in the business graphics industry suggested the presence of first mover disadvantage. The finding that late entry garnered more favorable editorial comment could be interpreted to suggest that later entrants benefited from the technological developments of the pioneers, echoing the “free rider” arguments advanced by Schnaars (1986; 1994). Green, Barclay, and Ryans (1995) proposed that pioneer advantage is not a universal construct, and that external market factors and firm competencies were integral aspects of market share performance.

The empirical study of first mover advantage has its origins in industry-specific research which was designed to guide the formulation of governmental policy regarding the marketing of pharmaceutical drugs (Bond and Lean 1977). Over the course of the past two decades, industries as diverse as cigarettes and medical diagnostic imaging have served

as the subject of academic inquiry into the existence and nature of first mover advantage. This search has extended across consumer goods, industrial markets, and service industries. The methodologies employed in these research exercises include: multiple regression (Mascarenhas 1992), Tobit analyses (Gannon, Smith, and Grimm 1992), logistic regression (Mitchell 1991), accelerated event-time analysis (Mitchell 1989), and partial least squares (Green, Barclay, and Ryans 1995). The findings from these industry-specific studies have been nearly unanimous in their conclusions: that order of entry is highly correlated with market share performance. While the findings from these studies offer significant support for the first mover hypothesis, research utilizing industry-specific data does not offer the generalizability that may be found in cross-sectional data which has been drawn from large sectors of the economy (Hair, Anderson, Tatham, and Black 1995). For such a perspective it is advantageous to examine the findings of research which has been based upon large cross-sectional databases such as PIMS.

Cross-Sectional Research

While the accumulated weight of this industry-specific research offers major support in favor of first mover advantage, the generalizability of this knowledge remains an open issue due to the idiosyncratic nature of some of the previously cited industries (e.g. cigarettes, semiconductors, hypothetical vodite, and pharmaceuticals) (Kerin, Varadarajan, and Peterson 1992). The argument that market pioneering offers a sustainable means of competitive advantage is strongly bolstered by empirical evidence drawn from cross-sectional data, particularly from within PIMS-based research. All known studies of order of entry based upon

the PIMS database support the empirical generalization that there is a negative relationship between order of entry and market share, that is, first movers enjoy a statistically significant market share advantage over later entrants (Kalyanaram, Robinson, and Urban 1995). The flavor and findings of the PIMS-based research are best suggested in the subsequent discussion and by the following table (Table 1) which illustrates the descriptive statistical profile of market share based upon order of entry across PIMS-based studies drawn from different sections of the database. This statistical profile indicates that, across studies and on average, pioneering firms enjoyed a substantially higher market share performance over both early followers as well as later entrants. Indicative of the consistency of the PIMS-based findings, the studies described in the accompanying table (Table 1) are discussed in subsequent detail.

<u>Study</u> <u>Entrants</u>	<u>Pioneers</u>	<u>Early Followers</u>	<u>Late</u>
Robinson and Fornell (1985)	29%	17%	12%
Robinson (1988)	29	21	15
Lambkin (1988)	32	19	13
Lambkin (1992)	29	20	14

The earliest of these studies was Robinson and Fornell's (1985) investigation of

pioneer advantage within mature consumer goods industries. Drawing upon the then unpublished work of Urban, Carter, Gaskin, and Mucha (1986), Robinson and Fornell modeled first mover advantage in terms of market share. According to this perspective, first mover advantage represented the indirect effect of order of entry upon market share. They hypothesized that this resulting market share was a product of relative marketing mix, relative direct cost, and the relative consumer information advantages which were obtained through early entry. Robinson and Fornell (1985) traced their inclusion of the consumer information advantage variable to the work of the consumer economist Schmalensee (1982) and argued that consumer learning, when it is based upon product usage, has the potential to provide the pioneer with an information advantage over subsequent entrants to the market. Their operationalization of this theoretical model involved a system of five linear equations in which the respective dependent variables represented market share, product quality relative to competition, product line breadth relative to competition, price relative to competition, and direct cost relative to competition. In the Robinson and Fornell (1985) model, a business was classified as either a pioneer, an early follower, or a late entrant. Dummy variables were used to represent pioneers, early followers, and late entrants as well as the qualitative characteristics which embodied the research questions into various sources of pioneer advantage. These qualitative characteristics sought to describe the pioneer in terms of whether or not convenience goods were sold, shopping goods were sold, seasonal products were sold, products were redesigned on an annual basis, and if the firm participated in an advertising-intensive industry. Nine hypotheses were developed and these were largely based upon the barriers-to-entry research of Bain (1956) and the consumer economics work of Schmalensee (1982). These hypotheses were designed so as to explain

the finding uncovered in the descriptive statistical analysis of the data (Fig. 1): that a major premium in market share was associated with the act of pioneering. This premium between pioneers and late entrants was, on average, 17 market share points. The configuration of the hypotheses mirrored the indirect effect of order of entry upon market share proposed in the Robinson and Fornell (1985) model. For instance, the first hypothesis stated that: "Higher product quality increases market share and market pioneers tend to have higher product quality" (p. 307). The model was estimated by both two-stage and three-stage least squares, and identical conclusions were reached regarding each of the hypotheses. As reported by Robinson and Fornell (1985), the principal findings of this investigation strongly support the existence of first mover advantage:

"The empirical evidence indicates that both consumer-based and firm-based factors result in long-term market share advantages for pioneers relative to later entrants. Overall, the results suggest that order of entry is a major determinant of market share for a broad cross-section of consumer goods industries." (p. 305)

Robinson and Fornell (1985) expressed the empirical results of their study in terms of *share point advantage* (SPA), which is the multiplicative product of the pioneer's effect on the variable in question and the variable's contribution to market share. The results of their study supported several broad conclusions: that pioneers tend to possess higher product quality (SPA = 4.27) and broader product lines (SPA = 3.83) than do later entrants. Additionally, pioneers and later entrants were found to have similar pricing though widely differing market shares (SPA = 9.02) when goods of relatively similar quality were compared. Market pioneers within convenience goods industries were found to have stronger market shares (SPA = 7.87), potentially validating distribution

advantages as a source of first mover advantage. Support was also found for the consumer information hypothesis in industries in which purchase price and purchase frequency were low ($SPA = 5.01$). However, in industries characterized by intensive advertising or relatively frequent product line turnover, statistically significant first mover advantage was not found.

Robinson's second study (1988) was essentially a replication of his earlier work (1985) with a shift in sample frame and focus from consumer to industrial products. The descriptive statistical profile indicated that, on average, pioneers in industrial markets commanded a substantial market share premium of 14 percentage points over later entrants (Fig. 1). Similar to the earlier study (1985), Robinson conceptualized this market share advantage as an indirect effect of pioneering. His conceptual model of industrial first mover advantage was identical to that proposed for consumer markets with the sole exception that switching costs were substituted for the consumer-based information advantage component of the first model (1985). While Robinson acknowledged the criticality of pioneer brand name awareness in these industrial markets, his focus in this study rested on the order-of-entry advantages of switching costs which were described by Porter (1980) as dedicated assets, specialized plant and equipment, and transaction economies. Consequently, the relative advertising and promotion measures which were used in the 1985 study were replaced by relative salesforce expenditures in the 1988 study. Drawing largely on the barriers to entry (Bain 1956) and organizational economics (Porter 1980) literatures, Robinson tested 11 hypotheses, five of which were unique to this study. The remaining six hypotheses had previously been evaluated in the context of his earlier consumer products study (Robinson and Fornell 1985). Prominent examples of this shift in focus may be

illustrated by his inclusion of relative backward and forward integration, reflecting the coordination benefits in manufacturing as well as the stronger sales and service dimensions which are characteristic of industrial markets. The model was estimated by three-stage least squares, essentially duplicating the methodology used in the first study. Echoing the findings of his earlier study (1985) of first mover advantage in consumer markets, Robinson (1988) concluded from this sample of 1209 industrial product manufacturers that:

“In a broad cross section of mature industrial goods businesses, market pioneers have important market share advantages over later entrants...These share advantages are influenced by both business and industry characteristics.” (p. 93)

Foreshadowing later investigations (Lambkin 1988; 1992; De Castro and Chrisman 1995), Robinson found that first mover advantage was influenced by firm strategy and industry structure. Paralleling the presentation of results utilized his earlier work (1985), Robinson (1988) expressed the empirical results of his study in terms of *share point advantage* (SPA), which is the multiplicative product of the pioneer’s effect on the variable in question and the variable’s contribution to market share. Findings from this industrial study mirrored his earlier research (Robinson and Fornell 1985) with regard to relative product quality (SPA = 4.27) and relative product line breadth (SPA = 3.83). While first movers enjoyed advantages in these two dimensions vis-a-vis later entrants, pioneer pricing was not dissimilar from the pricing of later entrants (SPA = 0.18). As with consumer markets, industrial first mover advantage was found not to be predicated on direct cost savings or more aggressive pricing. First mover market share was found to be positively related to industry value added (SPA = 0.02) and negatively to industry new product sales (SPA = -0.08). Several major conclusions can be drawn in comparing these two studies. First, Robinson (1988) found that

pioneer share advantages were positively related to purchase amounts in excess of \$10,000 in industrial markets (SPA = 4.29). The opposite pattern was detected in consumer markets, where a relatively strong pioneer advantage was found to be associated with purchase amounts under \$10 (SPA = 6.75). That is, in industrial markets, first movers tended to benefit from larger product purchase amounts while in consumer markets first movers tended to benefit from smaller purchases. The second major distinction between these two markets in regard to first mover advantage is that the magnitude of pioneer market share in industrial markets was initially but not permanently

less than that found in consumer markets. Within product categories which were less than 20 years old, consumer product pioneers had established, on average, a 23.56 market share point advantage over late entrants. That differential may be compared to the 17.16 market share point advantage found in industrial markets. However, Robinson found that after two decades in the marketplace, pioneer advantage in industrial markets was measured at 13.01 market share points versus 12.75 share points in consumer markets, reversing the initial advantage of first movers in consumer markets.

Building upon these studies (Robinson and Fornell 1985; Robinson 1988), Lambkin (1988) examined the order-of-entry issue from the perspective of the entrant's structure and strategy and grounded her theoretical model in the population ecology framework described by Hannan and Freeman (1977). This research effort involved the PIMS start-up database (STR4) with a sample size of 129 firms as well as the main PIMS database (SPI4) with a sample size of 187 firms. In this study, Lambkin was able to corroborate the earlier findings of Robinson and Fornell (1985) regarding the following three pioneer characteristics. First movers were found to possess broader product lines as well as a more extensive market

distribution network. Secondly, first movers were found to possess a substantial product quality advantage relative to later entrants together with higher levels of customer support services. Again mirroring the earlier findings from Robinson and Fornell (1985), Lambkin found little evidence of differences in price levels between first movers and later entrants. Those differences which were noted indicated that pioneers priced their products at a slight premium to their later counterparts. Lambkin (1988) noted the counter-intuitive nature of this pricing pattern given that pre-emptive pricing strategies had been believed to be characteristic of aggressive first movers seeking to slide down the experience curve (Lieberman and Montgomery 1988). The overall results of this study confirmed the findings of earlier PIMS-based studies in that first movers obtained substantially higher levels of market share than later entrants:

“The results of this study strongly support the basic premise that order of entry is systematically related to competitive performance...these results confirm the general tendency observed in previous research that pioneers out-perform all later entrants.” (p. 137)

From a multiple regression perspective, Lambkin (1988) found that the main effect of the order-of-entry variable on market share was relatively robust ($R^2 = 0.13$ for the STR4 data and $R^2 = 0.21$ for the SPI4 sample). Additionally, the significance level of the aforementioned results was at the $p < 0.000$ level. These results compare favorably to the often-cited relationship between market share and profitability ($R^2 = 0.13$) uncovered in PIMS research (Buzzell and Gale 1987). However, after Lambkin included her hypothesized moderating variables describing firm strategy and structure, the strength of this relationship was substantially increased ($R^2 = 0.59$, $p < 0.000$ for the STR4 data and

$R^2 = 0.82, p < 0.000$ for the SPI4 data), foreshadowing the nature of later work in order-of-entry research by Lambkin (1992) as well as others (Kerin, Varadarajan, and Peterson 1992; Szymanski, Troy, and Bharadwaj 1995).

Approaching the order-of-entry question from an entrepreneurial perspective, Miller, Gartner, and Wilson (1989) conducted an analysis of 119 newly-established manufacturing ventures from the PIMS STR4 database. This study differentiated itself from earlier work in the field through its focus on new rather than mature corporate entities, thus extending the boundaries of the research domain. Multiple regression was utilized to estimate the relationship between order of entry and market share performance.

As in previous research (Lambkin 1988), the predictive power of early versus late entry on market share was found to be robust ($R^2 = 0.10, p < 0.000$). Drawing upon the strategy literature (Porter 1980), Miller, Gartner, and Wilson (1989) examined the questions of whether pioneers achieved significant differentiation and cost advantages over later entrants through the use of ANCOVA techniques which controlled for the effects of market share. Market share was controlled in order to isolate the effect of order of entry upon the competitive strategy decisions of the firm. The construct of differentiation was operationalized utilizing several different variables, including: relative product quality, relative product differentiation, relative service quality, relative marketing expenditure, and relative R&D expenditure. The construct of cost leadership was operationalized utilizing measures of both relative cost as well as relative price. A multivariate group test of significance was calculated with MANOVA, yielding a comparison of pioneer and late entrant group means on the measures in question. The outcome of this investigation supported earlier conclusions (Robinson and Fornell 1985)

regarding the competitive advantage of pioneer firms in terms of product differentiation through superior product and service quality. Significant differences between pioneers and late entrants were noted in relative product quality ($F = 9.14, p < 0.003$) as well as relative service quality ($F = 5.14, p < 0.025$). While the MANOVA results indicated that there were no significant differences between pioneers and late entrants regarding relative marketing expenditures, this was not the case regarding research and development (R&D). Pioneers were found to have significantly higher levels of R&D ($F = 11.70, p < 0.001$), which Miller, Gartner, and Wilson (1989) associated with the competitive advantage of pioneers in product quality and service. Following firms were found to offer lower prices than did pioneers ($F = 2.60, p < 0.110$), but this pricing strategy was not associated with lower cost structures ($F = 0.79, p < 0.374$). This disparity in terms of gross profit margin was thought to be important in increasing first mover advantages, as the greater profitability of pioneering firms could be translated into increasing investments in continuous innovation in product quality as well as service. With both differentiation as well as cost disadvantages, Miller, Gardner, and Wilson (1989) portrayed late entry as a significant handicap in the new corporate venture environment.

Although somewhat tangential to a narrowly defined order-of-entry research stream, Robinson's (1990) investigation of product innovation and market share performance offered several insights into first mover advantage in industrial markets. Multiple regression was utilized to model the relationship between independent variables such as product innovation and relative product advantage and the dependent variable, market share. Firstly, product innovations were found to typically diffuse at a greater rate in industrial rather than consumer markets. Robinson (1990) explained this differential

diffusion rate as a function of the fewer customers with which the industrial firm interacts as well as the information advantages that the professional industrial purchasing agent may possess. Secondly and counterintuitively, a proprietary technology which created only an incremental innovation may have an initially negative effect upon market share (mean = -4.0). However, as Robinson (1990) noted, this finding did corroborate Rogers' (1983) work with innovation attributes and relative adoption rate. A critical outcome of Rogers' research (1983) was the conclusion that innovations diffuse more rapidly as the relative advantage of the innovation versus close substitutes is increased. Robinson did, however, find that a proprietary technology which leads to a major product advantage can be translated into substantial market share gains (mean = 14.0) by out years three and four.

While previous order-of-entry research (Robinson and Fornell 1985; Robinson 1988) had attributed the long-term market share advantages of pioneers to their ability to erect barriers to entry, Parry and Bass (1990) focused their research effort on the relationship between industry concentration and pioneer advantage. Drawing upon the organizational economics literature (Porter 1980; 1985), Parry and Bass speculated that those entry barriers which increase seller concentration may also be linked to the creation of pioneer advantage. Examining the nature of first mover advantage from the perspective of concentrated versus fragmented markets, Parry and Bass (1990) defined a concentrated market as one in which the sum of the market share levels for the four leading competitors exceeded 55%. By comparing the direction and magnitude of pioneer advantage in concentrated versus fragmented markets, Parry and Bass (1990) attempted to distinguish between "the benefits of participation in a concentrated industry and the

incremental benefits associated with pioneer entry” (p. 188). Working from the PIMS SPI4 database, Parry and Bass (1990) examined two samples: one of which contained 593 mature consumer product SBUs while the other was composed of 1287 industrial product SBUs. Following the precedent established by Robinson and Fornell (1985), Parry and Bass (1990) utilized an econometric model with five simultaneous equations to capture the impact of pioneer advantage on market share, relative product quality, relative product-line breadth, relative price, and relative direct cost. A major finding of this research was that a stronger order-of-entry advantage was noted in more concentrated or oligopolistic markets. In both the consumer as well as industrial samples, these researchers found that the presence of effective entry barriers (as represented by relative degree of concentration) had a substantial influence on pioneer advantage. Pioneer coefficients in concentrated consumer-product and industrial-product industries were found to be positive ($B = 3.28$ and $B = 2.22$), while their counterparts in fragmented industries were negative ($B = -8.57$ and $B = -7.97$). Confirmation of the Robinson and Fornell (1985) and Robinson (1988) findings regarding end user purchase amounts in both consumer as well as industrial markets was also presented. Pioneers in concentrated consumer markets where the average retail purchase amount was less than \$10.00 were found to experience an incremental share benefit of 4.55 share points. Concentrated industrial products pioneers were found to benefit as the amount of the purchase price increased, with the mean purchase amount resulting in an average share benefit of 7.07 for the pioneer.

Noting the range of variation around the average market share value of first movers, Lambkin (1992) sought to expand upon her earlier findings regarding the role of structure and

strategy in explaining the nature and magnitude of first mover advantage. Corroborating earlier work in this research stream (Robinson and Fornell 1985; Robinson 1988; Lambkin 1988), Lambkin found that pioneers enjoyed a substantial market share advantage over early followers as well as later entrants:

“This sample yields a similar result, with pioneers displaying significantly higher mean levels of market share and profitability than either early followers or late entrants.” (p. 10)

Regressing the order-of-entry variable against market share also revealed a robust relationship ($R^2 = 0.09$, $p < 0.000$), which again can be compared in strength to the relationship between market share and return on investment ($R^2 = 0.13$) cited by Buzzell and Gale (1987). Drawing upon the barriers-to-entry literature which characterizes explanations of pioneer advantage (Lieberman and Montgomery 1988), Lambkin developed a series of hypotheses which systematically tested the association between successful pioneering and variables such as production scale advantages, broader product lines, access to greater corporate resources, superior product quality, intellectual property rights, lower direct costs, and participation in more concentrated industries. Noting the strong relationships between first mover advantage and relative product quality as well as relative product line breadth, Lambkin sought to confirm the findings of earlier researchers (Robinson and Fornell 1985; Robinson 1988). Against this background, Lambkin evaluated differences among successful, average, and unsuccessful pioneers on the aforementioned dimensions through the SPI4 PIMS database with a sample of 2746 firms. Analysis of variance findings found statistically significant support at the 1% level

for the role of production scale advantages, relative product quality, and customer support services in determining the magnitude of pioneer advantage. For instance, the average relative product quality of successful pioneers was measured at 13.5 versus 0.7 for unsuccessful pioneers. The average relative customer service level of high market share pioneers was quantified at 3.7 as opposed to 3.3 for low market share pioneers. Production scale advantage as defined by the capacity/market ratio was 68.5 for successful pioneers versus 14.5 for less successful pioneers. Successful as opposed to less successful pioneers were also significantly characterized at the 1% level by more intensive investment in advertising (3.0 : 2.5), promotion (3.1 : 2.6), and personal selling (3.2 : 2.9). Although analysis of variance indicated that successful pioneers were more likely to benefit from patent protection, this finding was only significant at the 10% level, confirming earlier research results (Robinson and Fornell 1985) which indicated a weaker relationship between first mover advantage and patent protection. Only minor distinctions in the degree of pioneer success were noted between consumer and industrial markets, again confirming the findings of Robinson and Fornell (1985) and Robinson (1988). Lambkin's (1992) conclusion that extensive variation in performance existed in pioneering and that market share outcome for pioneering firms was closely related to production scale and marketing advantages provides an empirical background from which to evaluate the research skeptical of first mover advantage such as Golder and Tellis (1993) as well as Schnaars (1995).

While supporting evidence for the linkage between order of entry and market share performance has been repeatedly established within the PIMS database (Robinson and Fornell 1985; Robinson 1988; Lambkin 1988), only a few studies have sought to

examine the relationship between order of entry and long-term financial performance. The effect of order of entry on long-term profitability in the form of return on investment (ROI) was an explicit research objective of the DeCastro and Chrisman (1995) study. Additionally, De Castro and Chrisman (1995) sought to incorporate the generic strategy literature (Porter 1980) into their investigation of order-of-entry effects within the PIMS SPI4 database. While noting the relationship between order of entry and functional policy decisions such as the broadened product lines relative to competition found by Robinson and Fornell 1985), De Castro and Chrisman (1995) focused their research effort on strategic decisions at the business unit level. As described by Porter (1980), the two primary routes to sustainable competitive advantage at the strategic level consist of cost leadership and differentiation. Furthermore, Porter (1980) articulated the concept that the strategic options of cost leadership and product differentiation were largely mutually exclusive and that firms which attempted to pursue both strategic avenues simultaneously risk a “stuck in the middle” outcome which is unsustainable from a strategic perspective. De Castro and Chrisman (1995) utilized ANOVA techniques, followed by Scheffe’s multiple comparison to evaluate their data. Although no statistically significant differences in ROI were found between pioneers which adopted the differentiation strategy and those which pursued cost leadership, a significantly greater number of pioneers chose to compete based upon differentiation ($p < 0.001$), a finding which supports theory (Lieberman and Montgomery 1988; Kerin, Varadarajan, and Peterson 1992). The theoretical converse, that followers were more likely to choose to compete based upon cost leadership, was not supported. This finding supports the evidence from several earlier studies (Robinson and Fornell 1985; Robinson 1988) which suggested that

the implementation of a cost leadership strategy for followers might be problematic.

Drawing their findings from a sample of 599 strategic business units, these researchers were able to conclude that:

“Results indicate that both order of entry and competitive strategy had significant main effects on the financial performance (ROI) of the firms studied...This suggests that firms may gain a long-lasting advantage from their timing of entry...Results also indicate that the manner in which firms align resources to exploit environmental opportunities is important too.” (p. 174)

Nevertheless, it should be noted that the main effect of competitive strategy upon financial performance ($F = 13.9, p = 0.000$) was greater than the main effect of order of entry on the same dependent variable ($F = 7.7, p < 0.006$), suggesting again the contingency theory of first mover advantage articulated by Kerin, Varadarajan, and Peterson (1992).

Although PIMS-based studies dominate the cross-sectional empirical literature on first mover advantage, other cross-sectional data bases have been used to examine the effects of order of entry upon market share performance. The earliest of these research efforts and one of the first comprehensive studies of first mover advantage was conducted by Urban, Carter, Gaskin, and Mucha (1986). Additionally, this investigation may be differentiated from the work of Lambkin (1988; 1992) and Robinson and Fornell (1985) through its focus on order-of-entry effects at the brand rather than the SBU level. Their research focus was built upon the ASSESSOR database, a pre-test market assessment procedure specifically designed for frequently purchased brands of consumer products. Their sample included 129 major brands across 36 distinct product categories. Pioneers were well-established with an average of 25

years in the marketplace. Within each category, 300 mall-intercept respondents were interviewed in an effort to determine evoked set, brand preferences, brand purchases, and ratings of selected brands on product attribute scales. The program was able to estimate market share based upon recent brand purchase while simultaneously projecting a perceptual map based upon preference and rating data. Noting that absolute market share is a variable dependent in part upon the number of competing brands within a category, Urban, Carter, Gaskin, and Mucha (1986) defined the dependent variable as market share relative to the market leader. Employing a log linear multiple regression methodology, this study utilized order of entry, lag between entry, advertising, and positioning as independent variables. The parameter estimates of these variables were found to be significant at the 1% level. A major conclusion of this research study was that market positioning ($B = 0.57$) and advertising ($B = 0.44$) contributed to market share more so than order of entry ($B = -0.21$), foreshadowing the later synthetic conceptualizations of first mover advantage (Kerin, Varadarajan, and Peterson 1992). However, as has been noted in a recent retrospective on first mover advantage by Robinson, Kalyanaram, and Urban (1994), if positioning quality and advertising spending were held constant, the n th entrant's share relative to the pioneer would be equal to 1 divided by the square root of its order of entry as can be seen in the following table (Table 2).

**Table 2: Order of Market Entry and Market Share
Share Relative to Market Share Forecasts (%)**

<u>Entry Order</u>	<u>Pioneering Brand</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>
First	1.00	100.0					
Second	0.71	58.5	41.5				
Third	0.58	43.6	31.0	25.4			
Fourth	0.51	35.7	25.4	20.8	18.1		
Fifth	0.45	30.8	21.9	17.9	15.5	13.9	
Sixth	0.41	27.3	19.4	15.9	13.8	12.4	11.2

Source: Urban, Carter, Gaskin, and Mucha (1986); Robinson, Kalyanaram, and Urban (1994)

Consequently, the findings of this study (Urban, Carter, Gaskin, and Mucha 1986) established order of entry as a significant explanatory variable for relative market share:

“The results of our analysis imply a significant market share penalty for later entrants...(while) firms aiming at developing pioneering brands should be encouraged by the availability of a long-run market share reward for their innovation. Although the pioneer’s share does decrease as each new firm enters, the pioneer retains a share differential.” (p. 655)

Building upon the work of Urban, Carter, Gaskin, and Mucha (1986), Kalyanaram and Urban (1992) also focused on the effects of order of entry across a sample of frequently purchased consumer products and extended this previous research on at least three dimensions. First, a cross-sectional as well as time series database was used to examine the

dynamic effects of order of entry rather than the cross-sectional ASSESOR data used in the Urban, Carter, Gaskin, and Mucha (1986) study. Secondly, the 1992 study incorporated some of the behavioral dimensions of first mover advantage suggested by Carpenter and Nakamoto among others discussed in a subsequent section of this literature review. Specifically, the study examined the effects of order of entry on trial penetration and repeat purchase behavior based upon BEHAVIORSCAN consumer panel respondents. The third aspect of this study which differentiated it from previous efforts was its use of universal product code (UPC) scanner data, allowing a direct analysis of price, promotion, and distribution effects as opposed to the self-reported and relative data from PIMS-based studies. The Kalyanaram and Urban (1992) sample consisted of 18 brand entrants across eight consumer products categories over a time period of 69 weeks. The categories included: tartar control toothpaste, high-fiber cereal, microwave popcorn, frozen orange juice, wine coolers, frozen pineapple juice, gel toothpaste, and ibuprofen pain relievers. Three equations were involved in the model development: market share, trial penetration, and repeat purchase behavior. The first of these equations, market share, was formulated to express the effects of order of entry, distribution, price, promotion, advertising, and, through a dummy variable, product quality. All marketing variables were modeled as the multiplicative effects expressed as a ratio of the pioneer's level for the variable. Both the trial penetration and repeat purchase models were constructed in an analogous manner. In an analysis specific to these latter two models, order-of-entry penalties for both trial and repeat purchase were found when all other variables were held constant. Highly robust results were obtained for all three models ($R^2 = 0.905$ for the market share model) and a significant order-of-entry effect ($B = -0.396, p < 0.01$) was observed:

“Substantial share rewards are granted by the market for early entry. Late entrants should expect lower shares unless they market their products more aggressively or have better quality...Our work provides evidence of order effects on share and both trial and repeat purchasing and supports several of the behavioral theories...” (pp. 246-247)

Similar in tone to the aforementioned work of Urban, Carter, Gaskin, and Mucha (1986) as well as Kalyanaram and Urban (1992), an additional investigation of first mover advantage at the brand rather than the SBU level was conducted by Kalyanaram and Wittink (1994). Noting that conceptual arguments for pioneer advantage at the economic and behavioral level were unlikely to be uniformly appropriate for all product categories, this study focused on the accommodation of increasing amounts of heterogeneity in the marketing variables' effects. An additional focal point was the accommodation of heterogeneity between product categories with regard to the order-of-entry variable. To this end, comparability across product categories was facilitated through the use of market share and marketing variables relative to those of the first entrant. Consistent with the two aforementioned studies, a multiplicative model was specified with the following independent variables: order of entry, time between entry, price, promotion, and distribution. Following the example established by Kalyanaram and Urban (1992), a sample was obtained from the BEHAVIORSCAN database for five consumer product categories: tartar control toothpaste, high-fiber cereal, frozen juices, wine coolers, and ibuprofen pain relievers. Statistically significant support at the $p < 0.01$ level was found for order-of-entry effects for all of the product categories with the

exception of ibuprofen ($p < 0.10$). The specific results were as follows: tartar control toothpaste ($B = -1.52$), high-fiber cereal ($B = -1.09$), frozen drinks ($B = -1.09$), wine coolers ($B = -0.40$), and ibuprofen pain relievers ($B = -0.77$). A similar pattern of support was found for the time-between-entry variable. This heterogeneity of entry effects across product categories which had been hypothesized to have highly similar distribution and consumer behavior patterns introduced a disturbing question to order-of-entry research: Why? In their discussion of these results, Kalyanaram and Urban (1992) suggested that high levels of comparative advertising in the ibuprofen market focused consumer attention away from pioneer advantage to competition based upon price. Nevertheless, the findings of this study, taken as a whole, lent additional support to the first mover advantage proposition.

The heterogeneity of entry effects noted by Kalyanaram and Urban (1992) led directly to Kerin, Kalyanaram, and Howard's (1996) study of the role product hierarchy and brand strategy play in the formation of first mover advantage. Their consideration of the question: Why do some pioneer products experience a more significant order-of-entry effect than do others involved a return to the BEHAVIORSCAN data which formed the basis of the earlier Kalyanaram and Urban (1992) study. Three facets of the Kerin, Kalyanaram, and Howard's (1996) study distinguish it from previous research in first mover advantage. First, order-of-entry effects were modeled as brand trial penetration rather than the more generally-used measure of market share. The adoption of trial penetration as a surrogate for first mover advantage was justified on the basis that trial, accompanied by a favorable consumption experience, is instrumental in the formation of positive attitudes toward the brand. According to Engel, Blackwell, and Miniard (1995),

this favorable attitude may, in turn, lead to an ongoing pattern of repeat purchase of the brand and consequently form a basis for first mover advantage. The second differentiating aspect of this research was its examination of the differential order-of-entry effects which result from pioneering a new product class or new product form. Noting that product class represents a higher position than product form in hierarchy theory, Kerin, Kalyanaram, and Howard (1996) hypothesized that first entrants within a product class would be more likely to assume first mover advantage than did first entrants within a product form. This hypothesis was based upon the competitive strategy literature (Lawless and Fisher 1990) which suggested that innovation based upon product function is more likely to result in sustainable competitive advantage than innovation based upon product form. In addition, behavioral research into consideration set formation (Kardes, Kalyanaram, Chandrashekar, and Dornoff 1993) was also employed in the theoretical underpinnings of this hypothesis. The third differentiating factor in this research was its consideration of the role of brand extensions versus the use of new brands in the formation of order-of-entry effects. Consistent with previous research (Kalyanaram and Urban 1992), a multiplicative model was developed which assumed that product hierarchy and brand strategy played no role in the formation of first mover advantage. Three additional models were then created to explore the effects of product hierarchy, brand strategy, and a combination of the two factors on the dependent variable. The respective unadjusted R^2 for the four models were: 0.85, 0.91, 0.92, and 0.96, strongly supporting the contention that greater insight into order-of-entry effects may be achieved through the consideration of brand strategy and product hierarchy. The hypothesis that the first mover advantage effect was greater for pioneers in a new product class was strongly supported ($t = 59.2, p = 0.001$) as was the hypothesis that order-of-entry effects

would be greater for pioneers adopting a brand extension strategy ($t = 24.0, p = 0.001$).

The conclusions of this study shed insight into the findings of the earlier Kalyanaram and Urban (1992) research:

“In other words, greater explanatory power was evident as the amount of heterogeneity allowed for in the model increased...Notably, order-of-entry effects were more pronounced for product class than product form pioneering...(and) this study also illustrates the important role brand strategy plays in achieving order-of-entry advantage.” (pp. 31-32)

In a larger sense, the Kerin, Kalyanaram, and Howard (1996) study also provided evidence in support of a contingency-based theory of pioneer advantage through its demonstration that the magnitude of order-of-entry effects on trial penetration is dependent upon whether the pioneer enters a new product class or product form and also on whether or not a brand extension strategy is implemented.

Considered in its totality, empirical research is highly supportive of first mover advantage. Significant indications of a long-term order-of-entry effect upon market share have been noted across a wide variety of industry-specific studies ranging from Bond and Lean's (1977) investigation of pharmaceutical products to Green, Barclay, and Ryans (1995) analysis of business word processing software applications. Examinations of specific industries have been conducted representing industrial products (Mitchell 1989; 1991), consumer products (Whitten 1979), and services (Mascharenhas 1991). Although the research methodologies which have been employed have grown increasingly sophisticated over the last two decades, the results have been highly consistent. Over the course of 20 years of research within specific industries consistent support has been found for the first mover hypothesis: that, on average, there is a negative relationship between order of

market entry and long-term market share. This longitudinal research is buttressed by the findings from the cross-sectional research. From the earliest published work (Robinson and Fornell 1985) based upon the PIMS database to the most recent research (Kerin, Kalyanaram, and Howard 1996) employing the BEHAVIORSCAN data, statistically significant support has been found for first mover advantage. In their distillation of the findings of order-of-entry research, Kalyanaram, Robinson, and Urban (1995) defined the characteristics of an established empirical generalization as one in which consistent support across multiple studies utilizing multiple databases has been found. In their judgment, the empirical evidence for first mover advantage is such that it has qualified as an established empirical generalization. Nevertheless, the issue of pioneer advantage has provoked its share of skeptics, as will be discussed in the following section.

Criticisms and Limitations Regarding Pioneer Advantage

The weaknesses in the empirical argument for first mover advantage can be approached from several perspectives. The persuasiveness of the PIMS-based research on FMA suggests that the problems within this area be presented first. Interestingly, both proponents and critics of pioneer advantage contributed to identifying the limitations of the PIMS-based research stream. While some of these counter-arguments are drawn from the inherent limitations of PIMS-based research, others are specific to the question of first mover advantage.

As suggested earlier, one of the significant problems encountered in evaluating

evidence for first mover advantage based upon PIMS-based studies is the definitional problem. The PIMS definition of FMA is both broad and self-reported as it appears in a reproduction of the actual questionnaire (Kerin, Mahajan, and Varadarajan 1990):

At the time your business first entered the served market, it was viewed as:

- 1. ...one of the pioneers**
- 2. ...an early follower**
- 3. ...a later entrant**

The implication of this PIMS definition is that a first mover may or may not have been first. Indeed, Buzzell and Gale (1987) found that over half of the reporting firms in the PIMS database classified themselves as pioneers, including several cases in which competitors within the same product category identified themselves as pioneers. Butressing this point of contention is the finding by Srinivasan (1988) in which he reported that 60% to 72% of PIMS businesses competing in various four-digit SIC categories considered themselves pioneers. According to Kerin, Varadarajan, and Peterson (1992), this ambiguity surrounding the PIMS definition of pioneer undercuts the validity of the underlying PIMS sample as an appropriate means of studying first mover advantage. A second consideration that can be drawn from the PIMS survey instrument is the possibility of self-perception bias problems. Golder and Tellis (1993) strongly emphasized the shortcomings of the self-reported PIMS data: “...Such self-reported data by single informants present a potential measurement problem. Respondents, especially if newer employees, may not be well informed about the order of market entry, especially of older products that have existed for decades. Self-perception bias may lead respondents in dominant but later entering firms to classify themselves as pioneers” (p. 158).

From a methodological perspective, the operationalization of order of entry as a dichotomous or even trichotomous variable presents an additional problem. Order of entry is an ordinal event in which there are first, second, third, and *n*th entries. According to Szymanski, Troy, and Bharadwaj (1995), the dichotomization of such a continuous predictor may lead to a loss of captured variance and a significant distortion in the estimate of association.

A third consideration is the survivor problem. The PIMS database contains only the successful survivors, who may or may not have been the first to pioneer a product. Firms which pioneered a product and subsequently failed are not included in the PIMS sample, leading to a potentially overstated advantage for FMA which might be quite substantial (Robinson and Fornell 1985; Schnaars 1994). As several researchers have noted (Robinson and Fornell 1985; Kerin, Varadarajan, and Peterson 1992), this component of selection bias is somewhat offset by the absence of unsuccessful later entrants who had also withdrawn from the market at the time of the census. An additional set-off to the issue of survivor bias is the possibility that *successful* pioneers may choose to exit a market as the level of competitive rivalry increases, profit margins decline, and potentially more attractive markets arise elsewhere. As Kerin, Varadarajan, and Peterson (1992) have commented, the withdrawal of such a successful pioneer would downwardly bias measurement of the order-of-entry effect. What emerges from an analysis of PIMS data then is the performance of surviving pioneers relative to surviving later entrants. A second perspective on the survivor issue emerged from an analysis of first mover advantage conducted with Iowa newspapers (Glazer 1985). In this longitudinal study examining all daily newspapers published within the state over a period of 140

years, the first entrant within a *successful* market was found to possess a statistically significant advantage at the 5% level over later entrants in terms of survivorship. That is, within successful markets, the rate of survivorship of pioneers exceeded that of later entrants. However, when *all* markets were considered, no significant difference was found between the survivorship rates of first entrants and later entrants. Other industry-specific evidence offers conflicting insights regarding the issue of survivorship. While Lieberman's (1989) work with chemical products in 39 markets confirms Glazer's (1985) finding that there was no significant difference between the rate of survivorship among pioneers and later entrants, Mitchell's (1991) study of the medical diagnostic imaging industry indicated that pioneers experienced significantly lower rates of survival than did later entrants. In his study of the semi-submersible oil drilling industry, Mascarenhas (1992) found that analyzing only surviving entrants at a point in time overestimated the relationship between pioneering and market share. In their consideration of this issue, Kalyanaram, Robinson, and Urban (1995) postulated as an empirical generalization that order of market entry is not related to long-term survival while conceding that further research into this question is required. Consequently, while preliminary evidence indicates that survivorship does not necessarily cloud the findings of PIMS-based empirical research, this criticism must be kept in mind (1996) when considering the implications of these studies.

A fourth criticism of PIMS-based research advocating the robustness of first mover advantage can be termed the Fortune 500 problem. The PIMS database consists of more than 3000 SBUs largely drawn from major North American and European corporations and may not be representative of those found in many competitive situations. As a result, a significant problem exists in extrapolating the findings of this

research to the situation of a small entrepreneurial firm (Schnaars 1994). In his examination of pioneer advantage within industrial products manufacturers, Robinson (1988) cautioned against the generalizability of the PIMS-based findings based upon the composition of the database. Because the PIMS database is largely dominated by major corporations with strong marketing skills and financial resources, the conclusion that pioneering is generally translated into long-run market share advantage does not necessarily apply when an entrepreneurial pioneer is challenged by an established corporate power from a related market.

Additional questions regarding the validity of the PIMS-based support for first mover advantage have been raised by Moore, Boulding, and Goodstein (1991). Based in part upon the earlier conceptual insights of Lieberman and Montgomery (1988), the essence of their argument suggests that pioneering be treated as an endogenous variable. According to this perspective, the firm will consider its internal strengths, evaluate the potential environmental opportunity, and form its expectations about performance outcomes and the manner in which this outcome depends upon entry timing. Those firms which possess internal strengths such as technological foresight, market research prowess, or resourceful new product development skills, or simple good fortune have the opportunity to create first mover opportunities. Furthermore, there is a potentially interactive quality to these variables (MacMillan 1984). Hence, the endogenous interpretation of first mover advantage holds that firm skills and resources as well as random chance in the form of luck create market place advantage rather than simply the effect of the timing of the firm's entry into the market. Because all firms do not possess the same set of managerial skills and resources, the endogeneity issue is of considerable

importance. Consequently, the issue addressed by Moore, Boulding, and Goodstein (1991) regarding order-of-entry research is that the overall magnitude of first mover advantage may be confounded with differences in the skills and resources of the firm. Exogenous models of first mover advantage such as those utilized by Robinson and Fornell (1985) and Robinson (1988) did not control for the effects of the aforementioned managerial skills in estimating pioneer advantage and may have systematically overestimated the effects of order of entry for firms which do not possess the relevant skill base. Through their use of Hausman's specification test, the conclusions of the Moore, Boulding, and Goodstein (1991) study suggest that statistically significant bias may be present in the exogenous pioneering model. Their assessment of the effect of pioneering on market share revealed substantive differences between the exogenous pioneering estimates and their endogenous pioneering estimates ($F = 1.88, p < 0.05$). The implications of this study and the similar conclusions of Vanhonacker and Day (1987) presage the contingency approach to first mover advantage suggested by Kerin, Varadarajan, and Peterson (1992) which is discussed in greater detail in the following pages.

Approaching the issue of the endogenous versus exogenous nature of first mover advantages from a different perspective, Robinson, Fornell, and Sullivan (1992) examined 171 start-up ventures from the PIMS STR2 database. Following the conceptual arguments advanced by Lieberman and Montgomery (1988), Robinson, Fornell, and Sullivan (1992) sought to determine if market pioneers enjoyed long-term market share advantages simply because these firms were inherently more competitively endowed. Their interpretation of the endogenous versus exogenous issue conceptualized two basic,

yet conflicting, patterns of explanation: absolute advantage and comparative advantage. The thesis of the absolute advantage explanation for first mover advantage holds that the very act of market pioneering yields superior economic profits and that inherently stronger firms will employ this knowledge to enter the market before their weaker competitors. Following this line of argument to its logical conclusion would imply that cross-sectional studies of order of entry systematically overestimate first mover advantage by confounding firm skills and resources with the act of pioneering. On the other hand, comparative advantage follows Abell's (1978) notion of a "strategic window" and stipulates that the resource requirements for competitive advantage within an industry may shift radically with market evolution. Consequently, market entry - whether earlier or later - will occur when a strategic fit arises between corporate resources and market opportunities. Robinson, Fornell, and Sullivan (1992) hypothesized that market pioneers are different from, but not necessarily stronger than, later entrants. Their interest in this issue stems from their earlier cross-sectional research into order of entry (Robinson and Fornell 1985; Robinson 1988) which held that market pioneers developed competitive advantage by moving first rather than the converse. Robinson, Fornell, and Sullivan (1992) employed a multinomial logit model to estimate order-of-entry probabilities for a given set of skills: research and development, manufacturing, finance and marketing. Contrary to conceptually-based expectations of pioneering (Lieberman and Montgomery 1988), first movers were characterized by relatively high levels of financial expertise but were *not* associated with relative expertise in research and development. Although Robinson, Fornell, and Sullivan (1992) did concede that this finding may have been confounded due to the possibility of measurement error, they did find that research

and development intensity as measured against sales was strongly associated with first movers. Increased corporate marketing skills were found to increase the probability of late entry, confirming the results of earlier empirical research (Robinson and Fornell 1985; Robinson 1988; Lambkin 1988). Overall, the differences in skill profiles among pioneers, early followers, and late entrants found in this study lends support to the comparative advantage or exogenous explanation of first mover advantage.

Moderating the conclusions advanced by Moore, Boulding, and Goodstein (1991) as well as Vanhonacker and Day (1987) is the recent work of Murthi, Srinivasan, and Kalyanaram (1996). Distinguishing this study from other work in the order-of-entry research stream are proposed mechanisms which are designed to systematically control for observed and unobserved managerial skills when determining the nature of first mover advantage from an exogenous as well as an endogenous perspective. Utilizing a sample in excess of 2000 firms drawn from the PIMS data base and following the model suggested by Robinson and Fornell (1985), these researchers included two additional explanatory variables in order to capture the effects of the firm's resources and skills: relative marketing efficiency (RME) and relative production efficiency (RPE). Data envelopment analysis, a technique developed in the operations research literature (Charnes, Cooper, and Rhodes 1978) was utilized in measuring these two mechanisms. Consistent with the literature on management performance assessment (Bonoma and Clark 1988), these two measures of marketing and manufacturing efficiency can be interpreted as surrogates for managerial skill. The results of this study found that pioneers have higher relative marketing efficiency scores (RME = 0.947) than do late entrants (RME = 0.926), suggesting that pioneers use their marketing resources better

than late entrants. On the other hand, late entrants were found to enjoy an advantage regarding relative production efficiency (RPE = 0.72 for late entrants vs. RPE = 0.698). While Murthi, Srinivasan, and Kalyanaram (1996) concluded that these measures were unlikely to completely reflect the effect of a factor as subjective as managerial skill, their finding that pioneer advantage remained robust after controlling for management talent reinforces the empirical argument for first mover advantage when the issue is addressed from the classic exogenous perspective:

“With or without heterogeneity, we observe that pioneering advantage is strong...Even with a detailed specification for observed and unobserved managerial resources, we find the effects of pioneering to be enduring.” (p. 335)

Extending this research finding, these researchers then considered the question of whether first mover advantage is measurable when considered as an endogenous phenomenon. By estimating a recursive model with pioneering specified as a function of skills as well as corporate funding of research and development, Murthi, Srinivasan, and Kalyanaram (1996) found that the order-of-entry effect remained robust despite the endogenous orientation of their model. Specifically, pioneers were found to enjoy a market share advantage, on average, in excess of 11% over later entrants. The conclusions that may be drawn from this study are that after controlling for managerial skill and even accepting an endogenous interpretation of pioneering, first mover advantages persist and are robust.

Other criticisms of the PIMS-based research finding for first mover advantage are largely based on the inherent limitations of the PIMS database. The first and most serious of these considerations is the heterogeneity problem. With its pooling of data

from a cross-sectional sample of disparate industries, the PIMS database represents a classic example of heterogeneity, calling into question the validity of reported relationships in general and specifically between entry order and market share (Kerin, Varadarajan, and Peterson 1992). While researchers have attempted to address the heterogeneity problem by limiting their samples to mature consumer goods industries (Robinson and Fornell 1985;) or mature industrial products manufacturers (Robinson 1988; De Castro and Chrisman 1995), the heterogeneity issue remains a significant problem for order-of-entry research built upon the PIMS database (Parry and Bass 1990).

The second broad criticism of PIMS-derived research is the freedom that PIMS respondents have in defining their business units and arena of competition. This self-definition may lead to problems in comparing the level of aggregation of different SBUs, product lines, and brands (Buzzell and Gale 1986) as well as opening the possibility that pioneers may have defined their market shares relative to substitutes from other industries and thus have understated their relative advantage (Miller, Gartner, and Wilson 1994). Moderating these criticisms of first mover advantage based upon PIMS research are other empirical studies based on cross-sectional data such as ASSESSOR (Urban, Carter, Gaskin, and Mucha 1986; Brown and Lattin 1994; Huff and Robinson 1994) and BEHAVIORSCAN (Kerin, Kalyanaram, and Howard 1996). The BEHAVIORSCAN database, for instance, is composed of both survivors as well as non-survivors, thus circumventing the survivorship line of criticism encountered with the PIMS-based research.

Criticism of empirically-based surveys other than PIMS, ASSESSOR, and BEHAVIORSCAN center on the use of student samples and the limitations of samples

drawn from idiosyncratic industries such as pharmaceuticals and cigarettes (Kerin, Varadarajan, and Peterson 1992; Schnaars 1994). Two of the four studies specifically examining behavioral explanations for first mover advantage utilized MBA students, limiting the generalizability of these findings (Carpenter and Nakamoto 1989; Kardes and Kalyanaram 1992). The generalizability of findings based upon the pharmaceutical industry (Bond and Lean 1977) has been implicitly criticized by Schnaars (1994) on the basis that patent protection is not as strong in other industries in which the original patent may be circumvented. The Whitten analysis of first entry advantage in the cigarette industry has been criticized on the basis that cigarettes represent a highly idiosyncratic industry as well as the contention that price competition was not a significant factor during the time period of the study (Schnaars 1994). Similarly, Flaherty's (1984) field study of the semiconductor industry and the presence of evidence supportive of first mover advantage has been perceived as limited in its generalizability due to the close working relationships between vendors and their client design engineers in this particular industry (Kerin, Varadarajan, and Peterson 1992). The close working relationships characteristic of the semiconductor industry have been interpreted as limiting qualified sources of supply, creating switching costs, and raising the barriers to entry for later entrants, thus effectively creating an advantage for pioneers. A similar line of criticism has been invoked with regard to Mascarenhas' study of pioneer advantage in the context of the semi-submersible oil-drilling market (Robinson, Kalyanaram, and Urban 1994). Nevertheless, critiques of generalizability based upon switching costs are diminished in their appropriateness when the generalization is extended only to industrial buying behavior. As Porter (1980) has noted, switching costs are prevalent in the industrial marketplace.

An additional source of criticism of both cross-sectional as well as industry-specific empirical research into order of entry is the timing of measurement issue. As both Brown and Lattin (1994) as well as Huff and Robinson (1984) have reported, pioneer advantage may be eroded away over long periods of time as additional firms enter the industry. More narrowly, the central question posed by these researchers deals with the effect on market share of market lead-time; in other words: Does advantage accrue to the pioneer if subsequent firms enter later rather than earlier? Previous research (Robinson and Fornell 1988; Lambkin 1992) had modeled time-in-market through the use of categorical variables which attempted to distinguish between new pioneers and veteran pioneers. Brown and Lattin (1994) hypothesized that pioneering advantage is composed of two distinct effects: an order-of-entry effect and a time-in-market effect. Working with the ASSESOR cross-sectional data from Urban, Carter, Gaskin, and Mucha (1986), Brown and Lattin (1994) first modeled pioneering advantage as a pure function of order of entry with no consideration given to time-in-market. The regression analysis results indicated a highly significant order-of-entry effect ($B = -0.41$, $t = -5.88$, $p < 0.01$) for this single variable model, demonstrating that pioneers possessed a distinct advantage in terms of market share. However, when a time-in-market variable was included in the regression equation, the order-of-entry coefficient lost statistical significance ($B = -0.12$, $t = -1.26$) while the time-in-market coefficient was highly significant ($B = 0.256$, $t = 3.08$, $p < 0.01$). Noting this change in significance, Brown and Lattin (1994) were able to suggest that with the passage of time some portion of order-of-entry advantage was competed away. In a second, related study, Brown and Lattin (1994) examined the role of time-in-market utilizing roll-out data from a recently developed segment of the pet

food market. Again, the results of the regression analysis yielded an order-of-entry term that was not statistically significant ($B = -0.039$, $t = -0.36$) while the time-in-market term was significant at the 1% level ($B = 0.806$, $t = 3.27$). Also working within this research stream, Huff and Robinson (1994) examined the impact of lead-time on pioneer market share advantage. This study built upon the Brown and Lattin (1994) research by examining two periods: the time period in which there is only the pioneer and the subsequent stage in which there is a competitive rivalry between two or more firms within the same product category. Again, the ASSESOR cross-sectional data from the Urban, Carter, Gaskin, and Mucha (1986) study were used. The findings of this research suggest that increasing the lead-time of the pioneer tended to result in larger first mover market share. However, as with the Brown and Lattin (1994) study, this competitive advantage was often gradually eroded over a 10 to 20 year period. Consequently, the robustness and, indeed, the direction of first mover advantage may depend on when market share is measured (Kerin, Varadarajan, and Peterson 1992), an insight which is supported by game theory research.

Working from Levitt's (1966) observation that a firm can reduce its risk by deferring entry until a pioneer has proven the market, Chatterjee and Sugita (1990) employed a game theoretic model to examine the options of two potential entrants when confronted with uncertainty in terms of demand. These researchers worked from a duopolistic scenario in which equal access to all of the factors of production was assumed, posing an exercise in which the first mover hypothesis might be examined in its pure form. Four potential entrance situations were considered: both could enter simultaneously, both could defer entrance indefinitely, or one or the other could enter

while the second firm delayed. First mover advantage was incorporated by considering the effect of order of entry upon profit rates with the pioneer enjoying a brief period of monopolistic profit before the second entry. The probability of entrance by at least one firm was found to be high under several conditions, including when demand uncertainty was low, when expected profitability was high, and when the first mover perceived its competitor as passive in terms of new product introduction. In essence, the equilibrium strategies generated in this game theory model depend upon the trade-off between the expected profitability of the new product and the uncertainty of its very profitability. Concurring with the earlier game theoretic results of Wernerfelt and Kamani (1987), entrance was also found to be likely in those situations in which first mover advantages were particularly strong. However, in the presence of a competitor perceived as an aggressive imitator, Chatterjee and Sugita (1990) found that the innovative firm will be more conservative in its behavior and its inclination to introduce new products will be diminished.

The game theoretic literature has also raised additional concerns regarding the first mover hypothesis. Fershtman, Mahajan, and Muller (1990) examined the issue in a duopolistic setting utilizing a differential game theory model which tested the relationship between order of entry and convergent market share at equilibrium. Contrary to the first mover theory advanced in the empirical literature (Robinson and Fornell 1985), Fershtman, Mahajan, and Muller (1990) found that mere order of entry had no direct effect on market share in the long run. Rather, these researchers found that the significance of order of entry is its “effect on production costs, advertising costs, price elasticity and, by implication, quality, distribution and breadth of line.” (p. 913) The conclusions reached in this exercise were that initial

first mover advantages were eroded through the diffusion of technological innovation and that the distinct possibility exists that the production costs of the first mover and the later entrant will converge as equilibrium is reached.

Another area of concern raised by several researchers (Lieberman and Montgomery 1988; Kerin, Varadarajan, and Peterson 1992) revolved around the appropriateness of market share as a proxy for first mover advantage. Few empirical studies known to this researcher have attempted to measure the relationship between order of entry and overall firm profitability whether articulated as return on investment or return on assets. Prominent exceptions to this generalization are Lambkin (1988) and De Castro and Chrisman (1995). According to the vast majority of all contemporary theories of the firm, profit maximization rather than market share leadership should be the appropriate objective of the corporation (Lieberman and Montgomery 1988). Following this line of reasoning, these researchers have suggested that some measure of profitability other than market share may be the more appropriate measure of first mover advantage. Unfortunately for the empirical researcher, measures of disaggregate profit are seldom obtainable, and those which are available have been shown to possess certain limitations (Anderson and Paine 1978). Consequently, empirical measurement of first mover advantage has historically used market share as a surrogate for profitability, citing the linkages between market share and profitability drawn from the PIMS database (Buzzell and Gale 1987). However, in those studies which have attempted to examine the impact of order of entry on profitability as measured by return on investment, first mover advantages appear to hold. As can be seen in the accompanying chart (Table 3), Lambkin (1988) found statistically significant evidence at the 1% level to support the higher

profitability (ROI) of pioneers relative to early followers and late entrants in the PIMS SPI4 database. Supporting her findings are the results published by De Castro and Chrisman (1995), which are also illustrated in Table 3. While this last study did not distinguish between early followers and later entrants in an attempt to better balance the pioneer-oriented PIMS sample, it does illustrate statistically significant differences in the long-term financial performance of pioneers and non-pioneers.

Table 3: Order of Market Entry and ROI

	<u>Pioneers</u>	<u>Overall Followers</u>	
		<u>Early Followers</u>	<u>Late Entrants</u>
Lambkin (1988)	20.65	17.58	9.22
De Castro and Chrisman (1995)	25.29	19.65	

As one of the earliest and most vocal detractors of first mover advantage, Schnaars (1986; 1994) collected a series of contrary case studies in which the original market pioneer is supplanted by later and usually larger market entrants. The more recent and substantial of these works was *Managing Imitation Strategies: How Later Entrants Seize Market Share from Pioneers* (Schnaars 1994). The central thesis of this collection attempted to challenge the prevailing paradigm, that early entrance into emerging markets results, on average, in superior market share performance. While the vast majority of research supportive of first mover advantage has been drawn from empirical studies, Schnaars (1994) constructed his counter-argument based upon 28 case studies. Drawing

upon the business histories of industries as diverse as automated teller machines, light beer, credit cards, microwave ovens, commercial jet aircraft, and computer software, Schnaars (1994) repeatedly demonstrated that pioneering is not a normative business strategy and that distinct competitive advantages may be inherited by later entrants. From those competitive advantages available to market followers, Schnaars identified three generic imitation strategies by which later entrants may overcome first mover advantage. The first of these is cost leadership based upon the free rider effect, in which the later entrant “piggybacks” upon the research and market development investment of the first mover and exploits the cost differential between the groundbreaking expenses of the pioneer and its imitation by a later market entrant. The second generic strategy proposed by Schnaars involves leapfrogging the technological standards of the market pioneer and changing the perceived ideal attributes of the product while encumbering the pioneer with a clearly outdated standard. A third generic imitation strategy is based upon market power, and suggests the use of superior advertising, branding, and distribution skills and resources to overcome the first mover advantage of the market pioneer. Although Schnaars’ (1994) study has been criticized for its unbalanced approach and reliance upon a purely convenience sample (Morgan 1995), his contradictory case studies have enriched the debate on first mover advantage. However, despite the detailed presentation of contrary examples, Schnaars’ (1994) study offers no systematic empirical evidence in resolution of the order-of-entry question.

Other research within this contrarian vein has also focused on the potential problems which confront the technologically-oriented pioneer (Olleros 1986). In examining pioneership within the U.S. electronics industry as well as the personal computer

industry, Olleros presented examples in which the technological pioneer was overtaken by later market entrants. In describing the vulnerability of the technological pioneer, Olleros cited high market uncertainty and technological uncertainty as the principle disadvantages of the market pioneer. While Olleros, like Schnaars (1986; 1994), limits his analysis to pioneership within particular industries, the fundamental criticism of this line of inquiry is that it remains anecdotal and limited due to its lack of statistical rigor (Morgan 1995).

Although somewhat ancillary to the question of first mover advantage, the Lilien and Yoon (1990) study of a cross-sectional sample of French industrial product manufacturers is notable in two regards. First, this study represents one of the very few investigations of first mover advantage in an international setting. Secondly and foremost, this investigation found support for an increased level of success for the third through fifth entries within a product category, a finding which is highly contrary to the vast majority of studies in first mover advantage. Importantly, Lilien and Yoon (1990) defined the dependent variable of success in a very different manner than previous research (Robinson and Fornell 1985; Robinson 1988; Lambkin 1988; 1992). These earlier researchers had modeled the dependent variable as market share or ROI. In their study, Lilien and Yoon (1990) defined the success of a new product through a dichotomous variable: whether or not the firm which developed the product extended the new introduction into a full-blown product group. This unique interpretation of the dependent variable was justified by these researchers on the basis that short-term projections of performance such as market share or ROI may overlook the long-term and potentially synergistic impact of the firm's involvement in a new product category or market. The database in this study consisted of 91 new industrial products from 52 French firms randomly drawn from a national directory in proportion to their relative importance for

French industrial policy. The independent variables were modeled as order of entry, stage of the product life cycle, and product development time. The hypothesis of interest, that the likelihood of success for the first and second entrants (e.g. pioneers) was lower than that for the third and fourth entrants was not rejected ($X^2 = 4.9827$; $p = 0.0129$). Lilien and Yoon (1990) based this hypothesis on the imitation strategy advanced by Levitt (1966) and Schnaars (1986). While not specifically addressing the question of first mover advantage, the findings from this study raise questions regarding the efficacy of pioneering research and development.

Noting that methodological problems underlie much of the empirical research into pioneer advantage, Golder and Tellis (1993) investigated the impact of FMA on long-run market performance through the use of historical analysis. Two key differences between their methodology and other empirical studies were the inclusion of non-surviving pioneers and the use of historical archival research. Drawing from numerous industry histories including video recorders, color television, light beer, diet cola, frozen food, and dandruff shampoo, these researchers repeatedly illustrated a pattern in which the technological and often the market pioneer is surpassed by later entrants. The virtue of this historical approach to research is the use of contemporaneous objective sources such as *Business Week* and *Advertising Age*, a research method which substantially eliminates the self-perception bias cited earlier. Within their overall sample Golder and Tellis found a mean market share for pioneers of 10%, substantially less than the empirical studies cited earlier (Robinson and Fornell 1985; Urban *et al.* 1986; Robinson 1985). Later researchers (Robinson, Kalyanaram, and Urban 1994) have noted the nonrandom nature of the Golder and Tellis sample, which is composed of three distinct subsamples. The first of these sequential samples consisted of consumer goods drawn from 17 recently developed

product categories. The second sample consisted of seven product categories each of which contained a widely acknowledged market pioneer. The third sample frame was nonrandomly drawn from the *Advertising Age* list of 25 long-term market leaders cited earlier, deleting those older product categories where identification of the pioneer would be problematic. Anticipating this criticism of their convenience sample, Golder and Tellis noted that their sample was chosen in a manner which deliberately biased the results towards a finding favorable of pioneer advantage. A second area of concern regarding the Golder and Tellis work is that their product pioneer is not required to reach a competitive level of commercialization in order to earn the pioneer designation. As has been noted by Robinson, Kalyanaram, and Urban (1994), more conventional definitions of pioneering incorporate the concept of significant market entrance and when this more widely accepted definition of pioneership is applied to the Golder and Tellis sample, first mover advantages are more easily identified. Product category definitions comprise a third area of concern regarding the Golder and Tellis research design. By way of illustration, Rosenbloom and Cusumano (1986) conceptualized the VCR industry as two distinct categories - the consumer and professional markets - while Golder and Tellis (1993) interpreted the market as a single category with Ampex as its pioneer. However, in their analysis of the technological development of the mass market VCR, Rosenbloom and Cusumano (1987) presented compelling evidence for distinct differences in the underlying technologies between the commercial and home products. Their analysis (Rosenbloom and Cusumano 1986) credited JVC and Sony with the development of the mass market VCR product category and, thus, their identification as pioneers. Nevertheless, the Golder and Tellis (1993) study does identify high market share with the early market leader (though often not the product pioneer), corroborating in part the PIMS-based research

when the definitional problem of early entrance is considered. A second consideration of the Golder and Tellis research on first mover advantage is that long-term competitive advantage may be a function of positional advantage, managerial skill, and product-market contingencies, an insight which has been extensively developed by the contingency extension school (Kerin, Varadarajan, and Peterson 1992; Green, Barclay, and Ryans 1995; Szymanski, Troy, and Bharadwaj 1995).

As has been detailed across the previous discussion, criticism of empirical order-of-entry research has focused on sample validity issues (Kerin, Varadarajan, and Peterson 1992), methodological issues (Moore, Boulding, and Goodstein 1991), and measurement issues (Szymanski, Troy, and Bharadwaj 1995). Prominent among the concerns regarding sampling frames are the inherent limitations of the PIMS database and the idiosyncratic nature of several of the industry-specific samples, such as the pharmaceutical and cigarette industries. Nevertheless, as Robinson, Kalyanaram, and Urban (1994) have emphasized, multiple research efforts across multiple databases utilizing diverse methodological tools have largely produced convergent results supportive of the first mover hypothesis. Concerns regarding measurement issues have largely focused on the survivor problem and the timing of measurement question. While preliminary evidence from research into the survivor problem does not necessarily challenge the findings of PIMS-based research, this limitation must be kept in mind when evaluating substantial portions of order-of-entry research. Research specific to the timing of measurement issue (Brown and Lattin 1994; Huff and Robinson) has largely concluded that initial market share advantages, while persistent, may be diminished with the passage of time. However, this limitation to the first mover hypothesis has never

been explicitly contested by order-of-entry research (Robinson, Kalyanaram, and Urban 1994). Criticism of order-of-entry research based upon methodological grounds has ranged from problems regarding definitional issues (Golding and Tellis 1993) to model specification concerns (Moore, Boulding, and Goodstein 1991). Finally, the contrarian examples of first mover *disadvantage* collected by Schnaars (1994) as well as others (Golding and Tellis 1993) illustrate the multidimensional nature of the order-of-entry question and point towards the contemporary appraisals offered by contingency theory (Kerin, Varadarajan, and Peterson 1992).

Taken as a whole, the industry-specific and cross-sectional empirical evidence which has been presented forms an impressive body of literature which is supportive of the first mover hypothesis. Combined with the conceptual explanations derived from the economic barriers-to-entry literature and recent work in the behavioral origins of pioneer advantage, these arguments form a strong grounding for first mover advantage. Nevertheless, the contrary evidence presented earlier is difficult to dismiss. The emergence of the contingency extension understanding of first mover advantage offers an opportunity to synthesize the internal tension between the advocates and critics of pioneering advantage.

The Contingency Extension

Recent years have seen a wholesale revolution in the understanding of first mover advantage. As has been suggested in some of the industry-specific as well as cross-sectional empirical research in first mover advantage, pioneering represents a

complex marketing phenomenon with a number of underlying conceptual explanations. The contradictory evidence also suggests that pioneering is not a normative strategic decision universally conducive to superior performance for all firms. This reappraisal of first mover advantage can be referred to as the contingency extension and is a perspective that stresses the importance of managerial skills, firm resources, and product-market characteristics in determining the extent of pioneer advantage. According to this perspective, order of entry creates a *necessary* though not *sufficient* condition for the development of first mover advantage. Contingency theory holds that the act of pioneering offers the possibility, though not the certainty, of creating an order-of-entry competitive advantage based upon four distinct categories of factors. Drawing upon the Kerin, Varadarajan, and Peterson (1992) analysis, the first of these four groups of conceptual explanations for first mover pre-eminence may be termed economic factors and includes scale and experience economies as well as marketing cost asymmetries. The second category of explanation is comprised of pre-emption factors including cost asymmetries in factor inputs and differentiation advantages through spatial pre-emption. The third conceptual basis for first mover advantage may be termed technological factors, which enable the pioneer to differentiate itself from its competitors through product and/or process innovations which are difficult or illegal to imitate. The fourth basis for first mover advantage may be classified as behavioral factors such as switching costs, category prototypicality, reputational effects, the role of the first mover in industry standardization and social coordination, and consumption experience asymmetries. Drawing broadly from the marketing entry strategy literature as well as the findings of order-of-entry research, Kerin, Varadarajan, and Peterson (1992) argued that each of

these four categories of conceptual explanation may be affected by moderators. In a given competitive situation, the presence or absence of these moderators may affect the magnitude and direction of pioneer advantage. The criticality of economic factors, for instance, may be moderated by the level of demand uncertainty, the presence of scope economies for the first mover as well as other industry participants, the response time of later competitors, and the advertising intensiveness of the industry. Pre-emption factors may be moderated, to a certain extent, by product characteristics such as technological complexity or the necessity of channel members inventorying significant levels of spare parts. Technological factors supportive of pioneer advantage, such as patents and trade secrets, may be ameliorated by the inefficiency of intellectual property rights legislation or enforcement. The behavioral basis for first mover advantage may be moderated by the nature of the good or the buyer's investment in cospecialized assets. In addition, the contingency perspective incorporated the conceptualization of later entrant advantage articulated by Levitt (1965) as well as Schnaars (1986; 1994). The conceptual framework offered by Kerin, Varadarajan, and Peterson (1992) synthesized this new understanding of first mover advantage in the following terms:

“The overall magnitude of first mover advantage is the composite effect of a multiplicity of factors. The degree of fit between the environmental opportunity and the first mover's skills and resources, the firm's ability to capitalize on potential sources of first mover advantage, the moderating effects of product-market contingencies on the factors underlying the positional advantages of the first mover, and the competitive strategies of later entrants combine to form the overall magnitude of a first mover advantage.” (p. 46)

In a recently published attempt to empirically verify the contingency framework put

forward by Kerin, Varadarajan, and Peterson (1992), Szymanski, Troy, and Bharadwaj (1995) conducted a meta-analysis of the empirical order-of-entry research. Noting that the qualitative contingency framework hypothesized the existence of moderating variables, Szymanski, Troy, and Bharadwaj (1995) identified 16 studies which reported a total of 64 unstandardized regression coefficients representing the effect of order of entry on market share. The resulting database was confined to third-factors which had been coded across at least 20% of the performance models and formed the basis for the meta-analysis. The conceptual framework which guided the meta-analysis attempted to demonstrate that estimates of pioneering advantage may be influenced by three factors. The first of these may be described as the omission of relevant predictor variables such as marketing expenditures, product line breadth, and relative price. Secondly, this research model also held that sample characteristics such as industrial versus consumer markets and the level of aggregation may influence estimation of first mover advantage. Thirdly, Szymanski, Troy, and Bharadwaj (1995) conceptualized the estimate of pioneer advantage as influenced by measurement factors such as the operationalization of order-of-entry terms (ordinal versus dichotomous) as well as the operationalization of market share itself (relative versus absolute). Regarding methodology, two analyses were performed on this sample. The first of these was univariate and focused upon the range and central tendency of the pioneering effects. The second was multivariate and utilized analysis of covariance. The univariate results reported that the sample-size weighted mean was positive ($U = 4.21$) and statistically significant ($p = 0.05$). These results support the central tendency of a 4.21% long-term pioneer advantage in market share across the 16 empirical studies. A significant finding of the multivariate aspect of the meta-analysis was that the extent of *estimated* first mover advantage is moderated by all three influence

sources: potentially-omitted predictor variables, sample characteristics, and measurement factors. Two model specification errors were seen as critical: whether marketing expenditure level was included as an independent variable and whether relative breadth of product line was included in the model. The exclusion of these two variables led to a consistent overestimation of the influence of order of entry upon market share and a potential overstatement of first mover advantage. Regarding sample characteristics, Szymanski, Troy, and Bharadwaj (1995) found that estimates of first mover advantage were higher when entire business units rather than individual brands were examined, potentially illustrating the role of scope economies in manufacturing and marketing. In terms of measurement factors, whether order of entry was operationalized by actual order or treated as a pioneer/later entrant dichotomy had a significant effect on the estimate of pioneer market share. Estimates of first mover advantage were potentially overstated when the dichotomous measure was used, a finding often alluded to in order-of-entry research. However, when a trichotomous measure - pioneer/early follower/late entrant - was used to capture order of entry, the mean pioneering effects were comparable to those captured as actual order of entry ($p = 0.05$). Taken as a whole, the results of this project strongly support the empirical evidence in support of the first mover hypothesis: that order of entry does create a significant and positive direct effect on market share. However, the magnitude of this order-of-entry advantage may be overestimated through the omission of other predictor variables as well as measurement factors and sample characteristics. In addition, the findings of this meta-analysis lend support to the conclusions of the contingency extension framework: that while order of entry does create a significant and positive direct effect on market share, the interaction effects of order of entry, firm resources, and product-market contingencies are much more robust than pioneer advantage taken by itself.

This examination of the debate surrounding the validity of first mover advantage has attempted to present the issue in terms of thesis, antithesis, and synthesis. The incorporation of managerial skills, firm resources, and product-market contingencies suggested in the synthetic conceptualization offered by Kerin, Varadarajan, and Peterson (1992) and empirically demonstrated in the recent meta-analysis of pioneer advantage by Szymanski, Troy, and Bharadwaj (1995) support a broadened understanding of pioneer advantage and its complexity. Although the purest expression of the first mover hypothesis has been modified to fit the contingency framework, the broadened concept of first mover advantage has gained increasing currency within the marketing strategy research community (Robinson, Kalyanaram, and Urban 1994). Noting the consistency of empirical results over nearly two decades of investigation, recent retrospectives of order-of-entry research have described the negative relationship between order of entry and market share as an established empirical generalization (Robinson, Kalyanaram, and Urban 1994; Kalyanaram, Robinson, and Urban 1995). While the robustness of pioneer advantage has received growing recognition, the underlying mechanisms which are responsible for creating this form of competitive advantage remain only partially understood and are of great interest to strategy research (Kalyanaram, Robinson, and Urban 1995). The literature describing the conceptual basis of first mover advantage is subsequently presented for the reader.

Conceptual Explanations of First Mover Advantage

While thus far the question of first mover advantage has largely been considered an empirical issue, a considerable body of literature exists which has been used to justify the existence of pioneer advantage from a theoretical perspective. Conceptual explanations of first mover advantage largely fall into two classes of argumentation: those based upon economic barriers to entry and those grounded in theoretical consumer behavior. While the approach based upon economic barriers to entry largely originated in the industrial organizational economics literature (Bain 1958; Porter 1980; 1985), the behavioral explanations for first mover advantage can be traced to the consumer economics work of Schmalensee (1982). Scholars from strategic management as well as marketing strategy have borrowed from both explanatory categories in an attempt to isolate the mechanisms of first mover advantage (Lieberman and Montgomery 1988; Kerin, Varadarajan, and Peterson 1992). Contemporary considerations of order-of-entry research have noted the extent of this body of theoretical literature as well as the difficulty in empirically linking individual aspects to pioneer market share performance (Kalyanaram, Robinson, and Urban 1995). Consequently, the immediate purpose of this discussion is to suggest the range of potential conceptual explanations for the first mover hypothesis, beginning with the economic barriers-to-entry literature.

Economic-Analytic Sources of First Mover Advantage

Drawing upon the extensive work of Porter (1980; 1985), conceptual explanations of first mover advantage based upon the economic barriers-to-entry literature may be

categorized into four general areas: the cost advantages of incumbents, technological and other government-enforced barriers, the information asymmetry of the incumbent, and customer switching costs. Conceptual explanations of pioneer advantage based upon the cost advantages of incumbents are grounded on two closely related concepts. The first of these can be termed the experience effects argument. According to this perspective, first popularized by the Boston Consulting Group, unit production costs fall with cumulative output. As the first market entrant, the pioneer has the distinct advantage of beginning its slide down the experience curve before its competitors begin their production. A sustainable cost advantage can be generated for the pioneer if this experience curve can be kept proprietary (Lieberman and Montgomery 1988). Closely associated with the experience effects argument, a potentially powerful second explanation of first mover advantage lies in the concept of scale. The temporary monopoly afforded by entering a market first allows the firm an opportunity to achieve critical mass and make efficient plant and market investment decisions, leading to direct cost savings relative to later competitors in the areas of manufacturing, marketing, and distribution (Robinson and Fornell 1985). Game theory treatments of the incumbent's cost advantage have also been used to justify its importance as a barrier to entry. As demonstrated by Dixit (1980), the theory of large-scale entry into an industry is made complicated by its game-theoretic aspects. In his treatment of this problem, the pioneering firm can alter the competitive outcome to its advantage by changing the initial conditions through a deterrent investment in scale. This irrevocable investment in capability allows the first mover to alter its marginal cost curve, and thereby change the post-entry equilibrium to a situation in which it possesses limited leadership.

A second category within the barriers-to-entry literature is technological leadership. First movers can gain sustainable competitive advantage if the technology underlying the product or process can be patented or maintained as a trade secret (Lieberman and Montgomery 1988). Although the criticality of patent protection as a potential barrier to entry is cited in several treatments of first mover advantage (MacMillan 1982; Lieberman and Montgomery 1988; Lambkin 1992), empirical evidence seems to point in the opposite direction (Robinson and Fornell 1985; Robinson 1988). In examining this potential source of pioneer advantage across two samples, these researchers (Robinson and Fornell 1985; Robinson 1988) found that approximately one in five pioneers claimed a competitive benefit from their product patents and trade secrets. Analysis of variance between the market performance of those pioneers who attested to the benefits of patent protection and those who did not led to statistically insignificant results. Although Lambkin's (1992) investigation of this issue found that successful pioneers were more likely to benefit from patent protection than less successful pioneers, her results were only significant at the 10% level, leading to the conclusion that patents have only a marginal influence on competitive outcomes. The relative power of product patents and trade secrets as a source of first mover advantage is also undercut by findings from the economics literature (Mansfield 1977; 1985) which found that, with the possible exception of the pharmaceutical industry, patents conferred only a weak form of protection. In their examination of the innovation versus imitation issue, Baldwin and Childs (1969) refined an economic model which demonstrated that assuming equal development and production costs, a fast second imitator may outgain the pioneering innovator. The findings of this model were then iterated through four scenarios: Cournot,

von Stackelberg, minimaxing, and joint-profit maximizing by duopolists. In the first of these iterations, the Cournot scenario, each firm formulates its own strategy on the assumption that its rival will not change its strategy in response. Equilibrium is unstable because if both adopt the imitator strategy, each will realize that it could improve its own situation through innovation. When both become innovators, each will decide to return to a strategy of imitation, and so on. In the von Stackelberg leadership scenario, neither firm would innovate as long as both participants sought the leadership position. As for the minimaxing scenario, Baldwin and Childs (1969) hypothesized that both would become innovators if, and only if, both participants were minimaxers and positive profits could be earned by both. In the joint-profit maximization scenario, it was found that each firm might carry out some share of innovation, but only if some form of collusion were possible. Baldwin and Childs (1969) hypothesized that the superior profit potential of the fast second strategy would serve to diminish innovative efforts as the two competing rivals shifted strategies, a finding they thought not to be in the best interests of society. Additionally, Baldwin and Childs (1969) suggested that the profitability of imitation decreases as the number of firms competing within the category increases.

A second governmentally-sanctioned barrier to entry is represented by brand names and trademarks. New entrants to an industry are denied the benefits of those brand names which have been created by pioneering firms, creating a potential barrier to entry. The classic exposition of this scenario, *FTC vs. Borden, Inc. (ReaLemon)*, illustrates the power of brand names in the creation of first mover advantage. Golden Crown, a competitive brand which had entered the processed lemon juice market ten years after the first mover, alleged that ReaLemon had unfairly excluded it from the market through premium branding differentiation and predatory pricing strategies. While the courts

eventually sustained the FTC findings of monopolization, the issue of brand name was resolved in favor of ReaLemon on the basis that the firm had created and sustained a consumer-valued information stock through its trademark (Krouse 1984). Leadership is not confined to technological or marketing dimensions but can take the form of organizational innovation, such as the brand management system pioneered by P&G in the 1930s. Although this aspect of innovation is not, strictly speaking, patentable, research has suggested that organizational innovation is often slow to diffuse and can lead to a sustainable competitive advantage (Lieberman and Montgomery 1988; Reed and DeFillippi 1990; Williams 1992).

Asymmetric information has been seen as a potential source of pioneer advantage as first movers may gain access to market information leading to the pre-emption of strategic inputs (Lieberman and Montgomery 1988) or other aspects of the value chain (MacMillan 1983). This pre-emption of strategic inputs may take many forms such as the cornering of the market for scarce resources, production equipment, or skilled labor. Assets such as prime retail location and the rights to natural resources may be garnered by the pioneer, thus setting the stage for long-run competitive advantage (Porter 1980). The pre-emption of distribution channels follows a similar line of argument. The pioneer has the opportunity to design the distribution channel for the product, hence monopolizing distribution avenues such as shelf space and wholesalers (Lieberman and Montgomery 1988). The concept of pre-emption can also be applied to psychological positioning: The first mover can select the most attractive psychological market niches, limiting the options of later entrants (Ries and Trout 1986). This psychological positioning of the business in relation to its competitors is not confined to customers, but as noted by MacMillan (1983) may be extended to downstream channels

unions (Delta's "we are a family of professionals"). Closely related to the concept of market positioning is the question of product quality positioning. Pioneers initially define product quality superiority and subsequently can develop advantages in the form of broader product lines (Robinson and Fornell 1985). The skillful positioning of the product as the dominant design may be translated into long-term competitive advantage for the first mover (MacMillan 1983). Differences in marginal advertising effects have also been cited as a potential explanation for first mover advantage (Comanor and Wilson 1967). Late entrants may have to "shout louder to be heard" and increase their cost function by additional spending on advertising. Following the course of the aforementioned arguments based upon pre-emption, market pioneers have the opportunity to define and seize for themselves the most persuasive advertising message as well as the most effective advertising channels (Robinson and Fornell 1985).

Switching costs have been proposed as a major conceptual explanation of first mover advantage. The first mover has the opportunity to define the product category and its specifications, which later entrants may be forced to follow. These product standards imposed by the pioneer become switching costs for the pioneer's customers (Porter 1980). Switching costs may be intentionally created by the seller - as in frequent flier programs. Or switching costs for the buyer may arise from the financial and non-financial investments of the initial transaction. A third category of switching costs comes about from the supplier-specific learning that the buyer must undertake.

The relative power of these economically-based barriers to entry was evaluated by Karakaya and Stahl (1989) in their analysis of executive perceptions of barriers to entry. Based upon a sample of 137 executives drawn from the membership of the American

Marketing Association, these researchers measured executive perceptions through a simulated decision-making exercise and modeled the relative weight of these perceptions through an orthogonal transformation. The results of this investigation strongly support the power of the aforementioned barriers to entry at the 0.01 level. Karakaya and Stahl (1989) also considered whether there were differences in the importance of these barriers to entry in the market entry decision. This hypothesis was tested first through the use of MANOVA on the relative weights associated with the six distinct barriers. The presence of differences was indicated in the results of the MANOVA (Wilks' lambda = 0.870; $F = 5.746, p < 0.01$). Duncan's multiple range test was then utilized to compare the relative weights of market entry barriers across the four market entry decisions. For late entrants in consumer markets, the most significant perceived barrier to entry was found to lie in the incumbent's cost advantages (MRW = 0.217), which is to say the experience effects curve and the effects of scale. Similar results were obtained for late entrants into industrial markets (MRW = 0.238). The perceived effect of switching costs was found to have more importance for industrial (MRW = 0.149) rather than consumer markets (MRW = 0.130), validating the earlier empirical work of Robinson (1988) and theoretical perspectives of Porter (1980). This difference was found to be statistically significant at the $p < 0.01$ level. Although Karakaya and Stahl's (1989) research represented a simulation rather than historical data, the findings of this survey strongly support the contention of order-of-entry researchers (Lieberman and Montgomery 1988; Kerin, Varadarajan, and Peterson 1992) that economically-based barriers to entry are effective in shaping first mover advantage.

As has been discussed, the potency of economic barriers to entry has been

articulated from theoretical (Porter 1980), empirical (Robinson and Fornell 1985), and perceptual (Karakaya and Stahl 1989) perspectives. This multidisciplinary approach has been augmented by increasing attention from marketing research into behavioral sources of entry advantage. Reversing the declining relevance of marketing strategy research noted by Day (1992), behavioral approaches to first mover advantage in particular have been cited for their general value in the organizational economics literature: “we are in debt to business scholars for illuminating the relevant relationships” (Scherer 1994, p. 173). In addition, cross-disciplinary citations may be found in the management literature (Cahill 1996).

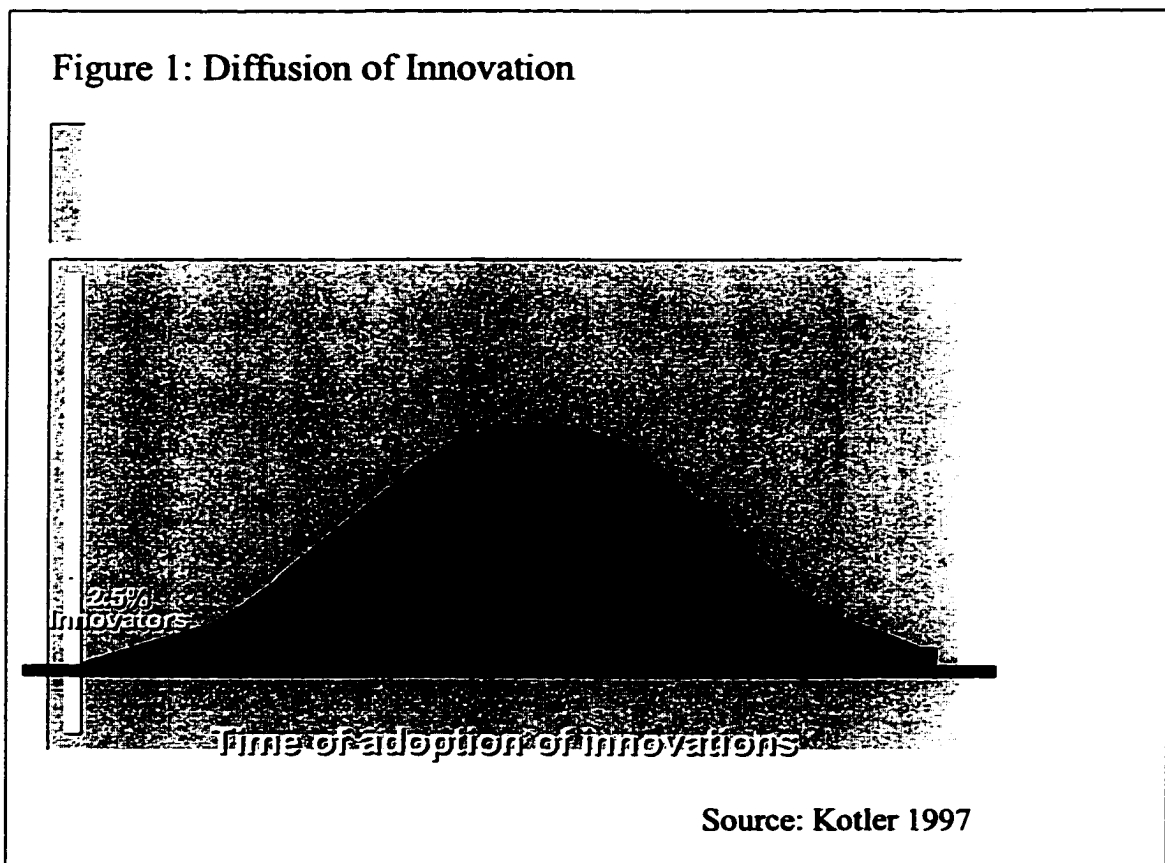
Behavioral Sources of First Mover Advantage

While the diversity and sheer number of conceptual explanations for first mover advantage based upon economic barriers to entry is impressive, the behavioral explanations for this market phenomenon are equally persuasive. Behavioral biases towards the first mover have been noted in the literature as early as Bain’s (1956) examination of barriers to entry:

“...the advantage to established sellers ensuing from buyer preferences for their as opposed to potential entrant products is on average larger and more frequent in occurrence at large values than any other barrier to entry.” (p. 216)

The first of these consumer-oriented explanations for the long-run competitive advantage of the initial market entrant lies in the application of the diffusion of innovation research pioneered by Rogers (1971). The distribution of potential customers for a product has

been described as a normal distribution composed of innovators, early adopters, early majority, late majority, and laggards (Fig. 1).



A fundamental premise of diffusion of innovation research is that the eventual penetration of the population rests on the adoption of the product by the innovators - which represent 2.5% of the normally distributed population - and the early adopters - which represent an

additional 13.5% of the population (Engel, Blackwell, and Miniard 1995). From this perspective, the pioneer is often able to skim off the innovators and early adopters, creating a tide of brand loyalty which carries through the customer base and leaves later entrants with potential customers less predisposed to adopt new brands (Kerin, Varadarajan, and Peterson 1992). The criticality of this diffusion of innovation as a source of first mover advantage is also emphasized by Fershtman, Mahajan, and Muller (1990) in a piece otherwise critical of the first mover hypothesis:

“If, for example, consumers who are innovators adopt the durable product first, and they are few in number, the pioneer will enjoy the benefits that these innovators bring along, mainly their relatively high word-of-mouth coefficient. Latecomers will have to be content with less effective groups. These groups, such as early and late majority, are inferior in terms of their opinion leadership, social involvement, and other variables that all sum up to the word-of-mouth coefficient. This will certainly have a short-term effect, and it might have a long-term effect as well.” (p. 914)

A second conceptual source of first mover advantage originated in the consumer economics literature with Schmalensee (1982) and can be termed risk aversion. In his analysis of the rational consumer, Schmalensee hypothesized that if the consumer's initial purchase experience has met the satisfaction hurdle and if the consumer has no reason to believe that the quality of the brand is variable, the consumer will develop brand loyalty. Furthermore, this product knowledge and measure of satisfaction will create a barrier against later entrants. This adoption of the pioneer brand creates a level of perceived risk when considering the purchase of later entering brands (Schmalensee 1982) for which the consumer has imperfect information about product quality. If the quality of the product can only be determined through experience, the degree of perceived risk can be highly influential. In this seminal essay,

Schmalensee (1982) examined the process by which consumers evaluated sequentially entering brands of experience goods and developed preferences biased towards the first entrant:

“When consumers become convinced that the first brand in any product class performs satisfactorily, that brand becomes the standard against which subsequent entrants are rationally judged. It then becomes harder for later entrants to persuade consumers to invest in learning about their qualities than it was for the first brand... We have thus found a product differentiation advantage of early entry that has nothing to do with advertising or consumer irrationality.” (p.360)

Closely associated with the concept of risk aversion, the presence of search costs represents an additional source of pioneer advantage. The total costs involved in the purchase of a product are not all strictly financial - they include the investment of the consumer's time and effort in obtaining the good. Satisfactory experiences with the pioneer brand create loyalty towards the brand, as the rational consumer will attempt to minimize search costs (Schmalensee 1982). In a similar vein, Conrad (1983) confirmed the earlier conclusions advanced by Schmalensee: that the first brand in a market has a price advantage over imitative entrants because consumers have more information regarding its quality. Conrad's (1983) economic model suggested that this initial price advantage enables the established brand to enjoy an extended period market share advantage over its rivals leading to one of two equilibria: effective monopolization of the market by the first mover or a gradual diminishment of its market share over time as consumers on average become more willing to sample competitive products. According to this perspective, pioneer brand advantage based upon the cost of consumer information is affected by purchase frequency and the degree of

perceived risk as well as the experiential nature of the product.

A third conceptual explanation for pioneer advantage is predicated upon the role of learning in both the creation of brand loyalty as well as consumer preference formation. Although Schmalensee (1982) conceptualized brand loyalty as a function of risk aversion and the desire of the rational consumer to minimize search costs, other consumer economists have sought alternative explanations for brand loyalty. Gabszewicz, Pepall, and Thisse (1992) articulated a theory of brand loyalty based upon the switching costs of consumer learning and applied this model to the development of pioneer brand advantage. Restricting their model to an experiential good in which consumer learning is essential, such as a software application, Gabszewicz, Pepall, and Thisse (1992) found that the optimal pricing strategy of a first mover was a penetration price designed to build a large customer base. As competitive firms enter the market, the initial low price could be increased to represent the brand loyalty created by the learning differential advantage.

The role of learning has also been associated with the development of brand attribute preference formation and prototypicality. Based upon the quasi-experimental work of Carpenter and Nakamoto (1989), this concept argues that first movers have a high degree of control over the manner in which consumers evaluate the attributes of a new product, particularly for discontinuous innovations. Extensively cited in subsequent order-of-entry research, Carpenter and Nakamoto's (1989) "Consumer Preference Formation and Pioneering Advantage" has been honored with the 1994 William F. O'Dell Award. According to this model, purchase leads to learning and consumers begin to form their preference structure for the product category based on the brand attributes of

the pioneer. Pioneer advantage is formed based upon two distinct components. First, this pre-empting of the preference structure can lead to a durable competitive advantage because the pioneer has the opportunity to define the category. There are important implications for perceptual mapping in this shaping of the preference structure. Because the attributes of the pioneer product have influenced the preference structure of the consumer, the product positioning of the first mover may come to represent the ideal preference point (Carpenter and Nakamoto 1989). Secondly, these researchers argue that as a by-product of the learning process, the pioneer becomes strongly associated with the entire product category and becomes the standard by which later entrants are judged. This prototypicality may result in the competitive distinction of the first mover, insulating it from the price competition of later imitative products.

In order to empirically examine the effects of learning in preference formation, Carpenter and Nakamoto (1989) conducted an experiment involving 48 MBA students and their evaluations of hypothetical software brands with different attribute levels through multiple dimensional scaling and analysis of variance. By manipulating the order of entry of software brands for different groups of respondents, Carpenter and Nakamoto were able to demonstrate that pioneer brands enjoyed a larger preference share regardless of the brand characteristics ($t = 1.91; p < 0.05$). Furthermore, the results of this study suggested that when the ideal attribute combination is ambiguous, the ideal point shifts toward the position of the pioneer, regardless of its characteristics, supporting the notion of prototypicality and challenging the assumption that consumer preferences are fixed. A second series of experiments, again with MBA students but this time with brands of quilts, utilized conjoint analysis and analysis of variance to support the concept of first

mover advantage and its relationship with preference structure formation. Importantly, pioneering was found to be the only significant factor in predicting rank ($F = 20; p < 0.001$). The results of this study (Carpenter and Nakamoto 1989) suggested that experience with the pioneer has an important role in the formation of preferences for all brands and that the original brand is perceived as prototypical of the product category and close to the ideal preference point:

“We suggest that pioneering advantage, under certain conditions, depends importantly on biases in buyers’ preferences...the pioneer occupies a favorable perceptual position that is difficult to imitate and costly to compete against, yielding a powerful competitive advantage.” (p. 298)

Reflecting upon their earlier work, Carpenter and Nakamoto (1994) have strongly argued that the implications of this finding extend beyond the study of first mover advantage and have significance for competitive strategy in general:

“Before this project began, our thinking about competitive advantage paralleled work based in economics that implicitly makes very strong assumptions about consumer decision making and preferences. In particular, consumer preferences are taken as fixed and exogenous - not the outcome of competition but the determinant of it. This is reflected in the marketing concept in that marketing is seen largely as a process of discovery, identifying and meeting consumer needs. Our work suggests that consumer preferences are, at least in part, the *outcome* of competition...Thus, preferences for attributes evolve with consumer experience...and competition can be viewed as a race to shape the nature of consumer preferences.” (p. 571)

The information exposure sequence represents an additional potential source of first mover advantage. In this hypothesis, the first exposure to the brand whether through media channels or word-of-mouth creates a lasting competitive advantage because of the strength of

the product's novelty (Alpert and Kamins 1994). Kardes and Kalyanaram (1992) examined order-of-entry effects from the perspective of learning, memory, and judgment. These researchers developed a model of learning and memory as a function of sequential brand exposure, hypothesizing that differential learning as a function of order of entry would result in greater recall of pioneer features which were shared with later entrants and greater recall of pioneer features which were unique. In order to test these hypotheses, Kardes and Kalyanaram (1992) conducted a longitudinal experiment in which subjects were exposed to *Consumer Reports* attribute information for three different brands - brand A, brand B, and brand C. Pretest results verified the equivalency of brands A and B, and the relative superiority of brand C. Information pertaining to the first mover was disclosed in the first session, while the two later entrants were unveiled in a second session two weeks later. By examining the attribute preferences of 40 MBA students over three separate sessions, significant support ($F = 25.33, p < 0.001$) was demonstrated for first mover advantage and this advantage was found to increase over time ($F = 16.47, p < 0.001$) and with repeated exposures ($F = 3.23, p < 0.05$) - arguing for the role of learning in pioneer advantage. The results of this experiment indicated that order of entry influenced learning about products even when the amount of product information was held constant for successive brands. Greater recall for pioneer attributes - both shared ($F = 22.98, p < 0.001$) and unique ($F = 2.79, p < 0.07$) - was also noted, strengthening the potential involvement of learning and memory with first mover advantage through differential learning patterns predicated upon pioneer novelty. Not confining their research scope to the issues of learning and memory, Kardes and Kalyanaram (1992) also examined the issue of brand evaluation. Here, differential learning as a function of order of entry resulted, on average, in more favorable evaluations of the first mover as

opposed to later entrants ($F = 12.42, p < 0.001$). Strengthening their argument, Kardes and Kalyanaram (1992) were able to replicate the results while varying the order of entry from ABC to BAC and endowing C with superior attribute levels. However, when all three brands were presented simultaneously and the order-of-entry effect was eliminated, the preference structure changed in favor of brand C and its superior attribute levels. Considered together, the results of this research strongly suggest that pioneer status influences learning, which then affects attitudinal and preference judgment which in turn can be translated into first mover advantage (Kardes and Kalyanaram 1992).

Somewhat related to the theory of information exposure sequence, brand name recall has been cited as another behavioral justification of pioneer advantage (Alpert and Kamins 1994). In their experimental work with first mover advantage, Kardes and Kalyanaram (1992) found direct evidence of superior recall of pioneer brand attributes. Being first can often lead to an extremely strong association of the brand name with the product category. Jeep, Coke, Xerox, Kleenex, and Fed-Ex are classic cases where the brand name has come to represent the entire product category. Brand name recall and the limitations of the evoked set may block follower brands from consideration (Alpert and Kamins 1994). In an examination of brand name recall involving the Arkansas Household Research Panel, Alpert and Kamins (1995) found that consumers can retrieve the pioneer's brand name to a degree that is significantly higher than for other brands. In this study, product categories were sought in which the pioneer, after a period of market leadership, no longer dominated the market. Consequently, retrieval of the pioneer's brand name could not be completely attributed to current market share. Across the five product categories chosen in this study, the pioneer brand was retrieved more than any

other brand in three of these categories.

A further potential explanation for first mover advantage may lie in the serial positioning effect. Research into the serial positioning effect suggests that if a series of items is exposed to an individual, the item best remembered will be the first one. Alpert and Kamins (1994) noted that this effect has been recognized since the early twentieth century work of Eppinghaus found that the first in a series of nonsense words was best recalled. This enhanced recall effect, when extended to brands, suggests that the first brand that the consumer is exposed to is likely to be brought to mind when an evoked set is formed. These researchers also hypothesized that because the pioneer brand may be the only brand in the category for an extended period of time, it is likely that the serial positioning effect may be even stronger.

While Carpenter and Nakamoto (1989) as well as Kardes and Kalyanaram (1992) focused on the contribution of multiattribute evaluation processes to the creation of first mover advantage, Kardes, Kalyanaram, Chandrashekar, and Dornoff (1993) specifically examined the effects of pioneering on brand retrieval, consideration set composition, and consumer choice. In this research project, a within-subjects longitudinal experiment involving 115 MBA students was designed to simulate order of entry into a hypothetical market for low caloric chocolate. Hypothetical brand names were manipulated to control for prior knowledge effects and subjects were tested at periodic intervals in the learning process. Using a sequential logit model, these researchers found that the impact of pioneering was significant in all relevant stages of the decision model. That is, the pioneering brand outperformed followers in its inclusion in brand retrieval ($B = 3.065, p < 0.0001$), brand consideration ($B = 4.025, p < 0.01$), and brand choice ($B = 1.279, p < 0.05$), substantiating

the theoretical research in serial positioning and brand name recall in an experimental environment.

Another potential source of first mover advantage has been identified in the form of reputational effects. According to Porter (1985), "A firm that moves first may establish a reputation as the pioneer...which can produce long-term image benefits not available to others." Firms seeking to capture the benefits of reputational effects often feature pioneering in their advertising and promotion, such as the Chrysler claim that "we invented the minivan." It has been suggested that consumers seek to identify themselves by the products which they own (Sirgy 1982), and that this self-image enhancement forms a powerful source of first mover advantage. According to self-concept theory, individuals have a concept of the self which is founded on beliefs regarding an ideal version of the self. Empirical research has demonstrated that consumers are likely to purchase, *ceteris paribus*, brands which fit either their ideal or actual self-concept (Sirgy 1982). This stream of consumer behavior research holds that buyers seek to maximize self-image through association with the positive aspects of pioneer brands - their originality and innovativeness - rather than the negative connotations of imitators (Alpert and Kamins 1994).

Attitudinal Processes and First Mover Advantage

Three distinct and active research streams have recently emerged in the marketing literature which have examined psychological processes and their relationship to first mover advantage. While the potential roles of prototypicality as well as brand retrieval and consideration set formation in the formation of first mover advantage have been

discussed previously, attitudinal approaches to order-of-entry research have extended the research boundaries of the behavioral approach to first mover advantage and are subsequently discussed.

Noting the growing channel power of consumer goods retailers in general and grocery store chains in particular, Alpert, Kamins, and Graham (1992) examined the effect of order of entry upon reseller buyers' attitudes and beliefs. Utilizing the Fishbein and Ajzen (1975) multiattribute attitude model as a foundation for their investigation, Alpert, Kamins, and Graham (1992) hypothesized that reseller buyers held global attitudes which were more favorably disposed towards pioneering brands. By juxtaposing the Fishbein and Ajzen attitude model on the cognition/affect/conation paradigm of high involvement purchasing behavior (Engel, Blackwell, and Miniard 1995), this research project attempted to explain first mover advantage by tracing backwards from purchasing behavior to purchasing intentions to global brand attitude to beliefs regarding the brand. In addition to measures of global attitude, this research project sought to identify and measure determinant attributes which might explain why reseller buyers held different attitudes towards pioneers versus later entrants. Through a combination of literature review and focus groups, ten relevant attributes were identified. These, in turn, were tested against a sample of 145 food industry buyers. Utilizing analysis of variance techniques, the results of this survey revealed significant differences between pioneers and followers in terms of global attitude ($F = 282.1, p < 0.0001$) as well as multiattribute attitude ($F = 179.23, p < 0.0001$). Regarding the multiattribute attitude measures, the most significant perceptual measures explaining pioneer advantage were the failure of late entrants to meet unmet needs, generate shopping excitement, and

achieve eventual high sales volume. Through the use of structural equations modeling, a causal model was constructed which explicitly linked reseller buyer beliefs to global attitudes to purchase intentions. Consequently, the findings of this investigation strongly support the contention that reseller buyer screening of products may aid in the development of first mover advantage:

“Our major finding is that reseller preference for pioneer brands should be included among the sources of pioneer brand advantage. In an increasingly competitive economy, pioneer brand advantage is a source of long-term sustainable competitive advantage for companies...(and)...a source of increased consumer welfare through the emphasis on product innovation.” (p. 36)

Shifting their focus from reseller buyers to consumers, Alpert and Kamins (1995) expanded the domain of attitudinal research into the origins of first mover advantage through an empirical approach which paralleled the quasi-experimental work of Carpenter and Nakamoto (1989) as well as Kardes and Kalyanaram (1992). Working with a sample frame based upon the Arkansas Household Research Panel, Alpert and Kamins (1995) examined the cognitions, attitudes, and purchase histories of 560 households from a theoretical framework similar to their 1992 study of reseller buyers in which the Fishbein and Ajzen (1975) multiattribute attitude model was superimposed over the cognition/affect/conation paradigm of high involvement purchasing behavior (Engel, Blackwell, and Miniard 1995). In addition, this research study attempted to replicate the findings of Kardes, Kalyanaram, Chandrashekar, and Dornoff (1993) regarding the effect of order of entry upon brand recall and consideration set formation in an empirical setting. The results of this aspect of the study supported earlier experimental work by demonstrating that the pioneer brand was retrieved at a rate significantly higher than that of follower brands in four of five product classes despite the fact that the

pioneer no longer held major market share. Additionally, in a test of unaided recall the pioneer was identified by the consumer sample at a rate significantly greater than chance. In regard to the attitudinal aspect of this research project, findings found a statistically significant difference in measures of favorable global attitude for the pioneer over follower brands ($t = 3.94, p < 0.0001$). These results were replicated on 15 of the 16 measures of multiattribute attitude drawn from the *Marketing Scales Handbook* (Bruner and Hensel 1992). While there was no explicit test of the cognition/affect/conation linkage in this study, the implicit results point toward a causal relationship. Overall, the results of this investigation provided a convergent validity to earlier behavioral approaches to pioneer advantage and extended research into the origins of first mover advantage:

“Our findings strongly suggest that consumers have positive attitudes and positive perceptions toward pioneer brands...leading to positive behavioral intentions towards pioneer brands...These findings help explain the key managerial result that pioneer status can be of lasting benefit with consumers” (p. 42-43).

Working within this area of interest and building upon the previous examination of behaviorally-based conceptual explanations of pioneer advantage, the following discussions will trace two distinct, though related, research paths and clarify the research gap which is the subject of this dissertation. The first of these research paths outlines the literature which distinguishes industrial buying behavior from consumer behavior while the second discussion traces the use of multiattribute attitude models in the marketing literature.

Industrial Buying Behavior and First Mover Advantage

While attitudinal approaches to the origins of first mover advantage have been examined in the context of consumers (Alpert and Kamins 1995) as well as reseller buyers of consumer non-durables (Alpert, Kamins, and Graham 1992), a significant research gap exists in marketing's understanding of the effect of order of entry upon industrial buying behavior. To more clearly delineate this research domain, the following literature review focuses on the theoretical origins of industrial buying behavior and those distinct characteristics which divide consumer and industrial buying behavior. Kotler (1997) has characterized industrial buying behavior as those buyer-seller relationships which are involved in the acquisition of raw materials and assemblies that are subsequently converted into finished goods as well as the goods and services which are necessary for the operations of the firm. Indeed, the larger topic of industrial marketing is largely defined in the context of industrial buying behavior, which has its theoretical grounding in the work of Webster and Wind (1972), Sheth (1973), and Robinson, Faris, and Wind (1967).

In a seminal treatment of industrial buying behavior, Webster and Wind (1972) characterized the concept as "a decision-making process carried out by individuals, in interaction with other people, and in the context of a formal organization...influenced by budget, cost, and profit considerations" (p. 13). The central contribution of Webster and Wind (1972) to the industrial buying literature was the synthesis of the task and non-task approaches into a comprehensive general model of corporate purchasing (cf. Appendix: Figure II). These researchers conceptualized the process of industrial purchasing in terms of four classes of determining variables: individual, social, organizational, and

environmental factors. Webster and Wind (1972) identified both task and non-task elements within each of these broad classes of determining variables. The social, or interpersonal determinants of buying behavior are reflected in the group processes of the buying center, which includes all members of the organization involved in the purchasing decision. Webster and Wind (1972) perceived the ultimate buying decision in terms of the individual “at the center of the buying process, operating within the buying center that is in turn bounded by the formal organization which is likewise embedded in the influences of the broader environment” (p. 18).

A somewhat different approach to industrial buying behavior was suggested by Sheth (1973), and is patterned after his fundamental work in consumer buying behavior with Howard, *The Theory of Buyer Behavior* (1969). One of the central concepts of the Sheth model (cf. Appendix: Figure III) of organizational buying is the notion of perceived risk, which he defined as “the magnitude of adverse consequences felt by the decision maker if he makes a wrong choice, and the uncertainty under which he must decide” (p. 54). Sheth conceptualized industrial buying behavior in terms of three distinct aspects. The first of these embodies the psychological world of the individuals involved in the organizational buying decision. The second aspect of industrial buying behavior comprises the conditions which precipitate joint or individual decisions, including level of perceived risk, time pressure, and the degree of organizational centralization. The final component of this construct is represented by the process of joint decision-making and conflict resolution. Similar to Webster and Wind’s (1972) model of organizational purchasing, Sheth (1973) invoked the critical role of non-task, or situational variables in corporate purchasing: “...it is important to realize that not all industrial decisions are the

outcome of a systematic decision-making process” (p. 56). The Sheth (1973) model may be distinguished from the Webster and Wind (1972) model in its emphasis on product-specific and firm-specific factors such as level of perceived risk, time pressure, and the degree of organizational centralization.

A third major influence on contemporary research in business marketing was the taxonomy of purchasing situations developed by Robinson, Faris, and Wind in their classic text: *Industrial Buying and Creative Marketing* (1967). Originating in their observation of purchasing behaviors in two large firms, the Robinson, Faris, and Wind (RFW) framework depicted the organizational purchasing situation in terms of three relatively distinct categories, or “buyclasses”: the new task, the straight rebuy, and the modified rebuy. The new task (or new buy) purchasing situation can be characterized as the buying of a product or service for the first time or, more properly, the confronting of a corporate procurement problem for the first time. The new task situation involves high levels of perceived risk, maximum required search time, and high involvement on the part of the buying center. According to Robinson, Faris, and Wind (1967), the economic considerations of the purchasing decision are generally secondary to the solution of the larger problem in the new task buyclass scenario. The straight rebuy situation is generally the most common buyclass and may be diametrically contrasted with the new task purchasing situation. Levels of perceived risk, required search time, and involvement may be characterized as low. Appropriate levels of quality and price as well as delivery considerations are critical in the straight rebuy decision. The incumbent vendor enjoys a relatively strong advantage as the organizational buying center often perceives the search costs of evaluating alternative sources as outweighing potential

benefits. The third buyclass within the Robinson, Faris, and Wind (1967) framework may be termed the modified rebuy. This scenario involves the reevaluation of a product or service which had been previously purchased. Modified rebuy situations encompass elements of both the straight rebuy as well as the new task decision. The dimensions of perceived risk, involvement, and search time may be considered as moderate (Robinson, Faris, and Wind 1967). The publication of the three aforementioned models (Robinson, Faris, and Wind 1967; Webster and Wind 1972; Sheth 1973) has had a substantial impact on the development of industrial buying behavior as a distinct genre. In their review of this extensive research literature, Johnston and Lewin (1996) noted that: "Together, these three works laid the conceptual foundation for the study of organizational buying behavior" (p.1).

However, other marketing theorists have challenged the distinctiveness of industrial marketing and, by implication, industrial buying behavior, as a separate domain. In their classic challenge to the prevailing paradigm, Fern and Brown (1984) argued that there was insufficient justification for the industrial marketing/consumer marketing dichotomy. Fern and Brown (1984) based this argument upon three different grounds. Their first point of contention was that the industrial/marketing dichotomy does not adequately partition all of marketing phenomena. Drawing upon Hunt's (1976) criteria for evaluating classification schemata, Fern and Brown (1984) were able to identify situations in which the mutual exclusivity of the dichotomous categories was violated - a bookcase, for instance, may be considered both a consumer good as well as an industrial good. In addition, Fern and Brown (1984) were able to cite instances in which Hunt's (1976) principle of collective exhaustiveness was violated. With examples

such as non-profit marketing and services marketing, Fern and Brown (1984) were able to provide instances which did not fit cleanly into the industrial/consumer marketing dichotomy. Continuing with Hunt's (1976) criteria for evaluating classification schemata, Fern and Brown (1984) also challenged the adequacy with which the academic definitions of industrial marketing differed from consumer marketing. Finally, following the guidelines suggested by Hunt's (1976) criteria, the industrial/consumer dichotomy was challenged based upon its usefulness as a schema.

An additional argument advanced by Fern and Brown (1984) may be termed the analysis of variance analogy. According to this perspective, dichotomies are useful when within group variation is minimized and variation between groups is maximized. Consequently, adherents of the traditional paradigm would expect to find that variations between industrial marketing and consumer marketing would exceed the variation that may be found within the two classes of marketing. The perspective presented by Fern and Brown (1984), however, argues the opposite: that "differences within industrial marketing and consumer marketing are greater than those that have long been recognized as distinguishing the two areas" (p. 72). A final line of argument for the insufficient justification of the industrial/consumer marketing dichotomy is the presentation of counter examples. Fern and Brown (1984) were able to present counter-examples to several often-cited distinguishing characteristics of industrial marketing including such cutting-factors as derived demand, negotiated pricing, and the size of the buying committee.

Fern and Brown (1984) were able to raise important concerns regarding the validity of industrial marketing and industrial buying behavior as a distinct research

domain. Nevertheless, their challenge to the prevailing paradigm was unable to resolve the issue one way or another, a conclusion they explicitly state in their concluding remarks. Indeed, as has been documented by Ward and Webster (1991), the research literature on industrial buying behavior may be characterized as voluminous and this has become increasingly so since the publication of Fern and Brown's (1984) challenge. Several journals have largely devoted themselves to the dissemination of industrial marketing research. Since its inception in 1971, *Industrial Marketing Management* has published in excess of 900 papers devoted to scholarly applied research, including more than 100 articles which have focused on the topic of industrial buying behavior (LaPlaca 1997). Other important journals which regularly publish research in industrial buying behavior include the following: *Journal of Marketing*, *Journal of Marketing Research*, *Journal of Business and Industrial Marketing*, *Journal of Business Research*, and *Journal of Business-to-Business Marketing*. In addition, this literature has been noted as rich and multitudinous in terms of its conceptual development and empirical examinations of specific areas (Sheth 1996). In a recent retrospective marking the twenty-fifth anniversary of the publication of Webster and Wind's (1972) original insights on industrial buying behavior, Sheth (1996) attributed the growth and rich diversity of this literature to three fundamental sources. The first of these reasons for the growth of the industrial buying behavior literature lies in the shift from a transactional to a relational paradigm. Secondly, the literature has proliferated in response to the encouragement of the academic journals and professional organizations such as the National Association of Purchasing Management (NAPM). Thirdly, research in industrial marketing has become increasingly influenced by the disciplines of organizational behavior, industrial

organizational economics, and transaction cost theory. However, together with these three explicitly articulated reasons, Sheth (1996) acknowledged the fundamental contributions of Robinson, Faris, and Wind (1967), Webster and Wind (1972), and Sheth (1973) as the middle range theory which enabled the development of the organizational buying behavior literature. In her summation of the industrial buying behavior literature, Wilson (1996) voiced a similar conclusion: "These three models are useful as descriptive, organizing frameworks ... and represented a collective realization of the need for theory in the industrial marketing domain" (pp. 7-8).

Nevertheless, both Sheth (1996) and Wilson (1996) have noted the beginning of a paradigm shift in marketing's understanding of industrial buying behavior. In his consideration of the past performance and future expectations of the research literature, Sheth (1996) noted that four key environmental changes in the nature of the business landscape have led to a shifting paradigm. Sheth (1996) described these four elements as the increasing globalization of business competition, the emergence of the total quality management (TQM) philosophy, the increasing rationalization of industry structure, and the advent of enabling technologies. The result of these environmental changes has been a two-dimensional shift in industrial buying behavior from a paradigm based upon a transactional approach to domestic sourcing to a paradigm based upon a relational approach to global sourcing. Wilson (1996) has noted a similar transition in the industrial buying behavior research literature, from one in which the buyer is studied in isolation to one in which the industrial buyer and seller are conceptualized in terms of their dyadic relationship. In support of this contention, Wilson (1996) was able to provide citations from an extensive array of theoretical as well as empirical work. Among the most

influential of these studies were Anderson and Narus (1984; 1990), Dwyer, Schurr, and Oh (1987), Frazier (1983), Frazier, Spekman, and O'Neal (1988), as well as Heide and John (1990; 1992). Much as Sheth (1996) has ascribed this paradigm shift to environmental change, Wilson (1996) also suggested that environmental changes in the way in which business is transacted were responsible for this shift in the industrial buying behavior paradigm. Among the most important of these environmental changes has been increasing levels of competition from both foreign as well as domestic sources, a proliferation of technological innovations, and the adoption of a "total quality" perspective. Both Sheth (1996) and Wilson (1996) have emphasized the increasing distinctiveness of research in industrial buying behavior due to the shifting nature of the underlying paradigm.

Other research avenues have proposed an integrative framework from which to approach the study of industrial buying behavior. A central theme that is common to all three of the original defining models (Robinson, Faris, and Wind 1967; Webster and Wind 1972; Sheth 1973) is the conceptualization of industrial buying behavior as a process which is affected by environmental influences. These externalities are referred to as "situational influences" in the Sheth (1973) model and represent the influences of the physical, political, economic, competitive, technological, legal, cultural, and global environments on the industrial buying behavior process. Also common to all three models is a recognition of the importance of organizational factors such as organizational structure, size, strategic orientation, and reward structure. A third factor found across all three models is the role of the individual's personal characteristics including educational level, perception, motivation, and experience. As has been documented by Johnston and

Lewin (1996), six other constructs can be extracted from one or another of these three models of industrial buying behavior. Both Robinson, Faris, and Wind (1967) and Sheth (1973) identified vendor characteristics and purchase characteristics as significant influences upon industrial purchasing outcomes. Vendor characteristics may include such factors as price, conformance to specifications, product quality, and ability to meet delivery deadlines. Purchase characteristics are understood in both the Sheth (1973) as well as Robinson, Faris, and Wind (1967) models to include buyclass, level of perceived risk, time pressure, and product complexity. A sixth construct was identified by Johnston and Lewin (1996) as group characteristics. These interpersonal determinants of buying behavior are reflected in the group processes of the buying center, which includes all members of the organization involved in the purchasing decision. Two additional constructs were extracted from the Sheth (1973) model by Johnston and Lewin (1996). The first of these may be termed conflict negotiation characteristics which occupy a rhetorical continuum between the rational and non-rational. The second construct refers to the informational source or sources employed during the search process, including advertising, word-of-mouth, and trade show participation. Johnston and Lewin (1996) combined these nine constructs - stage of process, environmental, organizational, and individual influences, purchase and vendor characteristics, group characteristics, informational source, and conflict negotiation characteristics - drawn from the three original models (Robinson, Faris, and Wind 1967; Webster and Wind 1972; Sheth 1973) to create an integrated model of organizational buying behavior (cf. Appendix: Figure IV). In addition to the aforementioned theoretical constructs, Johnston and Lewin (1996) added two additional *intrafirm* variables and two *interfirm* variables. The *intrafirm*

variables were termed *role stress* and *decision rules* while the interfirm variables were characterized as *buyer-seller relationships* and *communication networks*. Limiting their review of the industrial buying behavior literature to the aforementioned top-tier journals, Johnston and Lewin (1996) were able to identify 165 empirical and conceptual studies. After reviewing this total research stream, 44 empirical articles were identified for subsequent analysis. The variables used in the respective studies were then matched with the 13 constructs identified in the integrated model of industrial buying behavior (cf. Appendix: Figure IV). Johnston and Lewin (1996) then examined the relationships between these variables and the statistical significance of each relationship. The findings of this analysis are intended as a summary of empirical findings on industrial buying behavior. While the matrix columns portray each of the 13 constructs as dependent variables, the rows provide information on each construct as it was used as an independent variable. The diagonal cells are used to provide information on empirical studies in which one or more aspects of a construct were used to predict other aspects of the same construct. Finally, if a study simply examined the correlation between constructs, each of the respective constructs was treated as if it were an independent variable. Overall for the matrix, statistical significance was indicated at $p < 0.10$. However, with only a few exceptions, the statistical significance of the individual studies was at the $p < 0.05$ level.

The intent of this discussion has been to examine the distinctiveness of the industrial buying behavior research domain as compared to the study of consumer buying behavior. Although the legitimacy of the industrial/consumer marketing dichotomy has been challenged (Fern and Brown 1984), the evidence presented by these authors has

been self-acknowledged as inconclusive. Furthermore, the marketing research community, as represented by the editorial boards of its most distinguished publications (*Journal of Marketing*, *Journal of Marketing Research*), has continued to acknowledge the distinctiveness of industrial buying behavior as a research domain through their publication policies. The underlying middle range theory articulated by Robinson, Faris, and Wind (1967), Webster and Wind (1972), and Sheth (1973) has been examined in at least 44 empirical studies over the past 25 years. As Johnston and Lewin (1996) have noted in their meta-analysis of this empirical literature, the constructs identified as influential by those original theorists have largely been shown to possess statistical significance across a broad range of studies. As several pre-eminent marketing scholars have remarked (Sheth 1996; Wilson 1996; Johnston and Lewin 1996), the prevailing paradigm for the study of industrial buying behavior is shifting due to environmental change. This shift from a transactional domestic basis to a relational global basis may further differentiate the study of industrial buying behavior from consumer behavior. As can be seen in the Johnston and Lewin (1996) analysis, non-task variables such as purchase characteristics, buyer characteristics, role stress, and organizational characteristics remain essential to the study of industrial buying behavior. It is these non-task variables and their reaction to order of entry that is at the heart of this dissertation. Both industry-specific (Mascharenhas 1992; Mitchell 1991) as well as cross-sectional (Robinson 1988) studies have demonstrated the presence of first mover advantage in industrial markets yet no study has attempted to examine a possible psychological basis for this phenomenon. In the subsequent discussion, the role of attitude models in the marketing literature is traced.

Multiattribute Attitude Models

There is an extensive tradition within the marketing and social science literatures for the use of attitude models as a means of predicting behavioral intentions. Within the social psychology literature, for instance, this research stream may be documented back to the work of LaPiere (1934). Contemporary perspectives on the role of attitude models distinguish the construct of global attitude from its cognitive and affective components (Engel, Blackwell, and Miniard 1995). Drawing upon the earlier work of Rosenberg (1956) as well as the recognition that attitude may be decomposed into two fundamental components, Fishbein (1967) developed a computational model of multiattribute attitude. The components of this model may be described as beliefs about attributes and evaluative aspects of those beliefs. Symbolically, the Fishbein model can be expressed as:

$$A_o = \sum_{i=1}^N b_i e_i$$

where:

- A_o = the attitude toward the object
- b_i = the strength of the belief that the object has attribute i
- e_{ib} = the evaluation of attribute i
- N = the number of salient attributes

Multiattribute attitude models entered the marketing literature in the late 1960s and early 1970s via near-simultaneous and often collaborative publication by Bass, Talarzyk, Sheth and others (Wilkie and Pessemier 1973). Bass and Talarzyk (1972) developed a multiattribute attitude model specifically adapted to the needs of marketing research in

brand preference. This model was presented earlier (pp. 7-8) and forms the basis for the proposed study. Bass and Talarzyk (1972) were able to demonstrate the predictive efficiency of their model over alternative means of prediction such as market share, multiple discriminant analysis, and random chance. Based upon a national sample of 2000 female heads of households, the Bass and Talarzyk (1972) multiattribute attitude model correctly predicted brand preference within the frozen orange juice category with a 67% probability. Alternative predictive models yielded the following statistically significant results at the .01 level: market share (53%), multiple discriminant analysis based upon beliefs (58%), multiple discriminant analysis based upon demographics (52%), and random chance (20%). Similar findings were uncovered when the product category was shifted to lipstick, brassieres, mouthwash, toothpaste, and toilet tissue (Bass and Talarzyk 1972). Furthermore, Wilkie and Pessemier's (1973) review of 42 empirical studies uncovered complete agreement regarding the issue of model performance:

“Most articles have studied the model's performance against non-attitudinal predictions and without fail report positive results. There is little question that brand attitudes will predict brand preferences significantly better than chance assignments of preference or choice. All authors implicitly or explicitly expressed approval of the approach” (p. 438)

Beyond the predictive efficiency presented in the Bass and Talarzyk (1972) study, the major advantage of the multiattribute attitude model from a managerial perspective is its diagnostic capability (Engel, Blackwell, and Miniard 1995). In their assessment of the multiattribute attitude model, Wilkie and Pessemier (1973) examined 42 empirical studies from the marketing literature in an effort to summarize the relevant

research issues associated with the model. These research issues can be categorized in terms of model components, model specification, and model performance. Wilkie and Pessemier (1973) deconstructed the multiattribute attitude model into the following components: attributes (i), importance weights (W_i), and beliefs (B_{ib}). The research issues surrounding each of these components are addressed in the following discussion.

Attributes (I) form the essential dimensionality of the model and their specification and inclusion is a central concern of marketing researchers. Unfortunately, Fishbein (1967) provided very little guidance concerning attribute specification. According to Wilkie and Pessemier (1973), attribute generation has largely been accomplished through the use of focus groups, expert judgment, and unstructured depth interviews. Examples of these approaches may be seen in Bass and Talarzyk (1971; 1972), Sheth (1970), Talarzyk and Moinpour (1970) as well as Alpert, Kamins, and Graham (1992). A second research issue concerns the selection and inclusion of specified attributes within the final model. Assumptions of independence and parsimony dictate that those attributes which are included within the model not represent a duplicated dimension in order to avoid double-counting the attribute in question. Within the marketing literature, many research studies have not explicitly considered this issue (Wilkie and Pessemier 1973). Consequently, those attributes which have been specified by the aforementioned methods (focus groups, expert opinion, etc.) have been included in the final model with no explicit consideration that their inclusion may falsely weight the model. Wilkie and Pessemier (1973) as well as Sheth (1970) have suggested that use of factor analysis may reduce this possibility. As can be seen from the foregoing discussion, the theoretical basis for the specification and selection of attributes for use

within the multiattribute attitude model remains an under-researched area. Nevertheless, a consensus of the literature is in general agreement on the following three issues related to attributes (Wilkie and Pessemier 1973). The first of these areas of disciplinary agreement is the validity of unstructured qualitative methods as a means of generating lists of attributes. The second general recognition is that attributes are a perceptual rather than objective construct. Finally, Wilkie and Pessemier (1973) found that there is general agreement on the presentation of structured lists of attributes to respondents.

The use of importance weights (W_i) in the marketing literature follows from the original development of the model by Fishbein (1967). Importance weights have been conceptualized by Bass and Talarzyk (1971, 1972) as measures of an attribute's contribution to satisfaction. In their review of the marketing literature Wilkie and Pessemier (1973) noted that the essential research issues regarding importance weights related to their measurement. Fishbein (1967) proposed that importance weights be measured utilizing scales with positive and negative poles. However, marketing research has traditionally used bipolar rating scales with 5, 6, or 7-point intervals. Other methodologies which have been utilized in the marketing literature include rank order, 100-point constant sum scales, and the use of a forced choice yes/no format (Schendel, Wilkie, and McCann 1971). Summarizing research studies of importance weight measurement, these authors found that the use of constant sum and rank order resulted in higher coefficients of concordance. Nevertheless, both Schendel, Wilkie, and McCann (1971) as well as Wilkie and Pessemier (1973) noted the difficulty for respondents posed by the use of these methods.

Brand beliefs (B_{ib}) represent the third structural component of the multiattribute

attitude model. Brand beliefs are the means by which specific judgments and differences enter the multiattribute attitude model. In their review of the marketing literature, Wilkie and Pessemier (1973) noted that the conceptualization of brand belief was marked by a degree of controversy. The principle problem centers on whether brand beliefs should be purely cognitive or both affective and cognitive. Cohen, Fishbein, and Ahtola (1972) argued that brand belief or “expectancy” be purely cognitive while the vast majority of other researchers have advocated the use of affective as well as cognitive dimensions in their conceptualizations of brand belief (Wilkie and Pessemier 1973).

In conclusion, multiattribute attitude models have been extensively employed in the marketing literature for nearly thirty years. Their robustness in terms of the prediction of global attitudes as well as behavioral intentions has been thoroughly documented (Wilkie and Pessemier 1973). As has been presented earlier, multiattribute attitude models have also seen specific use in examinations of consumer attitudes toward order of entry (Alpert and Kamins 1995) as well as reseller buyer attitudes toward order of entry (Alpert, Kamins, and Graham 1992).

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

The central focus of this chapter is the presentation of the hypotheses which were suggested by the research literature and intended to fill the research gap which was identified in the previous chapters. In addition, the research strategies which have been adopted to test these hypotheses are presented. Five major discussions unfold in this chapter and include the presentation of the research hypotheses, the research setting, the research design, measurement issues, and the proposed analytic techniques. The research setting provides the context of the study. This section is followed by a description of the proposed research design, including details on the unit of analysis, key-informants, sampling procedures, and data collection methods. Following this discussion, the question of measurement issues is addressed, including a detailed presentation of the measurement instrument and pretest format. Finally, the analytical methods which are to be employed are discussed.

Statement of Research Hypotheses

The research framework of this dissertation proposes that the foundation of this study be built upon the juxtaposition of the Fishbein and Ajzen (1975) multiattribute attitude model with the cognition/affect/conation paradigm of high involvement purchasing (Engel, Blackwell, and Miniard 1995). Empirical studies of consumer and reseller buyer global attitudes toward pioneering brands have served to reinforce the theoretical basis of first mover advantage (Alpert, Kamins, and Graham 1992; Alpert and Kamins 1995). However, important distinctions between consumer and industrial buying behavior have been identified by many marketing researchers (Webster and Wind 1972; Sheth 1973; Kotler 1997). Consequently, the primary research focus of this dissertation centers on whether, in fact, industrial purchasing managers hold different attitudes towards brands based upon their order of entry. The empirical testing of this issue requires that it be formatted as a formal research hypothesis. Therefore, the initial component (H1a) of the first research hypothesis is designed to determine if there are differences in global attitude toward order of brand entry in an industrial context:

H1a: Industrial purchasing managers' global attitudes are significantly different toward pioneer brands, early followers, and late entrants.

If statistically significant differences in attitude can be detected based upon order of entry the issue of attitudinal preference moves to the center of interest. Based upon previous research on the role of global attitude as a source of pioneer advantage (Alpert, Kamins, and Graham 1992; Alpert and Kamins 1995), the second component (H1b) of

the first hypothesis seeks to ascertain whether survey respondents are more favorably disposed toward pioneers as opposed to early followers and late entrants:

H1b: Specifically, industrial purchasing managers' global attitudes are most favorable toward pioneers, followed respectively by early followers and then late entrants.

An accepted methodology for explaining the basis of global attitude is the multiattribute attitudinal model (Fishbein and Ajzen 1975). As presented, multiattribute attitude models have proven highly robust in terms of predicting global attitude as well as purchasing intention (Wilkie and Pessemier 1973). Therefore, the second hypothesis (H2) utilizes the total scores generated by the multiattribute attitude model as a means of calculating overall attitude. Specifically, the initial component (H2a) of the second research hypothesis is designed to determine if there are differences in multiattribute attitude toward order of brand entry in an industrial context:

H2a: Industrial purchasing managers' overall attitude as calculated by the multiattribute attitude model is significantly different toward pioneer brands, early followers, and late entrants.

The second phase of H2 follows the pattern established in the presentation of the first hypothesis (H1). Logic suggests that should statistically significant differences in attitude toward order of entry be detected, then the direction and strength of these differences should be investigated. Again, based upon Alpert, Kamins, and Graham's (1992) research on the role of global attitude as a source of pioneer advantage, the next stage of the second hypothesis (H2b) seeks to ascertain whether survey respondents are

more favorably disposed toward pioneers as opposed to early movers or late entrants.

Specifically, H2b stipulates that:

H2b: The overall attitude of industrial purchasing managers as calculated by the multiattribute attitude model will favor pioneers over early followers and late entrants.

Should this be answered in the affirmative, a secondary research objective will be to examine the sources of these differences in global attitude toward order-of-brand entry.

Contemporary perspectives on the role of attitude models distinguish the construct of global or overall attitude from its cognitive and affective components (Engel, Blackwell, and Miniard 1995). As has been presented earlier, these attitudinal components may take the form of buyers' beliefs, perceptions, and values regarding the brand (Wilkie and Pessemier 1973). While the first (H1) and second (H2) research hypotheses are designed to explore the presence and direction of differences in overall attitude toward order of entry, the third research hypothesis (H3) attempts to examine the component aspects of industrial purchasing manager beliefs, attitudes, and perceptions. This approach to the multiattribute attitude model relies upon the consumer behavior research paradigm (Engel, Blackwell, and Miniard 1995) that beliefs are precursors to and components of attitudes. This research stream has established that global attitude can be decomposed into a multiattribute set of beliefs and perceptions (Wilkie and Pessemier 1973). Consequently, the following series of six sub-hypotheses attempts to measure the beliefs of industrial purchasing managers toward order of brand entry.

The first of these sub-hypotheses attempts to examine the beliefs of industrial purchasing managers regarding the technological leadership of pioneers. It is useful to

note that technological leadership and patent protection are distinct constructs. Although the criticality of patent protection as a potential barrier to entry is cited in several treatments of first mover advantage (MacMillan 1982; Lieberman and Montgomery 1988; Lambkin 1992), empirical evidence seems to point in the opposite direction (Robinson and Fornell 1985; Robinson 1988). What does emerge from the empirical literature is a pattern of research leadership on the part of pioneers. Miller, Gartner, and Wilson (1989) found that pioneers invested in significantly higher levels of R&D than late entrants. De Castro and Chrisman (1995) found that a significantly greater number of pioneers chose to compete based upon a differentiation strategy, implying the possession of higher levels of innovativeness and technological leadership. Consequently H3a attempts to ascertain whether industrial purchasing managers perceive pioneer suppliers as technological leaders:

H3a: Industrial purchasing managers believe that pioneer firms have greater levels of technological leadership than early followers and late entrants.

The second of these sub-hypotheses examines the perceived quality of supplier products based upon order of entry. A central finding of the cross-sectional order-of-entry literature is the linking of first mover advantage with products of higher relative quality (Robinson and Fornell 1985; Robinson 1988; Lambkin 1988; Miller, Gardner, and Wilson 1989). However, a potentially pertinent criticism of PIMS-based literature is its reliance upon self-reported data (Kerin, Varadarajan, and Peterson 1992; Golder and Tellis 1993; Schnaars 1994). Therefore H3b attempts to ascertain whether industrial purchasing managers perceive pioneer products as possessing relatively higher quality:

H3b: Industrial purchasing managers believe that pioneer products are of higher relative quality than those of early followers and late entrants.

The third sub-hypothesis examines another finding of the PIMS-based research supportive of first mover advantage. A well-documented finding of the cross-sectional order-of-entry literature is the linking of first mover advantage with greater breadth of product line (Robinson and Fornell 1985; Robinson 1988; Lambkin 1988). Again, several researchers have noted the self-reported nature of the PIMS data as a potential criticism (Kerin, Varadarajan, and Peterson 1992; Golder and Tellis 1993; Schnaars 1994). Consequently, H3c seeks to determine if industrial purchasing managers do perceive pioneers as possessing broader product lines:

H3c: Industrial purchasing managers believe that pioneer firms offer relatively broader product lines than do early followers and late entrants.

The fourth sub-hypothesis draws upon the competitive strategy literature (Porter 1980; 1985) and attempts to examine whether industrial purchasing managers believe that the incorporation of pioneering components and technologies will enhance the competitiveness of their own final products:

H3d: Industrial purchasing managers believe that the use of pioneer components and technologies will enhance the competitiveness of their own firms' products more so than those of early followers and late entrants.

The early findings of the consumer economics literature (Schmalensee 1982; Conrad 1983) suggest that a critical source of first mover advantage lies in the concepts of risk aversion and the presence of search costs. Additionally, Carpenter and Nakamoto (1989) as well as Kardes and Kalyanaram (1992) have argued that consumer experience

with the pioneer has an important role in the formation of brand preference. Therefore, the fifth sub-hypothesis (H3e) seeks to ascertain whether industrial purchasing managers believe that greater confidence should be placed with firms which have a longer track record within the product category:

H3e: Industrial purchasing managers believe that greater confidence will be placed with firms that have been in business longer within the relevant product category. Consequently, greater confidence should be placed in pioneer firms, followed respectively by early followers and then late entrants.

One of the tenets of the competitive strategy literature is that the long-run profitability of an industry is influenced by the relative presence of five forces (Porter 1980; 1985). For the industrial purchasing manager, the most pertinent of these five structural forces may be the relative bargaining power of suppliers. The sixth sub-hypothesis seeks to determine if industrial purchasing managers believe that early additional entrants into a product category will reduce the firm's dependence upon a sole pioneer supplier:

H3f: Industrial purchasing managers believe that early followers are more likely to reduce the firm's dependence on a sole supplier than are late entrants.

A second approach to the components of global attitude involves the examination of subjective perceptions toward order of entry utilizing a semantic differential format. The dissertation proposes to accomplish this through the use of 13 items selected from Scale #31 (pp. 82-92) as published in the *Marketing Scales Handbook* (Bruner and Hensel 1992). According to Bruner and Hensel (1992), these semantic differential scales

consist of bipolar adjectives which are intended to measure a subject's overall attitude toward the brand or product. Originally developed by Osgood, Suci, and Tannenbaum (1957), the use of semantic differential scales to examine attitude toward the brand has an extensive tradition within the marketing literature. Among the more recent researchers who have utilized items from the aforementioned scale are Hastak and Olson (1989), Gill, Grossbart, and Laczniak (1988), Cox and Locander (1987), and Bello, Pitts, and Etzel (1983). These particular items have been chosen from Scale #31 based upon their relevance to the issue of order of entry and attitude towards the brand. This methodological approach has been validated in empirical examinations of order of entry with consumers (Alpert and Kamins 1995). Internal logical consistency dictates that two sub-hypotheses be developed to examine this issue. The first (H4a) seeks to determine if there is a perceptual bias toward pioneers rather than early followers, while the second (H4b) attempts to test whether pioneers are favored over late entrants. Consequently, the following sub-hypotheses are proposed:

H4a: Industrial purchasing managers perceptions of pioneer brands will be significantly more favorable on semantic differential dimensions relative to early followers.

H4b: Industrial purchasing managers perceptions of pioneer brands will be significantly more favorable on semantic differential dimensions relative to late entrants.

Corporate image has been proposed as a multidimensional construct incorporating product design and product positioning (Kotler 1997) as well as the architecture of the

firm's plants, offices, warehouses, dealerships, franchised outlets, and retail stores (Gross, Banting, Meredith, and Ford 1993). Furthermore, it has been suggested that corporate strategy should interpret and project the basic orientation of the firm through a cohesive image which permeates through "brand names, trademarks, corporate logos, signage, letterhead, corporate publications, advertising, sales promotional materials, industrial and trade fair exhibits, community projects, publicity...company cars and trucks, and employee uniforms" (Gross, Banting, Meredith, and Ford 1993, pp. 358-359). This multidimensional construct of corporate image has been interpreted as roughly analogous to that of self-image (Garbett 1988). Furthermore, the acquisition of all of these products may be within the purview of the industrial purchasing manager. In both their theoretical framework (Alpert and Kamins 1994) as well as their empirical investigation of consumer attitudes and perceptions toward order of brand entry (1995), Alpert and Kamins have presented the proposition that a potential source of first mover advantage may lie in the tendency toward consistency between product image and consumer self image. This concept of product image/self image consistency has a rich tradition within the consumer behavior literature (Sirgy 1982). Consequently, this study hypothesizes that a similar mechanism may operate within the corporate context:

H5: For the industrial purchasing manager, pioneer brand image will more closely match ideal firm image than will that of early followers or late entrants.

Based upon the aforementioned cognitive/affective/conative paradigm of high involvement purchasing, the previously discussed cognitive and affective components have

been hypothesized to result in favorable perceptions of, and attitude toward, first movers. This, in turn, should be translated into a preference advantage for pioneers over both early followers as well as late entrants. Experimental designs involving MBA students have disclosed that such a preference exists (Carpenter and Nakamoto 1989; Kardes and Kalyanaram 1992). Empirical studies of first mover market share within industrial markets have resulted in a similar finding (Robinson 1988). Consequently this dissertation proposal hypothesizes that under *ceteris paribus* conditions, industrial purchasing managers will prefer to purchase pioneer products rather than early followers or late entrants:

H6: Other things being equal, industrial purchasing managers prefer pioneer brands in terms of product purchase preference.

As has been presented, fourteen distinct hypotheses have been developed from the order of entry and industrial buying behavior literatures. The overall purpose of these hypotheses is to examine differences in industrial purchasing manager cognition, affect, and conation regarding order of brand entry. Theoretical linkages between cognition, affect, and conation have been proposed as an insight into industrial purchasing behavior and a potential source of first mover advantage.

The Research Setting

The study was carried out within four major industry groups, coming under the two-digit classifications 35, 36, 37, and 38 of the Standard Industrial Classification Manual (1987). The Standard Industrial Classification (SIC) system is in the process of being replaced by the North American Industry Classification System (NAICS) in order to better reflect the regionalization of the North American economy as well as the shift in emphasis from product to process in industrial analysis. Although the NAICS was officially approved in early 1997, the first actual publication of economic census data using the new system will not occur until 1999 and full implementation is not expected to occur until 2004 (*Business Statistics of the United States: 1996 Edition* 1997). Consequently, the SIC system is used in this study. A brief description of these four industry classifications follows:

SIC 35: Non-electrical machinery is the focus of this two-digit SIC. Included within this classification are firms producing industrial trucks and tractors, machine tools, power-driven hand tools, textile machinery, and printing machinery.

SIC 36: Electrical and electronic machinery, equipment, and supplies form this two-digit SIC. Included within this classification are firms producing motors and generators, electric lamps, radios, televisions, telecommunication equipment, and semiconductors.

SIC 37: Transportation equipment is contained within this two-digit SIC. Firms which manufacture automotive, truck, aerospace, maritime, and railroad equipment are included within this classification.

SIC 38: Measuring, analyzing, and controlling instruments are included within this classification. Firms which manufacture research, photographic, medical, and optical equipment and instruments are included within this classification.

These industrial classifications are proposed as a sampling population for the following three reasons. First, the purchase of materials and components is of strategic importance to these industries. According to the Standard Industrial Classification Manual (1987), these four groups together represent a total of 123 industries when classified at the 4-digit SIC level. Their aggregated total sales exceeded \$943 billion in 1995. Employment within these industries exceeds 6 million, of whom 3.8 million can be classified as production workers (*Annual Survey of Manufactures* 1995). With a total cost of goods sold valued at approximately \$476 billion, the procurement of materials and components forms a substantial and strategic activity within these industries.

Second, substantial variation can be found in the purchasing strategies pursued by the firms within the proposed sampling population. For instance, substantial differences in the cost of goods sold as a percentage of total sales can be found within each two-digit industrial classification. In SIC 35, the cost of goods sold as a percentage of total sales ranges from 40% to 60% while in SIC 36 and SIC 37 the ranges are between 40% and 70%. The variation within SIC 38 ranges from 30% to 50%. Considerable variation can also be found across the relevant two-digit SICs when the ratio of value-added/worker is examined. In SIC 35, for instance, value-added/worker ranges between \$65.9 and \$294.3 while in SIC 36 the ratio ranges between \$88.8 and \$187.2. The accompanying tables (Tables 4, 5, 6 and 7) provide a finer breakdown of these descriptive statistics at the level of the three-digit industry definition for each of the major two-digit SIC groups. A summary of these descriptive statistics is provided in Table 8. The wide range of large variances in these and other economic indicators, within each industry two-digit group

and across the four industry classifications, suggests that there is a likelihood of a reasonable distribution of strategic orientations regarding order of entry.

Finally, previous research (Perdue and Summer 1990; Perdue 1992) has established a precedent for the use of these particular two-digit classifications. In both of these research studies, SIC 35, SIC 36, SIC 37 and SIC 38 formed the sampling population for an investigation of purchasing strategies within an industrial context.

Table 4: SIC Group 35: Industrial Machinery and Equipment

	Total	Average /Industry	Std. Dev.	Low	High
Employees	1876.7	208.5	78.2	83.2	309.6
Employee Salaries	56423.6	6269.3	2454.3	2409.2	10268
Value-added	132165.8	14685.1	6715.1	7159.0	31283
Cost of goods sold	123569.0	13729.9	7052.6	8523.5	32276
Sales	256344.7	28482.7	13514.3	16456.2	64073
COGS/Sales		0.5	0.1	0.4	0.6
Mean Employee Salary		30.2	3.5	25.6	35.8
Value-added/Employee	70.4				
Value-added/\$ Salary	2.3				

* Units of employees in thousands; all others in millions

Source: Annual Survey of Manufactures 1995

Table 5: SIC Group 36: Electronic and Electrical Equipment

	Total	Average /Industry	Std. Dev.	Low	High
Employees	1497.4	187.2	144.3	44.7	535.9
Employee Salaries	42067.4	5258.4	4359.3	998.8	15292
Value-added	106983.9	13384.2	10487.1	3150.0	37270
Cost of goods sold	87820.3	10977.5	5800.7	4464.1	23558
Sales	194847.9	24356.0	16138.6	9376.7	60844
COGS/Sales		0.5	0.1	0.4	0.7
Mean Employee Salary		26.7	3.5	22.3	34.6
Value-added/Employee	71.5				
Value-added/\$ Salary	2.5				

* Units of employees in thousands; all others in millions

Source: Annual Survey of Manufactures 1995

Table 6: SIC Group 37: Transportation Equipment

	Total	Average /Industry	Std. Dev.	Low	High
Employees	1773.7	253.4	267.0	9.4	704
Employee Salaries	62854.7	8979.2	7981.1	213.5	24792
Value-added	146916.3	20988.1	24602.5	570.8	69648
Cost of goods sold	23465.0	31923.6	49280.4	928.6	45831
Sales	367926.7	52561.0	72771.4	1475.8	14963
COGS/Sales		0.6	0.1	0.4	0.7
Mean Employee Salary		31.2	6.6	22.7	42.1
Value-added/Employee	82.8				
Value-added/\$ Salary	2.3				

* Units of employees in thousands; all others in millions

Source: Annual Survey of Manufactures 1995

Table 7: SIC Group 38: Instruments and Related Equipment

	Total	Average /Industry	Std. Dev.	Low	High
Employees	948.6	158.1	123.2	9.4	313.6
Employee Salaries	31572.4	5262.1	4413.5	218.3	12257
Value-added	81665.6	13610.9	9318.6	665.4	24931
Cost of goods sold	41619.3	6936.5	4747.0	672.5	11703
Sales	123776.7	20629.4	14089.5	1360.2	36733
COGS/Sales		0.4	0.1	0.3	0.5
Mean Employee Salary		30.1	6.5	21.6	39.1
Value-added/Employee	86.1				
Value-added/\$ Salary	2.6				

* Units of employees in thousands; all others in millions

Source: Annual Survey of Manufactures 1995

Table 8: Summary of SIC Groups 35 to 38

	Total	Average /Industry	Std. Dev.	Low	High
Employees	6096.0	203.2	167.7	9.4	704.4
Employee Salaries	192917.9	6430.6	5937.7	213.5	24792
Value-added	467821.8	15594.1	14511.4	570.8	69648
Cost of goods sold	476473.4	15882.4	26056.0	672.5	45831
Sales	942896.2	31429.9	39282.0	1360.2	14963
COGS/Sales		0.5	0.1	0.3	0.7
Mean Employee Salary		29.4	5.4	21.6	42.1
Value-added/Employee	76.7				
Value-added/\$ Salary	2.4				

* Units of employees in thousands; all others in millions

Source: Annual Survey of Manufactures 1995

Research Design

Research design constitutes a road map which outlines the critical path of a research problem (Davis and Cosenza 1988). Within the parameters of the research design are the means and methods by which the proposed course of study will be carried out. The following section outlines in detail the study's research design. Included in this discussion is a presentation of the issues surrounding the research method, unit of analysis, choice of key-informants, sample frame, and data collection.

Method

Research methods may be described as either experimental or non-experimental. The proposed investigation is an example of non-experimental research. As Kerlinger (1986) noted, non-experimental research is "... systematic empirical research in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable" (p. 348). In the context of this study, the beliefs and attitudes of industrial purchasing managers toward pioneering brands are beyond the control of the researcher and hence the choice of a non-experimental research method can be considered appropriate. Furthermore, the use of a survey methodology to collect data regarding these beliefs and attitudes can be described as consistent with a positivist framework (Creswell 1994). Although research in organizational buying behavior has been criticized for its over-reliance upon survey methodology (Sheth 1996), mail survey has an extended tradition

within this research stream (LaPlaca 1997) and is the proposed method of choice for data collection. Survey methodologies represent an *ex post facto* design in that questionnaires are generally used to elicit information from the participants after the fact (Davis and Cosenza 1988). Research methodologists have identified several justifications for the use of a survey methodology:

1. Surveys enable researchers to study large, geographically-dispersed populations at an efficient cost and in an effective manner (Babbie 1990).
2. Surveys may be adapted to almost any research environment (Davis and Cosenza 1988).
3. Surveys may be checked for the validity of the data (Davis and Cosenza 1988).
4. Survey design provides a quantitative description of some fraction of the total population and allows the researcher to generalize the findings from the sample to the population as a whole (Creswell 1994).

These advantages, combined with the aforementioned research tradition and the impossibility of controlling the study variables, argue for the use of a survey methodology.

Unit of Analysis

In his *Survey Research Methods*, Babbie (1990) defined the unit of analysis as the “what” or “who” which is being studied. More formally, Davis and Cosenza (1988) defined the unit of analysis as the primary empirical object, individual, or group under investigation. For the purpose of this study, the unit of analysis may be defined as the individual strategic business unit of a firm that is a member of the population of firms

categorized under the following two-digit SIC codes: SIC 35, SIC 36, SIC 37, and SIC 38.

Key-Informants

Given that the unit of analysis is the individual strategic business unit, it is imperative that key-informants be used. The use of key-informants is a technique designed to obtain quantified data about the organization in question. Many studies in marketing and organizational buying behavior have employed the key-informant technique (e.g., Alpert, Kamins, and Graham 1992; Dwyer, Schurr, and Oh 1987; Perdue and Summers 1991). The pivotal role of a key informant is to provide reliable information about the organization of which he/she is a member. An early authority on this particular research method, Campbell (1955) defined the key informant as a “member who occupies such a role as to be well informed but who at the same time speaks the social scientist’s language” (p. 339). Furthermore, according to Campbell (1955), the key-informant must not only be able to communicate with the researcher but also to relate to the investigator’s “frame of reference and his interest in abstract, generalized, and comparative aspects of culture” (p. 339). In a similar vein, Seidler (1974) defined key-informants as “those knowledgeable participants who observe and articulate social relationships for the researcher” (p. 816). Despite the sociological tone of the preceding definitions, they can be considered as appropriate in the context of research in industrial buying behavior.

In this study, each strategic business unit is represented by a single key-informant. While it is acknowledged that single-informant data can be inadequate (Phillips 1981), this issue is not considered a serious threat to the validity of this research study. In the case of the Phillips study (1981) complex social judgments were involved, raising the issue of response bias based upon social desirability considerations. In this proposed study, key-informants will be questioned regarding their beliefs and attitudes towards order of entry, an issue which should not evoke biased responses based upon social desirability. To minimize the possibility of social desirability response bias, the proposed survey makes extensive use of Likert and semantic differential scales with a neutral point. In this way, the respondent is not forced to make a choice. Additionally, the anonymity of the respondent is emphasized both in the questionnaire as well as the cover letter in an attempt to minimize social desirability response bias. Finally, there is a potential disadvantage in using a multiple key-informant format. Selecting multiple key-informants within an organization is much like cluster sampling. As Cuttance (1987) has noted: “cluster sampling methods on intact units with a multilevel structure (e.g., pupils within schools) may give rise to observations that do not satisfy the independence assumptions of linear models” (p. 250). These arguments reasonably justify the use of single key-informants.

Sampling

In this section, the methodology for selecting the sample of strategic business units is discussed. As has been mentioned previously, the unit of analysis is represented by the strategic business unit within the two-digit SIC codes 35 through 38.

The National Association of Purchasing Management agreed to provide a mailing list of approximately 6000 of their members who have managerial purchasing responsibilities within the defined population of SIC codes 35 through 38. From this sampling frame, a sample of 1000 individuals was randomly selected. As Neter, Kutner, Nachtsheim, and Wasserman (1996) explained: "...randomization can provide the basis for making inferences without requiring assumptions about the distribution of the error terms" (p. 1050). The procedure for selecting the random sample from the sample frame provided by the NAPM entailed the use of a computer-generated random number table. Both Babbie (1990) and Creswell (1994) have described this method of randomization as highly rigorous. This initial sample of 1000 was chosen to ensure at least 200 responses based upon a response rate of 20 percent. The choice of sample size was guided by considerations of Type I error and Type II error as well as statistical power, estimated variance, and acceptable tolerance level (Dillon, Madden, and Firtle 1987).

Data Collection

Careful consideration was extended to ensure adequate response rates for the survey. Given the generally low response rates in mail surveys (Kanuk and Berenson 1975), special care is necessary to increase the probability of response. Some of Pressley's (1980) recommendations for improving mail survey response rates from industrial organizations were followed. Pressley (1980) noted that the professional appearance of the questionnaire was an important determinant to completed response. Careful attention was paid to considerations of typeface and the avoidance of clutter

through the liberal use of white space. Drafts of the questionnaire were critiqued by marketing and publishing professionals as well as business professors who have been active in industrial marketing research, and their suggestions were incorporated. Although the proposed instrument was not excessively long, the length of the questionnaire may be a survey research consideration. According to Kanuk and Berenson (1975), shorter questionnaires have not been shown to generate higher response rates than longer questionnaires. Furthermore, Jobber's (1989) study of response rates indicated that there were no statistically significant differences in response rates between 5-page and 9-page questionnaires among industrial participants. Nevertheless, questionnaire length does have an impact on postage as well as printing costs. Consequently, the length of the questionnaire was limited to four 8.5" x 11" pages. These pages were packaged as a booklet formed from a single 11" x 17" sheet of paper printed on both sides. An example of the questionnaire is included in the Appendix (Exhibit A). Also included in the Appendix are examples of the cover letter (Exhibit B) as well as the proposed follow-up cover letter (Exhibit A).

Potential respondents were informed of the source of the sample frame, thereby suggesting the implicit support of the National Association of Purchasing Management for the study. As Dillon, Madden, and Firtle (1987) have noted, the limited research conducted on survey sponsorship appears to indicate that official sponsorship does encourage response. Potential respondents were also informed of the sponsorship of Old Dominion University and Gettysburg College. In a study of this issue conducted by Faria and Dickinson (1992), it was found that university sponsorship resulted in a response rate of 43.5% as opposed to the 24.4% rate associated with corporate sponsorship. Jobber's

(1989) review of tactics employed to increase response rates among industrial professionals found support for the use of respondent anonymity. Consequently, potential respondents were assured of confidentiality at every occasion. The expected benefits of this study for the purchasing discipline were also presented in the cover letter as an attempt to encourage participation in the study. Jobber (1989) also found that the inclusion of a prepaid return envelope was associated with increased response rates. Therefore, this guideline was followed in the proposed data collection effort. One counterintuitive finding of this study (Jobber 1989) was that no support was found for an increase in response rate due to the offer of a summary of research results. Nevertheless, an offer of a research summary was extended to study participants, given that the nature of the research may be of professional interest.

Dillman (1978) identified several key steps in the administration of a research survey which have proved effective in increasing response rates. The first of these procedures is to send a follow-up postcard reminder to potential respondents one week after the original surveys have been sent. The second recommendation specified by Dillman (1978) is to identify those who have responded and those who have not by the end of the third week. Individual respondents may be identified through the use of a four-digit code contained within the return address on the prepaid return envelope. Once non-respondents have been identified, a follow-up cover letter together with a second copy of the questionnaire should be mailed to them. In addition, Creswell (1994) recommended that a second postcard be sent to non-respondents, urging them to complete and return the research questionnaire. The accompanying timeline (Table 9) summarizes the course of the survey administration.

Table 9: Survey Administration Timeline

Week 1	First wave of questionnaire mailings
Week 2	Mailing of initial postcard reminders
Week 3	Identification of non-respondents
Week 4	Second wave of questionnaire mailings
Week 5	Mailing of second postcard reminders

Measurement

Measurement is a fundamental aspect of the scientific method and has been defined in a general way as the assignment of numerical values to research phenomena (DeVellis 1991). However, measurement in the context of the social sciences presents a special problem to the researcher as many of the variables of interest, such as beliefs, attitudes, and motivational states are not directly observable. While demographic variables such as gender or ethnicity are largely self-evident, other variables of interest to the researcher are only available through the use of survey instruments. Such is largely the case regarding the measurement of beliefs and attitudes (DeVellis 1991). One of the distinct advantages of a survey methodology lies in its ability to validate measurements. This advantage is particularly fortuitous as validation is precisely what is required in survey research. Validation is particularly critical because of its ability to identify three

kinds of potential survey error, namely: sampling error, non-sampling error, and measurement error.

Sampling error is a category of random error that can be largely controlled through careful attention to the definition and identification of the sample population. In addition, sampling error may be minimized through the use of appropriate sample sizes (Assael and Keon 1982). While the problem of sampling error is largely manageable, non-sampling error represents a special area of concern for the researcher. For instance, Assael and Keon (1982) described one situation in which non-sampling error represented as much as 95% of the total survey error. Non-sampling error is a component of total survey error that largely eludes elimination and exact quantification (Assael and Keon 1982). Non-sampling error may be decomposed into two sub-components: response error and non-response error. While it is extremely difficult to identify the total extent of non-sampling error, Assael and Keon (1982) have suggested that the magnitude of response error is generally minimal as compared to non-response error. Furthermore, these researchers have recommended that generating higher rates of response is an effective strategy for minimizing non-response error.

The third component of total survey error consists of measurement error. While the problem of measurement error is also a factor in experimental research settings, the ability of the researcher to exercise direct control over the independent variables substantially reduces the possibility of measurement error. Such an advantage is far more difficult to implement in non-experimental research designs such as survey methodologies. Nevertheless, a relatively high degree of control can be achieved through the following means. The first of these approaches to minimizing measurement error

may be described as *a priori* and involves taking precautions prior to the development of reliable measures and throughout the administration of the survey. The second approach may be characterized as *ex post facto* and attempts to manage measurement error through the implementation of analytical techniques designed to partial out error. The development of the measurement instrument is described more fully in the following discussion. Careful consideration is also given to the procedures employed to minimize measurement error.

Operationalization

Operationalization has been defined by Stevens (1966) as the process of assigning numbers to empirical events according to a set of rules. This classic interpretation regards measurement as a function which is detached from theoretical propositions and relationships such as those which have been articulated by Bollen (1989). More contemporary conceptualizations of measurement define operationalization as the process of forming measures of the latent construct.

In this study, the constructs of *beliefs regarding order of entry* and *attitude toward order of entry* were measured using multiple indicants. Indicants in this study address some aspect of their associated constructs in the form of statements. Some of these indicants have been used before by other marketing scholars, albeit in different contexts. Other indicants were developed based upon a review of the conceptual literature. The following discussion summarizes the initial selection of indicants that will be used in pre-testing the survey instrument. The appropriate references have been cited where applicable, as have item-to-total correlations from these references.

The initial items in the instrument are designed to capture demographic and contextual material which may prove useful in the determination of non-response bias as well as subsequent analysis. These initial items are included in section "A". These items include the following:

1. SIC group membership
2. Market domain
3. Degree of competition faced by the SBU
4. Measures of SBU size in terms of employees and 1997 revenue
5. Experience with the firm and the purchasing function

Following this section is a series of working definitions of the order-of-entry terms: "pioneer", "early follower", and "late entrant". These working definitions are based upon the tripartite research tradition (Kerin, Varadarajan, and Peterson 1992) as well as the earlier discussion of definitional issues presented on pages 8-12 of the dissertation.

Section "B" includes the measures of global attitude toward pioneers, early followers, and late entrants and is designed to test H1. Drawing upon the precedents established by Smith and Swinyard (1983) as well as Alpert and Kamins (1995), these measures of global attitude use a 7-point Likert scale anchored by the bipolar phrases "extremely negative" and "extremely positive". Alpert and Kamins (1995) reported a Cronbach's Alpha of .81 for the pioneer brand and .77 for the follower brand. A similar measure of global attitude was used by Petroschius and Crocker (1989) with a reported Cronbach's Alpha between .75 and .87. Additional use of this measure by Duncan and Nelson (1985) yielded a Cronbach's Alpha of .71.

Sections "D", "F", and "H" represent the components of the multiattribute attitude model and are designed to test H2 and its iterations: H2a, H2b, H2c, H2d, H2e, and H2f.

Multiattribute attitude models have been extensively employed in the marketing literature and their robustness has been thoroughly documented (Wilkie and Pessemier 1973). As has been presented earlier, multiattribute attitude models have also seen specific use in examinations of consumer attitudes toward order of entry (Alpert and Kamins 1995) as well as reseller buyer attitudes toward order of entry (Alpert, Kamins, and Graham 1992). Section "D" explicitly asks the respondent to assign an importance weight (W_i) to each of the six attributes (I) considered in the model. As discussed earlier, these six attributes have been generated through discussions with purchasing professionals as well as the research literature. They represent the constructs of vendor technological leadership, product quality leadership, product line breadth, supplier contribution to firm competitiveness, supplier longevity, and firm perceptions of supplier bargaining power. These measures of importance weight are configured with 7-point Likert scales anchored by the phrases "very important" and "not very important". Sections "F" and "H" are intended to elicit the beliefs (B_{ib}) component of the multiattribute attitude model. Here, 7-point Likert scales anchored by the phrases "very likely" and "not very likely" are used to measure strength of respondent belief.

Sections "C", "E", and "G" are intended to elicit measures of attitude toward order of brand entry and draw upon an extensive tradition in the marketing research literature (Bruner and Hensel 1992). Sections "C", "E", and "G" have been designed to test H3. Each of these sections utilizes 13 measures of subjective perceptions of attitude toward the brand drawn from the 30 items which make up Scale #31 (pp. 82-92) as published in the *Marketing Scales Handbook* (Bruner and Hensel 1992). These semantic differential items are intended to measure attitudes toward pioneer, early follower, and

late entrant brands. A 7-point Likert scale is anchored by bipolar phrases as originally suggested by Osgood, Suci, and Tannenbaum (1957) and employed by Hastak and Olson (1989), Gill, Grossbart, and Laczniak (1988), Cox and Locander (1987), and Bello, Pitts, and Etzel (1983). Each of these research efforts has utilized different portions of this scale with the appropriateness of the chosen items left to individual researcher judgment. In their commentary on the validity of Scale #31 Bruner and Hensel (1992) did note that although the use of these items is a generally recognized method for measuring attitude toward the brand, each configuration of the scale may represent a slightly different conceptualization of the construct. The reliability of these items has been found to be highly satisfactory. Hastak and Olson (1989) reported a Cronbach's Alpha of .90 while Gill, Grossbart, and Laczniak (1988) reported a Cronbach's Alpha of .95. Cox and Locander (1987) found a Cronbach's Alpha of .90 while Bello, Pitts, and Etzel (1983) reported a .86. For the present research, the proposed choice of 13 scales was suggested by Alpert and Kamins' (1995) study of consumer attitude toward order of entry. These researchers reported a Cronbach's Alpha for the entire set of .78 when describing pioneer status and .82 when describing follower brands.

Section "J" utilizes 7 of the 13 previously used measures of subjective perceptions of attitude toward the brand drawn from Scale #31 (pp. 82-92) as published in the *Marketing Scales Handbook* (Bruner and Hensel 1992). Hence section "J" represents a subset of sections "C", "E", or "G". Section "J" is modeled on the pioneer image/self-image consistency measures suggested by Alpert and Kamins (1995) and is intended to elicit a measure of ideal corporate self-image. Section "J" is intended to test H4. Degree of consistency may be established through the use of mean absolute difference scores

elicit a measure of ideal corporate self-image. Section “J” is intended to test H4. Degree of consistency may be established through the use of mean absolute difference scores across the 7 shared items. Alpert and Kamins (1995) reported a Cronbach’s Alpha of .61 across the scale.

Section “T” has been designed to capture purchase preference and is intended to test H5. This measure of purchase preference was explicitly suggested by Alpert and Kamins (1995) and implicitly drawn from the entire order-of-entry research canon. This measure assumes *ceteris paribus* conditions and offers the respondent a 7-point Likert scale anchored by the phrases “strongly agree” and “strongly disagree”.

The survey instrument was qualitatively pretested by purchasing professionals as well as business research academics who have been actively involved in organizational behavior research. The empirical pretest of the instrument involved a randomly selected group of purchasing managers working in SICs 35, 36, 37, and 38. This pretest sample was drawn from the membership of the Central Pennsylvania Chapter of the National Association of Purchasing Management. According to the membership rolls of this chapter, there are currently 66 members who meet the requirements of the survey. As a member of this chapter, the author was able to secure a high level of participation. Twenty-two members responded to the pre-test sample. Based upon their responses and comments, the survey was slightly modified to increase readability and potentially enhance response rates. The pretest responses were not used in the empirical analysis.

Psychometric Assessments

In any research study two major problems of measurement need to be addressed: reliability and validity. Reliability refers to the accuracy or precision of a measure (Kerlinger 1986), while validity is an assessment of whether or not what was intended to be measured is in fact measured (DeVellis 1991). A classic means of distinguishing between reliability and validity was suggested originally by Campbell and Fiske (1959). According to these researchers, reliability is the agreement between two efforts to measure the same trait through *maximally-similar* means. Validity, on the other hand, is the agreement between two efforts to measure the same trait through *maximally-divergent* methods. Three major types of validity are considered in the methodology literature: content validity, criterion validity, and construct validity.

The first of these categories is content validity, or the qualitative assessment of the instrument in terms of representing the domain under investigation. In theory, content validity is achieved when the scale items which have been selected are a randomly chosen subset of the universe of appropriate items. Content validity is deemed to be established implicitly by the qualitative pre-testing of the survey questionnaire on the panel of experts (DeVellis 1991).

The second type of validity is criterion validity, which measures the degree of correspondence between a measure and a criterion variable. In the methodology literature, criterion validity is considered to be more of a practical rather than a scientific issue. This is because a criterion validity does not imply a causal relationship among variables, rather only a predictive relationship. Criterion validity may be established by high inter-item and item-to-total correlations (DeVellis 1991).

An assessment of construct validity refers directly to the theoretical relationship between variables of interest. DeVellis (1991) defined construct validity as “the extent to which a measure ‘behaves’ the way that the construct it purports to measure should behave with regard to established measures of other constructs” (p. 46). More formally put, construct validity refers to the extent to which differences in observed measurement scores reflect true differences in the characteristic being measured (Dillon, Madden, and Firtle 1987). The presence of nonrandom error is at the heart of construct validity. Consequently, nonrandom error may result in scale items representing something other than the intended construct, thereby violating the principle of construct validity. Factor analytic strategies are a classic method for examining construct validity (Dillon, Madden, and Firtle 1987).

Reliability has been considered as one of the fundamental issues in psychological measurement (DeVellis 1991). Lay definitions equate reliability with notions of consistency and stability, and these connotations may be extended to the methodological use of the term. More formally, scale reliability refers to the proportion of variance attributable to the true score of the latent variable. Consequently, the general approach for assessing reliability involves a determination of the proportion of systematic variation present in a measurement scale (Dillon, Madden, and Firtle 1987). While test-retest reliability is beyond the scope of the present study, internal consistency reliability is generally of significant interest in survey research. Internal consistency reliability focuses upon the homogeneity of the items which make up the scale (DeVellis 1991). Consequently, a scale is considered internally consistent to the extent that its member items are highly inter-correlated. Although there are a number of ways in which internal

consistency reliability may be approached, Cronbach's Alpha is the most commonly accepted formula for examining the internal consistency of a multi-item measurement scale (Dillon, Madden, and Firtle 1987).

Response Rates and Non-Response Bias

The detection of potential non-response bias is an essential safeguard to establishing the validity of the collected data (Creswell 1994). Response bias has been defined by Fowler (1988) as the effect of non-responses on survey estimates. The response rate will be calculated as a ratio following the example suggested by Babbie (1990):

$$\frac{\text{completed responses} + \text{refusals}}{\text{completed responses} + \text{refusals} + \text{undeliverables} + \text{non-responses}}$$

In order to evaluate potential non-response bias, the responses of purchasing managers received from the first mailing wave will be compared to those from the second mailing wave. By definition, non-response bias can be lessened by increasing response rates. The issue of non-response rates can be examined by verifying the degree of congruence between the first and second waves on variables of interest.

Analyses

The data generated from the research questionnaires will be analyzed using descriptive, inferential, and analysis of variance (ANOVA) techniques. Analysis of variance models have been described in the methodology literature as one of the most versatile of statistical tools for studying the relationship between a dependent variable and one or more independent variables (Neter, Kutner, Nachtsheim, and Wasserman 1996). A key strength of ANOVA as a statistical technique is its non-reliance upon assumptions regarding the nature of the functional relationship between the independent and dependent variables. Furthermore, ANOVA techniques do not require that the independent variables be quantitative as is the case with regression models. Indeed, analysis of variance represents a distinct statistical methodology in that the structure of the independent variables permits computational simplifications that are explicitly recognized in the statistical procedures for analysis of variance (Brown 1980).

Analysis of variance techniques in general and ANOVA Model I in particular require three assumptions. The first of these assumptions requires that each probability distribution is normal. The second of these assumptions requires that each probability distribution have the same variance. The third ANOVA assumption requires that the responses for each factor level are random selections from the corresponding probability distribution and are independent of the responses for any other factor level (Neter, Kutner, Nachtsheim, and Wasserman 1996). If the assumptions of the ANOVA model can be upheld, the analysis proceeds to a determination of whether or not the factor level means are the same. If these factor level means differ, the researcher may then examine

how they differ and the implications of these differences.

A detailed presentation of the appropriate analysis for each of the proposed hypotheses is depicted in the accompanying table (Table 10).

Table 10: Hypotheses, Items, and Statistical Analysis

H1a: Industrial purchasing managers' global attitudes should significantly differ toward pioneer brands, early followers, and late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
B.1	PIO	mean
B.2	EAR	mean
B.3	LAT	mean
B.1, B.2, B.3	PIO, EAR, LAT	ANOVA

H1b: Specifically, industrial purchasing manager attitudes should be most favorable toward pioneers, followed respectively by early followers and then late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
B.1, B.2	PIO-EAR	mean difference & paired t-statistic
B.1, B.3	PIO-LAT	mean difference & paired t-statistic
B.2, B.3	EAR-LAT	mean difference & paired t-statistic
B.1, B.2, B.3	PIO, EAR, LAT	Tukey

H2a: Industrial purchasing managers' attitudes as measured by the multiattribute attitude model should significantly differ toward pioneer brands, early followers, and late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D, F, H	PIO	mean
D, F, H	EAR	mean
D, F, H	LAT	mean
D, F, H	PIO, EAR, LAT	ANOVA

H2b: Specifically, industrial purchasing manager attitudes should be most favorable toward pioneers, followed respectively by early followers and then late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D, F, H	PIO-EAR	mean difference & paired t-statistic
D, F, H	PIO-LAT	mean difference & paired t-statistic
D, F, H	EAR-LAT	mean difference & paired t-statistic
D, F, H	PIO, EAR, LAT	Tukey

H3a: Industrial purchasing managers believe that pioneer firms have greater levels of technological leadership than do early followers and late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D.1, F.1, F.2	PIO-EAR	mean difference & Tukey
D.1, F.1, F.3	PIO-LAT	mean difference & Tukey
D.1, F.2, F.3	EAR-LAT	mean difference & Tukey

H3b: Industrial purchasing managers believe that pioneer products are of higher relative quality than those of early followers and late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D.2, F.4, F.5	PIO-EAR	mean difference & Tukey
D.2, F.4, F.6	PIO-LAT	mean difference & Tukey
D.2, F.5, F.6	EAR-LAT	mean difference & Tukey

H3c: Industrial purchasing managers believe that pioneer firms offer relatively broader product lines than do early followers and late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D.3, F.7, F.8	PIO-EAR	mean difference & Tukey
D.3, F.7, F.9	PIO-LAT	mean difference & Tukey
D.3, F.8, F.9	EAR-LAT	mean difference & Tukey

H3d: Industrial purchasing managers believe that the use of pioneer components and technologies will enhance the competitiveness of their own firms' products.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D.4, F.10, F.11	PIO-EAR	mean difference & Tukey
D.4, F.10, F.12	PIO-LAT	mean difference & Tukey
D.4, F.11, F.12	EAR-LAT	mean difference & Tukey

H3e: Industrial purchasing managers believe that greater confidence should be placed with firms that have been in business longer within the relevant product category. Consequently, greater confidence should be placed in pioneer firms, followed respectively by early followers and then late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D.5, H.1, H.2	PIO-EAR	mean difference & Tukey
D.5, H.1, H.3	PIO-LAT	mean difference & Tukey
D.5, H.2, H.3	EAR-LAT	mean difference & Tukey

H3f: Industrial purchasing managers believe that early followers are more likely to reduce the firm's dependence on a sole supplier than are late entrants or pioneers.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
D.6, H.4, H.5	PIO-EAR	mean difference & Tukey
D.6, H.4, H.6	PIO-LAT	mean difference & Tukey
D.6, H.5, H.6	EAR-LAT	mean difference & Tukey

H4a: Industrial purchasing managers perceptions of pioneer brands will be significantly more favorable on multiattribute subjective dimensions relative to early followers.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
C, E, G	PIO-EAR	mean difference & paired t-statistic
C, E, G	PIO, EAR,	MANOVA

H4b: Industrial purchasing managers perceptions of pioneer brands will be significantly more favorable on multiattribute subjective dimensions relative to late entrants.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
C, E, G	PIO-LAT	mean difference & paired t-statistic
C, E, G	PIO, LAT	MANOVA

H5: For the industrial purchasing manager, pioneer brand image will more closely match ideal firm image than will that of early followers.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
C, E, J	PIO-EAR	mean difference & paired t-statistic
C, E, J	PIO, EAR	MANOVA

H6: Other things being equal, industrial purchasing managers prefer pioneer brands in terms of product purchase preference.

<u>Items</u>	<u>Variables</u>	<u>Statistical Analysis</u>
I	PIO-neutral	mean difference & paired t-statistic

CHAPTER IV

EMPIRICAL ANALYSES

In this chapter the results of the data analyses are presented over the course of four major sections. The initial discussion is focused on the issue of response rates, which is an important dimension of survey-based research. A consideration of non-response bias is addressed in the second section. This is followed by the third section which contains the presentation of the reliability and validity analyses. The fourth and final section evaluates the results of the hypotheses testing.

Response Rates

The membership rolls of the National Association of Purchasing Management (NAPM) formed the basis of the sampling frame for this research study. This sampling frame included the names and mailing addresses of approximately 6000 industrial purchasing managers within the four SIC groups which constituted the research setting of this investigation. A final sample of 1000 purchasing executives balanced across SIC groups 35, 36, 37, and 38 was randomly chosen from the NAPM sample frame using a random number generator. Consequently, each of the four selected industrial classifications was represented by 250 randomly chosen members of the National Association of Purchasing Management. The first mailing of 1000 survey packages on

September 22, 1998 yielded 179 responses within the four-week cycle. In addition, three survey questionnaires were returned as undeliverable. Those who had not responded to the initial survey were identified and on October 21, 1998 an additional survey package was mailed to each of these 818 individuals. An additional 74 responses from this second mailing were received by December 22, 1998. Consequently, across both the first and second waves of mailings a final total of 253 responses was received. As can be seen in the accompanying table (Table 11), the total response rate was 25.3 %.

Of the 253 responses received, 18 were discarded from analysis because the respondents opted not to participate in the research project. The reasons offered for non-participation included retirement from active purchasing management, reassignment to non-purchasing activities, a lack of experience in purchasing materials and components, and corporate policies regarding non-disclosure. The elimination of these non-participating respondents resulted in a potentially usable sample size of 235. Sixty-four of these respondents belonged to the electrical equipment manufacturing industry (SIC 35), 55 to the machinery manufacturing industry (SIC 36), 61 to the transportation equipment industry (SIC 37), and 55 to the measuring instrumentation industry (SIC 38). Of the 235 potentially-usable responses, two were eliminated due to extensive missing values in the returned questionnaires and two observations were discarded due to anchored responses in the semantic differential portions of the questionnaire. In summarizing the issue of response rate, a final yield of 23.1% (231/1000) was recorded. Consequently, the research hypotheses were tested with a final sample size of 231 observations.

Table 11: Summary of Survey Response Rates

<u>Stage</u>	<u>Number of Surveys</u>
First mailing	1000
Responses received	179
Undeliverable	3
Second mailing	818
Responses received	74
Total responses received	253
Potentially usable responses	235
Anchored responses	2
Missing Values	2
Final survey yield	231

Non-Response Bias

Non-response bias in two-wave studies can be assessed by comparing the responses of the first wave with that of the second. One of the traditional approaches to this problem is to compare the demographic characteristics across the two waves (Armstrong and Overton 1977). To this end, demographic data relating to the firms which made up the sample was collected. The variables of interest in this case were annual sales revenue of the firm, number of employees within the strategic business unit, and the Standard Industrial Classification (SIC) of the firm. Comparing these descriptive characteristics of the responding firms in the first and second wave revealed little or no evidence of non-response bias. The results of the between-waves comparisons of means are shown in Table 12 together with the distributions of response by SIC. The t-test results indicate that differences in variable means are not significantly different across the waves, suggesting an overall absence of non-response bias in the data.

Table 12: Assessment of Non-Response Bias - Demographic

<u>Treatments</u>	<u>Sales*</u>	<u>Employees</u>	<u>Percentage of Responses</u>			
			<u>SIC 35</u>	<u>SIC 36</u>	<u>SIC 37</u>	<u>SIC 38</u>
First Wave	1064	1794	26.7	23.0	26.7	23.6
Second Wave	795	1246	28.8	24.2	24.2	22.8
$p > t$	0.113	0.139				

* in millions

As a further examination of potential non-response bias, perceptual responses toward order of entry from the first wave (n = 165) were compared against the second wave (n = 66). The results of this between-waves comparison of global attitudinal means are presented in Table 13. The t-test results indicate that differences in these perceptual evaluations of order of entry are not significantly different across the two waves, again suggesting a lack of non-response bias in the data. Consideration was given to an examination of potential non-response bias within the SIC categories. However, the small number of second-wave respondents within each category - 18 (SIC 35), 16 (SIC 36), 16 (SIC 37), and 15 (SIC 38) - made the results of such an analysis problematic.

Table 13: Assessment of Non-Response Bias - Perceptual

<u>Treatments</u>	<u>Pioneer</u>	<u>Early Follower</u>	<u>Late Entrant</u>
First Wave	0.59	0.96	0.47
Second Wave	0.77	0.82	0.56
$p > t$	0.243	0.339	0.664

Psychometric Assessments

The importance of scale reliability and validity was emphasized in the previous discussion of methodology. Reliability is traditionally assessed by Cronbach's Alpha, which is a technical measure of internal consistency. A critical assumption associated with the use of Cronbach's Alpha is the unidimensionality of the scale. A unidimensional scale is one in which the indicants of the construct measure it equally as well. Therefore, Cronbach's Alpha provides the upper boundary of scale reliability. Two major types of validity are relevant in the psychometric assessment of data collected via the use of

scales: criterion validity and construct validity. Criterion validity is traditionally examined through an analysis of relevant correlation coefficients. Causality is not at issue in examining criterion-related validity. Validity is established based solely upon the strength of the empirical relationship between the measure and its criterion. On the other hand, construct validity is directly concerned with the relationship between the measure and its related construct. Factor analysis is a well-established procedure for examining construct validity.

Reliability

The Windows 6.1 version of the Statistical Package for the Social Sciences (SPSS) was used to generate the reliability analysis of the semantic differential scales. These scales were utilized to elicit respondent perceptions of pioneer, early follower, and late entrant status as well as respondent perceptions of ideal firm image. As discussed in the previous chapter, these scales have an extensive tradition in the marketing literature. The results of this analysis are available in the following tables (Tables 14, 15, 16, and 17). The initial focus of this discussion will center on an evaluation of the scale reliabilities for order-of-entry status. Reliability analysis of the pioneer status scale is detailed in Table 14, while Tables 15 and 16 provide the reliability analyses of the early follower and late entrant status scales, respectively. The scale reliability of ideal firm image is presented in Table 17. The scale reliabilities for all of the semantic differential sections were relatively satisfactory with the possible exception of the pioneer status

scale. In *Scale Development: Theory and Applications* (1991), DeVellis suggested the following guidelines in interpreting Cronbach's Alpha scores: "below .60, unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80, respectable; between .80 and .90, very good" (p. 85). With a Cronbach's Alpha reading of 0.57, the reliability of the pioneer status scale appears significantly lower than the overall reliability scores for early follower status (0.77) and later entrant status (0.76). An iteration of the scale reliability analysis based upon the deletion of individual items indicated that the Cronbach's Alpha readings could be significantly improved across all three scales with the elimination of certain common items. Two potential candidates for deletion were identified: product pricing (Not Expensive - Expensive) and product complexity (Complex - Simple). Deletion of the product pricing item resulted in the dramatic improvement of the pioneer status score from 0.57 to 0.67. The elimination of this item also improved the Cronbach's Alpha scores of the early follower scale from 0.77 to 0.82 and the late entrant scale from 0.76 to 0.80. The deletion of the product complexity item substantially improved the reliability of the pioneer scale from 0.57 to 0.65. Deletion of this item from the early follower scale improved its Cronbach's Alpha score from 0.77 to 0.82 and the late entrant scale from 0.76 to 0.82. Another potential candidate for deletion in the pioneer status scale was also identified. The product conformance (Not Conforming - Conforming) item's elimination from the pioneer scale would result in an improvement in the Cronbach's Alpha reading from 0.57 to 0.67 but its elimination in the other scales would result in a decline in their respective Cronbach's Alpha scores. Aside from the aforementioned items, the rest of the individual indicants were closely aligned with their respective constructs.

Table 14: Reliability Analysis of Pioneer Semantic Differential Scale
Pioneer Scale Reliability: Cronbach's Alpha: 0.57

Cronbach's Alpha if Item Deleted

C1:	Product Quality	0.52
C2:	Product Distinctiveness	0.55
C3:	Product Usefulness	0.52
C4:	Product Goodness	0.49
C5:	Product Pricing	0.67
C6:	Product Importance	0.50
C7:	Product Conformance	0.67
C8:	Product Technology	0.52
C9:	Product Reliability	0.53
C10:	Product Complexity	0.65
C11:	Product Excitement	0.53
C12:	Product Sophistication	0.51
C13:	Product Superiority	0.48

Table 15: Reliability Analysis of Early Follower Semantic Differential

Early Follower Scale Reliability: Cronbach's Alpha: 0.77

Cronbach's Alpha if Item Deleted

E1:	Product Quality	0.74
E2:	Product Distinctiveness	0.77
E3:	Product Usefulness	0.74
E4:	Product Goodness	0.73
E5:	Product Pricing	0.82
E6:	Product Importance	0.74
E7:	Product Conformance	0.74
E8:	Product Technology	0.75
E9:	Product Reliability	0.75
E10:	Product Complexity	0.82
E11:	Product Excitement	0.75
E12:	Product Sophistication	0.74
E13:	Product Superiority	0.73

Table 16: Reliability Analysis of Late Entrant Semantic Differential Scale

Late Entrant Scale Reliability: Cronbach's Alpha: 0.76

Cronbach's Alpha if Item Deleted

G1:	Product Quality	0.72
G2:	Product Distinctiveness	0.77
G3:	Product Usefulness	0.72
G4:	Product Goodness	0.72
G5:	Product Pricing	0.80
G6:	Product Importance	0.72
G7:	Product Conformance	0.72
G8:	Product Technology	0.72
G9:	Product Reliability	0.71
G10:	Product Complexity	0.82
G11:	Product Excitement	0.75
G12:	Product Sophistication	0.73
G13:	Product Superiority	0.71

With a Cronbach's Alpha reading of 0.67, the scale reliability of the ideal firm image scale could be considered "minimally acceptable" using DeVellis' (1991) interpretation. As was the case with the previously considered scales, an iteration of the scale reliability analysis based upon the deletion of individual items indicated that the Cronbach's Alpha reading could be significantly improved. Once again, the product complexity indicant was identified as a candidate for potential elimination. Its deletion would result in an improvement of the Cronbach's Alpha score from 0.67 to 0.80. As can be seen in Table 17, the other items appear to be in line with the overall construct.

Table 17: Reliability Analysis of Ideal Firm Image Semantic Differential

Ideal Firm Image Scale Reliability: Cronbach's Alpha: 0.67

Cronbach's Alpha if Item Deleted

J1:	Product Distinctiveness	0.58
J2:	Product Importance	0.60
J3:	Product Conformance	0.66
J4:	Product Technology	0.57
J5:	Product Excitement	0.60
J6:	Product Complexity	0.80
J7:	Product Sophistication	0.58

In summary, the results of the scale reliability analysis appear reasonably satisfactory across all four scales with the possible exception of the pioneer status scale. Previous research efforts (Alpert and Kamins 1995) have reported higher Cronbach's Alpha readings, although it should be noted that these efforts have been confined to consumer rather than industrial purchasing audiences. Given the dampening effect of the product complexity item across all four scales, and particularly its depressing effect on the pioneer status scale reliabilities, a decision was made to delete the item. The immediate consequence of this action was, to borrow DeVellis's (1991) terminology, the enhancement of scale reliability in the pioneer status scale from "unacceptable" (0.57) to "minimally acceptable" (0.65). Furthermore, the deletion of the product complexity item

simultaneously enhanced the scale reliabilities of the early follower, late entrant, and ideal firm image scales. Reliability of the early follower status scale was increased from “respectable” (0.77) to “very good” (0.82) as was the reliability of the late entrant status scale, which improved from “respectable” (0.76) to “very good” (0.82). Ideal firm image reliability was also enhanced from “minimally acceptable” (0.67) to “very good” (0.80). By these standards, the scale reliabilities of the semantic differential measures should be considered as adequate.

Validity

The issue of criterion validity was examined through the bivariate correlation function available in the Windows 6.1 version of the Statistical Package for the Social Sciences (SPSS). Two areas of interest were identified. The first of these involved an examination of criterion validity between the multiattribute attitude model and the single-item measures of global attitude. The second focused on the presence of concurrent validity between the semantic differential scales and the single-item measures of global attitude. As can be seen in the accompanying table (Table 18), mean differences in global attitude toward entry order were correlated with mean differences in entry order attitude drawn from the multiattribute attitude model.

**Table 18:
Correlation of Global and Multiattribute Attitudinal Differences
Toward Order of Entry**

<u>Order of Entry</u>	<u>Global Mean</u>	<u>Multiattribute Mean</u>	<u>Correlation Coefficient</u>	<u>Prob t H: r = 0</u>
PIO - EAR	-0.268	-5.89	0.20	0.002
EAR - LAT	0.424	15.78	0.27	< 0.000
PIO - LAT	0.156	9.88	0.20	0.002

The Pearson correlation coefficient may be regarded as a measure of linear association between two variables, in this case, global and multiattribute attitudinal differences toward order of entry. The absolute values of the correlation coefficients indicate the strength of the linear relationship between the variables. Although the test results in each of the three cases clearly reject the null hypothesis that there is no correlation, the correlation coefficients are not as strong as might be desired. In *Belief, Attitude, Intention, and Behavior* (1980), Fishbein and Ajzen suggest that a satisfactory threshold of criterion validity for multiattribute attitude models begins with correlations in the range of 0.30.

In a similar fashion, the second phase of the criterion validity analysis focused on mean attitudinal differences between pioneers and early entrants in the semantic differential portions of the instrument. The following table (Table 19) outlines the correlations between semantic differential mean differences and global attitudinal mean differences:

Table 19:
Correlation of Semantic Differential vs. Global Attitudinal
Differences: PIO - EAR

<u>Scale Item</u>	<u>Semantic Differential</u>	<u>Global Attitude</u>	<u>Correlation Coefficient</u>	<u>Prob H: r = 0</u>
Poor Quality - High Quality	-0.29	0.20	0.13	0.047
Not Distinctive - Very Distinctive	1.00	0.20	0.16	0.012
Useless - Useful	0.12	0.20	0.16	0.019
Bad - Good	-0.74	0.20	0.07	0.283
Expensive - Inexpensive	-1.57	0.20	-0.14	0.030
Unimportant - Important	0.28	0.20	0.09	0.154
Not Conforming - Conforming	-0.86	0.20	-0.13	0.053
Low Tech - High Tech	0.44	0.20	0.11	0.094
Unreliable - Reliable	-0.67	0.20	0.07	0.307
Dull - Exciting	0.65	0.20	0.12	0.069
Unsophisticated - Sophisticated	0.48	0.20	-0.01	0.885
Inferior - Superior	-0.03	0.20	0.11	0.109

As can be seen from the test results, in five of the twelve correlations the null hypothesis that there is no correlation was clearly rejected at the 0.05 level. At the less rigorous 0.10 level, the null hypothesis was rejected in eight of the twelve correlations. As was the case when examining the criterion validity between global and multiattribute attitudinal differences, higher correlation scores would have been more desirable. Nevertheless, the preceding results indicate that a level of criterion validity can be detected between the semantic differential and global measures of attitude toward order of entry.

The issue of construct validity goes to the theoretical relationship between the measure and its underlying construct. Despite the extensive use of the brand attitude

semantic differential scale in previous research, Bruner and Hensel (1992) offer virtually no information regarding attempts to assess its construct validity. The limited guidance that has been made available suggests the use of factor analytic strategies (Iyer 1988; Alpert and Kamins 1995). It is the contention of this study that underlying the semantic differential scale are three distinct constructs: attitude toward the pioneer brand, attitude toward the early follower brand, and attitude toward the late entrant brand. Thus, evidence of divergence in the factor loadings across the three administrations of the scale would be supportive of construct validity.

Factor analysis on the three versions of the semantic differential scale was conducted through the Windows 6.1 version of the Statistical Package for the Social Sciences (SPSS). Several factor solutions were attempted in an effort to minimize cross-loadings while maximizing cumulative variance. A principal components analysis of the pioneer semantic differential items resulted in a two-factor solution as can be seen in the accompanying table (Table 20):

Table 20: Factor Analysis of Pioneer Semantic Differential

<u>Variable</u>	<u>Communality</u>	<u>Factor</u>	<u>Eigenvalue</u>	<u>Percentage Variance</u>	<u>Cumulative Variance</u>
Conformance	0.418	1	4.272	35.6	35.6
Distinctiveness	0.279	2	1.927	16.1	51.7
Excitement	0.432				
Pricing	0.433				
Goodness	0.489				
Importance	0.585				
Quality	0.627				
Sophistication	0.568				
Superiority	0.606				
Technology	0.587				
Reliability	0.658				
Usefulness	0.518				

This initial solution was then subjected to an orthogonal *varimax* rotation which converged in three iterations. The resulting factor matrix is presented in Table 21. A distinct pattern of factor loadings is evident from the data. Product technology, sophistication, importance, pricing, excitement, and distinctiveness load on the first factor while product reliability, quality, superiority, and conformance load on the second.

Table 21: Factor Matrix of Pioneer Semantic Differential

	<u>Factor 1</u>	<u>Factor 2</u>
Technology	.757	.118
Sophistication	.745	.114
Importance	.703	.299
Pricing	-.635	.171
Excitement	.630	.186
Distinctiveness	.528	.011
Reliability	-.081	.807
Quality	.025	.791
Superiority	.398	.669
Conformance	.381	.645
Usefulness	.498	.519
Goodness	.476	.513

Proceeding with the examination, a principal components analysis of the early follower semantic differential items resulted in a three-factor solution as illustrated in the accompanying table (Table 22):

Table 22: Factor Analysis of Early Follower Semantic Differential

<u>Variable</u>	<u>Communality</u>	<u>Factor</u>	<u>Eigenvalue</u>	<u>Percentage Variance</u>	<u>Cumulative Variance</u>
Conformance	0.723	1	4.815	40.1	40.1
Distinctiveness	0.540	2	1.492	12.4	52.6
Excitement	0.662	3	1.047	8.7	61.3
Pricing	0.684				
Goodness	0.569				
Importance	0.629				
Quality	0.637				
Sophistication		0.504			
Superiority	0.599				
Technology	0.555				
Reliability	0.615				
Usefulness	0.637				

Similar to the previous example, an orthogonal *varimax* rotation of the initial solution was undertaken. The resulting factor matrix converged in five iterations and is presented in Table 23. A distinctly different pattern of factor loadings is evident from this data. Product conformance, importance, superiority, goodness, and technology load on the first factor while product quality, usefulness, reliability, and excitement load on the second. Product pricing and distinctiveness load on the third factor.

Table 23: Factor Matrix of Early Follower Semantic Differential

	<u>Factor 1</u>	<u>Factor 2</u>	<u>Factor 3</u>
Conformance	.831	.151	-.092
Importance	.669	.143	.401
Superiority	.652	.382	.168
Goodness	.651	.353	.147
Technology	.623	.171	.371
Quality	.222	.759	.111
Usefulness	.267	.752	-.005
Reliability	.278	.729	-.081
Excitement	.052	.666	.464
Pricing	-.065	.076	-.821
Distinctiveness	.187	.107	.703
Sophistication	.408	.354	.461

Finally, a principal components analysis of the late entrant semantic differential items resulted in a two-factor solution as can be seen in the accompanying table (Table 24):

Table 24: Factor Analysis of Late Entrant Semantic Differential

<u>Variable</u>	<u>Communality</u>	<u>Factor</u>	<u>Eigenvalue</u>	<u>Percentage Variance</u>	<u>Cumulative Variance</u>
Conformance	0.547	1	4.875	40.6	40.6
Distinctiveness	0.526	2	1.618	13.5	54.1
Excitement	0.325				
Pricing	0.461				
Goodness	0.432				
Importance	0.582				
Quality	0.653				
Sophistication	0.509				
Superiority	0.569				
Technology	0.599				
Reliability	0.693				
Usefulness	0.595				

Once again, this initial solution was subjected to an orthogonal *varimax* rotation which converged in three iterations. The resulting factor matrix is presented in Table 25. A distinctive pattern of factor loadings very different from the two previous examples is evident from the data. Product reliability, quality, usefulness, conformance, superiority, and goodness load on the first factor while product distinctiveness, pricing, sophistication, and excitement load on the second. While admittedly less than ideal, the pattern that emerges from this series of data reduction exercises provides evidence of divergent validity and suggests that assumptions regarding the presence of congruent validity are reasonable.

Table 25: Factor Matrix of Late Entrant Semantic Differential

	<u>Factor 1</u>	<u>Factor 2</u>
Reliability	.830	.058
Quality	.807	.032
Usefulness	.767	.082
Conformance	.736	.073
Superiority	.645	.390
Goodness	.631	.186
Distinctiveness	-.053	.723
Pricing	.073	-.675
Sophistication	.369	.611
Excitement	.219	.527
Importance	.536	.544
Technology	.554	.541

Hypotheses Testing

Hypothesis H1

As indicated earlier, the primary research focus of this study centers on whether, in fact, industrial purchasing managers do hold different attitudes towards brands based upon their order of entry. Consequently, the first research hypothesis (H1) was designed to examine differences in global attitude toward order of entry in an industrial context. Specifically, H1a stated that industrial purchasing managers' global attitudes toward pioneer brands, early followers, and late entrants should significantly differ. This construct of global attitude was formulated through a straight-forward, single-item elicitation of overall respondent attitude toward each category of order entry. Respondents were asked to state their attitude toward each of the three order entry categories using a seven-point Likert scale which ranged from "extremely negative" (-3) to "extremely favorable" (+3). The means for each of the three categories of order entry can be seen in the accompanying table (Table 26). A one-way analysis of variance conducted across the three category means revealed significant differences ($F = 61.72$, $p < 0.000$).

<u>Order of Entry</u>	<u>n</u>	<u>Mean</u>
Pioneer	231	0.654
Early Follower	231	0.922
Late Entrant	231	0.498

The next stage in the empirical analysis of H1a examined the differences in category means. The central issue here was whether differences in category means were statistically different than zero. As can be seen in Table 27, statistically significant differences in global attitude were detected between pioneers and early followers. A statistically significant difference in global attitude was also found between early followers and late entrants. However, although a difference in means between pioneers and late entrants was noted, this difference was not statistically significant ($p = 0.237$). The results of these univariate tests were replicated when the Tukey procedure was employed. The Tukey method evaluates the set of all pairwise comparisons. Consequently, differences in means between pioneers and late entrants could not be supported. Nevertheless, on the critical issue of perceptual distinction between pioneers and early followers H1a is strongly supported.

<u>Order of Entry</u>	<u>n</u>	<u>Mean</u>	<u>t</u>	<u>Prob t</u> <u>H: Mean = 0</u>
Pioneer - Early Follower	231	-0.268	-3.11	0.002
Early Follower - Late Entrant	231	0.424	4.44	< 0.000
Pioneer - Late Entrant	231	0.156	1.19	0.237

The second sub-hypothesis (H1b) stipulated that the global attitude of industrial purchasing managers would favor the pioneer brand, followed respectively by early followers and then late entrants. As indicated in Table 27, while the mean difference between pioneers and early followers is significant ($t = -0.268, p = 0.002$) the direction is the reverse of the hypothesis. The hypothesis that early followers would be viewed more positively than late entrants was supported by the data ($t = 4.44, p < 0.000$). The results of the study clearly suggest that respondents hold a more favorable global attitude towards early followers, followed by both pioneers and then late entrants. Consequently H1b and its predicted directional bias toward first movers was not supported in this research setting.

Hypothesis H2

The second hypothesis (H2) was designed to test whether statistically significant differences in industrial purchasing managers' attitudes toward order of entry could be detected by means of the multiattribute attitude model. As has been previously discussed, multiattribute attitude models have proven highly robust in terms of predicting global attitude as well as purchasing intention and have an extensive tradition in the marketing research literature (Wilkie and Pessemier 1973). A measure of attribute importance was obtained for each of the six components of the multiattribute attitude model utilizing a seven-point Likert scale (1 to 7). These six components included measures which were designed to elicit respondent beliefs and perceptions regarding the role of order of entry and technological leadership, relative product quality, breadth of product line, the ability to enhance firm competitiveness, supplier business longevity, and

the ability to reduce firm dependence upon a single supplier. For each of these six components a likelihood measure based upon a seven-point Likert scale (1 to 7) was obtained for each of the three order-of-entry categories. Each of these six likelihood measures was then multiplied by the corresponding importance measure or weight. Adding these six products together resulted in a multiattribute attitude model score for each of the categories of entry order. Based upon the final yield of 231 respondents, Table 28 depicts the means for each of the three order entry categories. A one-way analysis of variance conducted across the three category means revealed significant differences ($F = 1954.32, p < 0.000$).

Table 28:
Multiattribute Attitude Toward Order of Entry

<u>Order of Entry</u>	<u>n</u>	<u>Mean</u>
Pioneer	231	145.48
Early Follower	231	151.37
Late-Entrant	231	135.59

As was the case with the single-item measures of global attitude previously discussed, statistically significant mean differences between categories were found in the multiattribute attitude model. The mean differences between entry order categories are displayed in Table 29 together with their respective t-statistics and t-tests. As can be seen, the multiattribute attitude model yielded similar results to the global attitude model with regards to the mean differences between pioneers and early followers as well as early followers and late entrants. Unlike the results obtained when measuring global

attitude, the multiattribute attitude model provided statistically significant support for differences in attitude between pioneers and late entrants ($t = 4.43, p < 0.000$). The results of these tests provide confirmation that industrial purchasing managers hold distinctly different attitudes towards brands based upon their order of entry and clearly support H2a.

In a manner consistent with the form of first hypothesis (H1), the second hypothesis (H2) also raised the issue of industrial purchasing manager order-of-entry preference. Specifically, H2b stipulated that industrial purchasing managers' attitudes as measured by the multiattribute attitude model would favor the pioneer brand, followed respectively by the early follower and the late entrant. As is evident in Table 29, the data clearly demonstrate that attitudinal preference as measured by the multiattribute attitude model is extended to the early follower rather than the pioneer. Furthermore, this preferential attitudinal difference is statistically significant ($t = -3.86, p < 0.000$). Consequently, H2b is not supported. However, as was the case with the earlier test of global attitude, respondents clearly favored early followers over late entrants as well as pioneers over late entrants. All pairwise comparisons were found to be significant at the 0.05 level as measured by the Tukey procedure. The consistency between the results of the global attitudinal difference measure and the multiattribute attitude model may be noted by comparing the results from Table 27 with Table 29.

Table 29:
Multiattribute Attitudinal Differences Toward Order of Entry

<u>Order of Entry</u>	<u>n</u>	<u>Mean</u>	<u>t</u>	<u>Prob t</u> <u>H: Mean = 0</u>
Pioneer - Early Follower	231	-5.89	-3.86	< 0.000
Early Follower - Late Entrant	231	15.78	9.06	< 0.000
Pioneer - Late Entrant	231	9.88	4.43	< 0.000

Hypothesis H3

The next level of analysis examined the issues raised by the six sub-hypotheses of H3. These six sub-hypotheses were designed to test the sources of attitudinal preference by examining each of the six beliefs regarding order of entry which formed the basis of the multiattribute attitude model. As has been previously discussed, the multiattribute attitude model is composed of an elicited importance measure which is multiplied by an elicited likelihood measure for each of the sub-components of the model for each of the three entry categories. The sum of these products may be interpreted as the multiattribute attitude score. The accompanying table (Table 30) portrays the data developed from the model including the mean importance measures for each of the six sub-components as well as the mean likelihood measures. The relative importance of higher relative quality (H3b) and the ability to enhance competitiveness (H3d) are clearly demonstrated by the data. The last three columns of the table contain the attitudinal scores for each of the three order entry categories:

**Table 30:
Multiattribute Attitude Analysis**

<u>Measures</u>	<u>Importance</u>	<u>Likelihood</u>			<u>Multiattribute Attitude Scores</u>		
		PIO	EAR	LAT	PIO	EAR	LAT
Industrial purchasing managers believe that PIO (EAR, LAT) possess...							
H3a: Technological leadership	5.78	5.56	5.03	4.27	32.12	29.07	24.67
H3b: Higher relative quality	6.56	4.74	4.99	4.76	31.06	32.71	24.67
H3c: Relatively broader product lines	4.62	3.50	4.22	4.70	16.16	19.50	21.72
H3d: Ability to enhance competitiveness	6.43	5.09	4.70	4.05	32.70	30.22	26.05
H3e: Business longevity	4.02	4.38	4.91	2.98	17.60	19.70	11.99
H3f: Ability to reduce supplier dependence	4.75	3.08	3.98	4.13	14.63	18.93	19.65

PIO = Pioneer
EAR = Early Follower
LAT = Late Entrant

The next phase of analysis involved an examination of the six sub-hypotheses that make up H3. The first of these sub-hypotheses (H3a) tested the belief that industrial purchasing managers perceive pioneer brands as possessing higher levels of technological

leadership than early followers or late entrants. As can be seen in the accompanying analysis of multiattribute attitudinal differences (Table 31), pioneers were perceived as clearly possessing higher levels of technological leadership than early followers or late entrants. In addition, the construct of technological leadership was perceived by respondents to be relatively important with a mean weighting of 5.78 out of a possible 7.00. Furthermore, all pairwise comparisons within each measure were found to be significant at the 0.05 level as measured by the Tukey procedure. This procedure is regarded as a conservative test of pairwise comparisons. Consequently, H3a was clearly supported by the data.

<u>Measures</u>	<u>Likelihood Differences</u>		
	PIO-EAR	EAR-LAT	PIO-LAT
Industrial purchasing managers believe that PIO (EAR, LAT) possess...			
H3a: Technological leadership	0.53	0.76	1.29
H3b: Higher relative quality	-0.25	0.22	-0.02*
H3c: Relatively broader product lines	-0.72	-0.48	-1.20
H3d: Ability to enhance competitiveness	0.39	0.65	1.03
H3e: Business longevity	-0.53	1.92	1.39
H3f: Ability to reduce supplier dependence	-0.90	-0.15	-1.06
PIO = Pioneer			
EAR = Early Follower			
LAT = Late Entrant			
* Not statistically significant with Tukey at $p = 0.05$			

The second sub-hypothesis (H3b) examined the role of perceived relative quality as a factor in determining order-of-entry preference. Drawing upon an extensive research literature (e.g., Robinson and Fornell 1985; Robinson 1988), H3b stipulated that industrial purchasing managers would characterize pioneer brands as having higher levels

seen in Table 31, survey respondents perceived the product quality of pioneer brands to be lower than that of early followers as well as late entrants. This discrepancy in perceived quality between early followers and pioneers was both substantial as well as statistically significant when tested with the Tukey procedure. However, the differential in perceived quality between late entrants and pioneers was both marginal as well as statistically insignificant ($p = 0.867$) when tested against the null hypothesis that the mean was actually zero. As a result of these findings, H3b was not supported.

The third sub-hypothesis (H3c) was designed to evaluate the issue of relative product line breadth. The order-of-entry research tradition embodied in H3c stipulated that one of the potential sources of first mover advantage was the relative breadth of product line associated with pioneers. Consequently, H3c sought to determine if industrial purchasing managers perceived pioneers as possessing relatively broader product lines. Contrary to the research tradition, the survey respondents believed that late entrants had the broadest product lines. Moreover, the discrepancy between pioneers and late entrants was both substantial (1.2 out of a potential 7) and statistically significant at the $p = 0.05$ level by the Tukey procedure. Early follower brands were also perceived to possess more product-line breadth than pioneers. Therefore, H3c was not supported by the survey data.

The fourth sub-hypothesis (H3d) sought to examine the perceived role of order entry in enhancing the competitiveness of the firm's final product. Specifically, H3d stipulated that industrial purchasing managers believed that pioneer products would enhance the firm's product more so than early followers or late entrants. Of the six sub-components of multiattribute attitude, this ability to enhance the firm's product

competitiveness was weighted as the most important by survey respondents. As presented in Table 31, industrial purchasing managers found that pioneer products were more likely to enhance the firm's product competitiveness. Based upon the Tukey procedure, this aspect of pioneer advantage was found to be substantial and statistically significant when compared to early followers as well as late entrants. Consequently, H3d was clearly supported by the survey data.

The fifth sub-hypothesis (H3e) stipulated that greater confidence should be placed with firms that had been in business longer within the relevant product category, i.e., the pioneer brand. At a mean weighting of 4.02 out of a possible 7.00, the issue of confidence based upon business longevity was found to be the least important of the six criteria that made up the multiattribute attitude model. Furthermore, survey respondents placed higher levels of confidence in the early follower as opposed to the pioneer. This mean confidence differential was found to be substantial (-0.53), as well as statistically significant when subjected to the Tukey procedure. As a result of these findings, H3e was not supported in the context of the research setting.

The sixth sub-hypothesis (H3f) sought to determine if industrial purchasing managers believed that additional entrants into a product category would reduce the firm's dependence upon a sole supplier. Specifically, H3f stipulated that survey respondents would find that early followers are more likely to reduce the firm's reliance upon sole suppliers than would late entrants or pioneers. The results of the Tukey analysis clearly demonstrate that industrial purchasing managers believe that late entrants are more likely than early followers or pioneers to reduce the firm's dependence upon a sole supplier. Consequently, H3f was not supported.

To briefly recapitulate the findings of the multiattribute model analysis, a total of six sub-hypotheses were tested in the course of the evaluation. Of these six sub-hypotheses, only two were clearly supported by the analysis. The first of the supported sub-hypotheses (H3a) examined the issue of technological superiority and found clear support for the contention that industrial purchasing managers believe that pioneer firms possess greater levels of technological leadership than do early followers or late entrants. The second of the supported sub-hypothesis (H3d) centered on the ability of pioneers to enhance the competitiveness of the firm's final product. The findings of the analysis clearly demonstrate support for this contention.

Hypothesis H4

The next phase of analysis approached the issue of attitude toward order of entry through a semantic differential format. Specifically, the fourth hypothesis tested the contention that industrial purchasing managers perceive pioneer brands more favorably on subjective dimensions relative to either early followers (H4a) or late entrants (H4b). As previously discussed, respondents were asked to record their subjective perceptions of order-of-brand entry based upon 12 bipolar semantic differential items drawn from the research literature. Survey responses to the 7-point Likert scale were then converted to a scale anchored on the negative pole with a rating of -3 and on the positive pole with a rating of +3. As can be seen in Table 32, responses toward pioneer status were compared with responses based upon early follower status and the mean differential, t-statistic, and t-test results were calculated. Statistically significant differences were noted on 9 of the 12 semantic differential items when respondent attitudes toward pioneer status were

compared with their attitudes toward early follower status. No statistically significant difference in attitude toward pioneers and early followers were detected on the following three scale items: Useless-Useful, Bad-Good, and Inferior-Superior.

Scale Item	Mean	PIO-EAR	
		t	Prob t
Poor Quality - High Quality	-0.29	-2.94	0.004
Not Very Distinctive - Very Distinctive	1.00	7.76	< 0.000
Useless - Useful	0.12	1.28	0.201
Bad - Good	-0.07	-0.72	0.473
Expensive - Inexpensive	-1.57	-13.46	< 0.000
Unimportant - Important	0.28	2.82	< 0.005
Not Conforming - Conforming	-0.86	-7.53	< 0.000
Low Tech - High Tech	0.44	3.90	< 0.000
Unreliable - Reliable	-0.67	-5.94	< 0.000
Dull - Exciting	0.65	6.81	< 0.000
Unsophisticated - Sophisticated	0.48	4.72	< 0.000
Inferior - Superior	-0.03	-0.31	0.755

PIO = Pioneer
EAR = Early Follower

Major distinctions in attitude between pioneer status and early follower status may be noted on the following semantic differential items. Analysis of the product distinctiveness scale (Not Very Distinctive - Very Distinctive) revealed a robust difference in mean attitude of 1.00 out of a possible 7.00 clearly demonstrating respondent recognition that pioneer products are significantly more distinct than early follower products. Conversely, the product pricing scale (Expensive-Inexpensive)

provides strong support for the contention that industrial purchasing managers perceive pioneer products as significantly more expensive than early followers (mean difference = -1.57). Of the nine scale items in which statistically significant differences in entry order attitude were noted, five revealed a favorable attitude toward first movers as opposed to early followers. These five scale items included the following: the product distinctiveness scale, the product importance scale (Unimportant-Important), the product technology scale (Low Tech - High Tech), the product excitement scale (Dull - Exciting), and the product sophistication scale (Unsophisticated-Sophisticated). The remaining four scale items in which respondents favored the early entrant consisted of the following: the product pricing scale, the product quality scale (Poor Quality - High Quality), the product conformance scale (Not Conforming - Conforming), and the product reliability scale (Unreliable - Reliable). As presented in Table 32, differences between entry order categories on these nine items were highly statistically significant. In order to test H4a, these nine items were utilized to construct a paired comparison t-test contrasting total semantic differential scores for pioneers with those of early followers. The mean difference of the total paired comparison was found to be -0.54. It should be noted that the direction of the findings is the reverse of the hypothesis. That is, based upon this semantic differential battery, industrial purchasing managers prefer early entrants to pioneers. A repeated-measures MANOVA was utilized to examine differences in responses to entry on the nine measures in question. The results of this analysis are presented below (Table 33) and these results demonstrate the statistical significance of differences between groups. Consequently, H4a was not supported.

Table 33: Multivariate Tests of Significance: PIO vs EAR

<u>Test Name</u>	<u>Value</u>	<u>F</u>	<u>Degrees of Freedom</u>		<u>F Statistic</u>
			<u>Between</u>	<u>Within</u>	<u>Significance</u>
Pillai's criterion	0.623	40.37	9	221	0.000
Hotteling's trace	1.651	40.37	9	221	0.000
Wilk's lambda	0.377	40.37	9	221	0.000
Roy's gcr	0.723				

The next phase of analysis (H4b) involved an examination of semantic differential mean differences between pioneers and late entrants. The mean differences between attitude toward pioneers and late entrants are presented in the accompanying table (Table 34), as are the relevant t-statistics and t-test results. When survey respondents compared pioneer status with late entry status, practical significant differences were noted for 11 of the 12 semantic differential categories. The only semantic differential item in which no statistically significant difference was found was the product worth scale (Bad - Good). Mean differences for the remaining 11 semantic differential items were highly statistically significant ($p < 0.05$) with the sole exception of the product quality item, which narrowly missed this level of statistical significance ($p = 0.054$). Overall, survey respondents associated a favorable rating with pioneer status as opposed to late entrant status on 7 of the relevant 11 semantic differential measures.

Table 34
Analysis of Semantic Differential Differences By Order of Entry

Scale Item	Mean	PIO-LAT	
		t	Prob t
Poor Quality - High Quality	-0.22	-1.86	0.054*
Not Very Distinctive - Very Distinctive	1.58	10.64	< 0.000
Useless - Useful	0.26	2.88	0.004
Bad - Good	0.10	1.12	0.265
Expensive - Inexpensive	-2.26	-16.57	< 0.000
Unimportant - Important	0.68	6.16	< 0.000
Not Conforming - Conforming	-0.91	-7.72	< 0.000
Low Tech - High Tech	0.92	7.84	< 0.000
Unreliable - Reliable	-0.71	-6.06	< 0.000
Dull - Exciting	1.07	10.31	< 0.000
Unsophisticated - Sophisticated	0.84	8.27	< 0.000
Inferior - Superior	0.27	2.57	0.011

PIO = Pioneer
LAT = Late Entrant
* Note marginal nature of significance

Pioneer status was favorably perceived on the following semantic differentials: product distinctiveness (Not Very Distinctive - Very Distinctive), product usefulness (Useless - Useful), product importance (Unimportant-Important), product conformance (Not Conforming - Conforming), product technology (Low Tech - High Tech), product excitement (Dull - Exciting), and product sophistication (Unsophisticated-Sophisticated). Substantial mean differences were noted on product distinctiveness (1.58), product pricing (-2.26), and product excitement (1.07). Paralleling the previous procedure, H4b

was tested by constructing a paired comparison t-test contrasting total semantic differential scores for pioneers with those of late entrants. The mean difference of the total paired comparison was found to be 0.64. It should be noted that, based upon this semantic differential battery, industrial purchasing managers expressed a preference for pioneers over late entrants. A repeated-measures MANOVA was then employed to examine differences in responses to entry on the eleven measures in question. The results of this analysis are presented below (Table 35) and these results demonstrate the statistical significance of differences between groups. Therefore H4b was supported.

Table 35: Multivariate Tests of Significance: PIO vs LAT

<u>Test Name</u>	<u>Value</u>	<u>F</u>	<u>Degrees of Freedom</u>		<u>F Statistic Significance</u>
			<u>Between</u>	<u>Within</u>	
Pillai's criterion	0.631	33.86	11	219	0.000
Hotteling's trace	1.709	33.86	11	219	0.000
Wilk's lambda	0.369	33.86	11	219	0.000
Roy's gcr	0.631				

Hypothesis H5

The next stage of analysis tested the hypothesis (H5) that, based upon semantic differential outcomes, ideal firm image would more closely resemble pioneer image rather than early follower or late entrant image. As discussed previously, respondents were asked to evaluate ideal firm image based upon 6 semantic differential items. The results of these ideal firm image semantic differentials were then compared with the

corresponding semantic differentials which had been used to evaluate differences in attitude toward order entry. Consequently, H5 stipulated that the absolute difference between pioneer image (PIO) and ideal firm image (IDEAL) would be less than the absolute difference between early follower image (EAR) and ideal firm image (IDEAL).

Mathematically, the equation may be stated as $|PIO - IDEAL| < |EAR - IDEAL|$. The results of this analysis is shown in the accompanying table (Table 36).

	<u>Mean Differences</u>	<u>t</u>	<u>Prob t</u>
Not Very Distinctive - Very Distinctive	-0.70	-5.43	<0.000
Unimportant - Important	-0.17	-1.71	0.090
Low Tech - High Tech	-0.23	-2.11	0.040
Dull - Exciting	-0.43	-4.61	<0.000
Unsophisticated - Sophisticated	-0.18	-1.93	0.050
Not Conforming - Conforming	0.63	5.92	<0.000

PIO = Pioneer
EAR = Early

Statistically significant differences in means are seen in only five of the six items. These five means were summed and then tested using a paired comparison t-test. The mean difference of the total paired comparison was found to be -0.18 ($t = -2.99, p = 0.003$). A repeated-measures MANOVA was conducted to examine differences in response to order entry across the groups. The results of this analysis are presented below (Table 37) and indicate that significant differences between groups exist. Consequently, the results of the analysis strongly supported H5.

Table 37: Multivariate Tests of Significance

<u>Test Name</u>	<u>Value</u>	<u>F</u>	<u>Degrees of Freedom</u>		<u>F Statistic</u>
			<u>Between</u>	<u>Within</u>	<u>Significance</u>
Pillai's criterion	0.551	55.09	5	225	0.000
Hotteling's trace	1.224	55.09	5	225	0.000
Wilk's lambda	0.449	55.09	5	225	0.000
Roy's gcr	0.551				

Hypothesis H6

The last hypothesis (H6) examined the purchase preferences of industrial purchasing managers under *ceteris paribus* assumptions. Specifically, H6 stipulated that survey respondents would prefer to purchase pioneer products rather than early followers or late entrants given that price, quality, and delivery were equal. Responses were operationalized using a 7-point Likert scale with negative (-3) and positive (+3) anchors. Survey respondents indicated a preference for pioneer products (mean = 0.46) which was statistically significant when tested against the null hypothesis ($t = 4.05, p < 0.000$). Therefore, the results of the hypothesis testing supported H6.

In summary, a total of 14 hypotheses and sub-hypotheses were tested. The results are summarized in the accompanying table (Table 38).

Table 38: Summary of Results of Hypotheses Testing

H1a: Industrial purchasing managers' global attitude should significantly differ toward pioneer brands, early followers, and later entrants.

SUPPORTED

H1b: Specifically, industrial purchasing manager global attitude should be most favorable toward pioneers, followed respectively by early followers and then later entrants.

NOT SUPPORTED

H2a: Industrial purchasing managers overall attitude as calculated by the multiattribute attitude model should significantly differ toward pioneer brands, early followers, and later entrants.

SUPPORTED

H2b: The overall attitude of industrial purchasing managers as calculated by the multiattribute attitude model should favor pioneers over early followers and later entrants.

NOT SUPPORTED

H3a: Industrial purchasing managers believe that pioneer firms have greater levels of technological leadership than do early followers and later entrants.

SUPPORTED

H3b: Industrial purchasing managers believe that pioneer products are of higher relative quality than those of early followers and late entrants.

NOT SUPPORTED

H3c: Industrial purchasing managers believe that pioneer firms offer relatively broader product lines than do early followers and late entrants.

NOT SUPPORTED

H3d: Industrial purchasing managers believe that the use of pioneer components and technologies will enhance the competitiveness of their own firms' products more so than those of early followers and late entrants.

SUPPORTED

H3e: Industrial purchasing managers believe that greater confidence should be placed with firms that have been in business longer within the relevant product category. Consequently, greater confidence should be placed in pioneer firms, followed respectively by early followers and then late entrants.

NOT SUPPORTED

H3f: Industrial purchasing managers believe that early followers are more likely to reduce the firm's dependence on a sole supplier than are later entrants.

NOT SUPPORTED

H4a: Industrial purchasing managers perceptions of pioneer brands will be significantly more favorable on semantic differential dimensions relative to early followers.

NOT SUPPORTED

H4b: Industrial purchasing managers perceptions of pioneer brands will be significantly more favorable on semantic differential dimensions relative to later entrants.

SUPPORTED

H5: For the industrial purchasing manager, pioneer brand image will more closely match ideal firm image than will that of early followers or later entrants.

SUPPORTED

H6: Other things being equal, industrial purchasing managers prefer pioneer brands in terms of product purchase preference.

SUPPORTED

CHAPTER V

CONCLUSIONS

In this chapter the implications, contributions, and limitations of the study are addressed, followed by directions for further research on this topic. A brief summarization of the research direction is presented in order to provide the necessary backdrop for this discussion.

Six major research hypotheses were tested in order to examine the role of attitudinal preference based upon order of entry in the industrial marketplace. These hypotheses draw upon the earlier research of Alpert *et al.* with grocery reseller buyers (1992) and household consumers (1995), but were substantially modified and redesigned to meet the needs of industrial purchasing managers. Multiple approaches were designed to test for the existence of differences in attitudinal preference based upon order of entry. Paralleling these tests were hypotheses designed to examine the nature of attitudinal preference toward entry order. These approaches included a measure of global attitude, a multiattribute attitude model, and a battery of semantic differential items designed to elicit attitude toward order-of-brand entry. The final hypothesis was designed to measure purchase intention based upon *ceteris paribus* conditions.

Discussion

Five major findings emerge from this study of attitude toward order-of-brand entry in the industrial marketplace. The first of these is the recognition that industrial purchasing managers, like their counterparts in consumer markets, do hold different attitudes toward products based upon order of entry. The second major outcome of this study is the revelation that industrial purchasing managers have a more favorable attitude toward early followers than they do toward pioneers. This difference in preference is substantial, highly consistent, and statistically significant. It directly contradicts the findings of earlier attitudinal studies of order of entry in consumer and grocery reseller buyer environments. The third result achieved in this study is the understanding that industrial purchasing managers associate different subjective attributes with different order-of-entry categories and that attitudinal preference may involve trade-offs between product attributes. The fourth contention of this research study is that a variation of self-image/product-image consistency may be at work in the corporate environment. Industrial purchasing managers were found to associate the attributes of pioneership with idealized conceptualizations of their own firm's products. The fifth outcome of this study is the recognition that pioneership under *ceteris paribus* conditions is favorably perceived in the industrial marketplace.

The primary research focus of this study centered on whether or not industrial purchasing managers hold different attitudes toward brands based upon order of entry. Two sub-hypotheses were designed to test this proposition. The first of these, H1a, utilized a global measure of attitude while the second, H2a, was predicated on the results of the multiattribute attitude model. The testing of H1a found that industrial purchasing

managers do hold statistically significant differences in attitude between pioneers and early followers and between early followers and late entrants. These differences were supported by the Tukey procedure applied at the 0.05 level, a relatively conservative test of pairwise comparisons. However, no statistically significant attitudinal differences were detected between pioneers and late entrants. This result was admittedly surprising but may be more easily understood in the context of later hypotheses which focused on the sources of order-of-entry preference. Contemporary perspectives on order of entry have noted the multidimensional nature of this market entry variable. Proponents of contingency theory such as Kerin, Varadarajan, and Peterson (1992) as well as Szymanski, Troy, and Bharadwaj (1995) have recognized the existence of both *first mover advantage* as well as *first mover disadvantage*. An analysis of the multiattribute attitude model as well as the semantic differential batteries revealed the existence of distinct trade-offs based upon order-of-entry considerations. Pioneers, for instance, were found to be associated with attributes such as product distinctiveness, technological superiority, and the ability to enhance competitiveness. Late entrants were defined in terms of higher reliability and lower price. The recognition of the trade-offs implied by these conflicting sets of order-of-entry attributes may have resulted in the lack of statistically significant differences in global preference between pioneers and late entrants. Nevertheless, the evidence supporting differences in attitude between pioneer status and early follower status was critical as it allowed the analysis to proceed.

The second test (H2a) of the existence of attitudinal differences based upon order of entry utilized the multiattribute attitude model. In this case, statistically significant differences in attitude were noted across all pairwise comparisons. Differences were

noted between pioneers and early followers, early followers and late entrants, and between pioneers and late entrants. The outcome of testing H1a and H2a provided support for the existence of differences in attitude based upon order of entry and created the setting for an examination of attitudinal preferences.

Paralleling these tests for differences in attitude, the next set of sub-hypotheses focused on the issue of attitudinal preference based upon order of entry. The issue in these sub-hypotheses was whether industrial purchasing managers preferred pioneers to early followers or late entrants. The first of these, H1b, examined attitudinal preferences arising from the global measure while the second, H2b, relied upon the multiattribute attitude model. Importantly, both sets of data resulted in the same findings. Industrial purchasing managers were consistently found to hold a more favorable attitude toward early followers as opposed to pioneers. This finding is in direct contradiction to the results obtained by Alpert, Kamins, and Graham (1992) in their study of grocery reseller buyers as well as their later work with consumers (Alpert and Kamins 1995).

Corroboration of this seeming paradox may be found in the cross-sectional research conducted by Robinson and Fornell (1985) and Robinson (1988). The first of these research efforts focused on the sources of pioneer advantage in consumer goods industries while the second examined first mover advantage in industrial markets. Both cross-sectional studies utilized samples drawn from the PIMS database. Of potential relevance to the present study was the finding that pioneer advantage is lower in industrial as opposed to consumer markets. Robinson (1988) found that, in industries less than two decades old, the average pioneer advantage over later entrants was 17.16 market share points in industrial markets and 23.56 points in consumer markets. This

disparity in the magnitude of pioneer advantage between industrial and consumer domains may be explained, in whole or in part, by the findings of this dissertation study. Attitudinal preferences for early followers on the part of industrial purchasing managers may reduce the extent of first mover advantage in industrial markets.

One potential explanation of this preference for early followers over pioneers on the part of industrial purchasing managers may lie in the concept of perceived risk. Perceived risk may include components of financial risk, social risk, and professional risk. The level of perceived risk is affected by a number of factors which may be relevant to the issue of order-of-brand entry. Of particular interest here is the relationship between the presence of attribute uncertainty and the level of perceived risk. The attribute uncertainty associated with pioneers is reflected in industrial purchasing managers' perceptions of pioneer product reliability, quality, and conformance. Based upon the semantic differential batteries as well as the multiattribute measures of attitude, industrial purchasing managers expressed a lack of confidence in the pioneer across all of these dimensions. The presence of perceived risk and the potential loss of professional standing within the organization may induce the purchaser to modify, postpone, or completely avoid the purchase of first mover products until the level of attribute uncertainty associated with pioneership is reduced.

The third major finding of this study involved the association of different subjective attributes with different order-of-entry categories. Based upon analyses of the multiattribute attitude model as well as semantic differential batteries, industrial purchasing managers identified the construct of pioneership with technological superiority, product distinctiveness, and the ability to enhance the competitiveness of the

final product. In contrast, early followers were linked to attributes such as higher relative quality, broader product lines, and lower relative price. The association of these advantages with the follower rather than the pioneer was surprising. This finding is at odds with the earlier results of Robinson's (1988) investigation of the sources of first mover advantage in industrial markets. In that study, Robinson reported that pioneers tended to possess higher product quality, broader product lines, and no significant disadvantage in terms of price. Interestingly, Robinson's research design was predicated upon the self-reported perspectives of *sellers* while the present study relied upon the self-reported perceptions of *buyers*.

The fourth major implication of this study was the recognition that idealized firm image more closely resembled pioneer as opposed to early follower image. This finding mirrored the results obtained by Alpert and Kamins (1995) in their study of consumers. This confirmation of earlier findings strengthens the case for a relationship between pioneer image and ideal image. Although this finding runs counter to industrial purchasing managers' expressed preference for early followers, it does speak to the psychological power of pioneership.

The fifth major outcome of this study was the finding that, under *ceteris paribus* conditions, respondents indicated a preference for pioneer products over other order-of-entry categories. These *ceteris paribus* conditions specifically included the absence of those price, reliability, and delivery characteristics which industrial purchasing managers associated with early followers. As was the case with the pioneer image/idealized firm image consistency issue, this result appears at odds with the earlier expressed preference of survey respondents for early followers. This result highlights the importance of such

real world factors as perceived price and reliability in purchasing outcomes. In addition, this finding emphasizes the potential power of first movers under ideal conditions.

Contributions of the Study

Several key contributions to the body of order-of-entry knowledge have been made in this research study. As noted in the introductory chapter, there is a significant gap in the research literature regarding the behavioral implications of order of entry in the industrial marketplace.

As the first study of its kind, the findings of this dissertation have contributed to marketing research's understanding of the role of order of entry in the formation of perceptions, beliefs, and attitudes in an industrial context. Additionally, this study has extended the use of the multiattribute attitude model to the industrial products domain in the context of order-of-entry research. On a fundamental level, one of the more important contributions of this study to marketing knowledge is the realization that industrial purchasing managers do hold different attitudes toward products based upon their order of entry. Differences in attitude based upon order of entry were evident with both the global as well as the multiattribute attitude model. This recognition extends the boundaries of previous research in consumer markets (Alpert and Kamins 1995) and with reseller buyers (Alpert, Kamins, and Graham 1992).

One of the more interesting findings of the study was the lack of support for the

hypotheses (H1b and H2b) that first movers would be more favorably perceived by industrial purchasing managers. Marketing theory has offered a conceptual basis and empirical support for first mover advantage based upon attitudinal research in consumer and reseller buyer domains. The finding that such a relationship does not exist in industrial markets suggests that different attitudinal components are at work in industrial purchasing behavior as opposed to consumer buying behavior. As previously discussed, the presence of perceived risk and the potential loss of professional standing within the organization may influence the attitudes of industrial purchasing managers toward first mover products.

An additional consideration which should be noted is that the purchasing manager is only one of several participants within the buying center. As described by Webster and Wind (1972), the buying center consists of "all those individuals and groups who participate in the purchasing decision-making process, who share some common goals and the risks arising from the decisions" (p. 6). These other participants may include representatives from product design and engineering as well as manufacturing management. Although survey respondents were willing to express their beliefs, perceptions, and attitudes toward new buyclass product components, it should be noted that their influence in the final purchasing outcome may be limited. For instance, Jackson, Keith, and Burdick (1984) found that engineering personnel heavily influence the specification of product components while industrial purchasing managers control the choice of vendor decision. The attitudes of design engineers toward the construct of pioneership may be very different from those of industrial purchasing managers.

Order of entry has traditionally been regarded as a key variable in the formulation

of marketing strategy. Contrary to the expectations raised by earlier attitudinal research with consumers and grocery reseller buyers, marketing management should be aware that industrial purchasing managers hold consistently more favorable attitudes toward early follower rather than pioneer brands. This sense of skepticism regarding the pioneer product was detected in measurements of global as well as multiattribute attitude. Based on an analysis of the multiattribute attitude model as well as the results of the semantic differential, industrial purchasing managers' concerns with pioneer products appear to be focused on issues of relative quality, price, conformance, and reliability. Marketers of pioneer products in the industrial domain may be able to assuage some of these concerns through the use of experience curve pricing, extended warranties, and quality assurance programs such as ISO 9000. This issue was highlighted in the findings of the *ceteris paribus* hypothesis, H6, where industrial purchasing managers reported a favorable attitude toward the pioneer brand when the aforementioned concerns were alleviated.

From the perspective of marketing management, this study has also demonstrated that industrial purchasing managers perceive the pioneer product to be more distinctive and technologically sophisticated and these beliefs may be used to guide the promotional strategy of the firm. An additional source of advantage for marketers of pioneer products is the realization that industrial purchasing managers believe that pioneer suppliers are likely to enhance the competitiveness of their own firms' final products, a belief which is heavily weighted in terms of importance. Indeed, one of the potentially practical outcomes of this research study is the recognition that industrial purchasing managers weigh different product attributes associated with order of entry differently. The highest importance weightings were assigned to relative quality (6.56), the ability to enhance

competitiveness (6.43), and technological leadership (5.78) while the least important were associated with business longevity (4.02) and breadth of product line (4.62). Marketing management may be able to influence purchasing outcome decisions by emphasizing or de-emphasizing buyer weightings of these attributes.

While the general findings of the study do not support a claim of first mover advantage based upon the attitudes, beliefs, and perceptions of industrial purchasing managers they offer little consolation for marketers of late entrant products. Disadvantage in the form of a less favorable attitude is associated with late market entry by virtually every measure used in the survey. This less favorable attitude toward later entrants can be seen in the results of the semantic differentials as well as the global and multiattribute attitude models. The results of this research study simply do not associate a lack of product innovativeness with market success.

The results of this study do represent a source of encouragement for marketers of early follower products in the industrial marketplace. As previously discussed, early follower status was perceived more favorably by industrial purchasing managers based upon the global, multiattribute, and semantic differential approaches to attitude toward order of entry. The key elements which fall out of the analysis of multiattribute attitude are the advantages accorded early follower status on the dimensions of higher relative quality, relatively broader product lines, business longevity, and the ability to reduce supplier bargaining leverage. Marketers of early follower products may be able to exploit these attitudinal differences through a promotional strategy emphasizing these dimensions. Higher relative quality was perceived as the most important of the six product attributes with a mean score of 6.56 out of a potential 7.00. The other three

dimensions on which the early follower enjoyed an attitudinal advantage were considered significantly less important. A potential strategy for marketing management may be to influence industrial purchasing managers' relative weighting of these three attributes. The results of the semantic differential analysis suggest that early followers are perceived more favorably on the dimensions of relative quality, relative price, conformance quality, and reliability. All of these dimensions represent potential areas around which to construct promotional themes.

Limitations of the Study

The findings of this study are limited on at least four dimensions. First, the scope of industrial purchasing activity is large. Gross, Banting Meredith, and Ford (1993) have described seven different acquisition categories which make up the domain of industrial purchasing. These categories include the procurement of capital equipment, accessory equipment, component parts, process materials, maintenance and operating supplies, raw materials, and business services. Bearing the dissertation focus in mind, the findings of this study are limited to a single category of industrial products. This category is made up by those component parts and assemblies which are incorporated into the buyer's final product. Consequently, any generalizations of the results to other industrial purchasing categories must be made with caution.

The second limiting dimension of this study concerns the buyclass typology of *new task*, *modified rebuy*, and *straight rebuy* suggested by Robinson, Faris, and Wind

(1967). Because the focus of this study involves attitudes toward order of entry within new product categories, this dissertation has confined its observations to the *new buy* industrial purchasing situation. This purchasing situation is characterized by higher levels of buyer involvement and consequently, extended search and consideration. The different conditions found in the other buyclass situations may translate into different beliefs, perceptions, and attitudes toward order of entry.

A third consideration regarding the limitations of this study is its reliance upon the self-reported beliefs, perceptions, and attitudes of industrial purchasing managers. While the beliefs, perceptions, and attitudes of the individual represent an important component of industrial buying behavior, other variables also play a critical role in determining purchasing outcomes. Sheth (1973) as well as Webster and Wind (1972) have recognized the multitude of determinant influences upon industrial purchasing decisions. Both of these theoretical models of industrial purchasing behavior accord a role to environmental determinants, organizational determinants, interpersonal determinants, as well as firm-specific and product-specific factors. The industrial purchasing manager represents only one of the participating roles within the purchasing committee. Other participants may include representatives from product design and engineering, manufacturing management, and marketing management. The influence of these other members of the purchasing committee, or buying center, may be at their highest when considering components and assemblies used in the firm's final product under new buy class conditions. Their beliefs, perceptions, and attitudes toward pioneer products may be far different from those of the industrial purchasing managers which were the subject of this study. Indeed, one of the most important limitations of the study

is that the procurement of component parts and assemblies under new buy class conditions may represent a set of circumstances under which purchasing manager influence on procurement outcome is at its weakest.

A final limitation to the scope of this investigation is the research setting itself. The research sample was drawn from a relatively narrow range of industrial activity encompassing the manufacture of industrial capital equipment (SIC 35), consumer and industrial electronic equipment (SIC 36), transportation equipment (SIC 37), and measurement instrumentation (SIC 38). Participants within the study consistently characterized their firms as global and competition within their industries as very intense. While these four Standard Industrial Classifications embody important aspects of the contemporary manufacturing economy, the findings of this study may not be appropriate to other more traditional portions of the industrial sector. Consequently, the results of the study should be confined to those industries contained within the research setting.

Future Research

Research studies often raise as many questions as they answer. An important outcome of this study is the recognition of the need for further investigation into the behavioral sources of first mover advantage. One of the most glaring of these research needs is additional work designed to explore the differences in attitude toward order of entry revealed in this study and those uncovered in previous studies of consumer markets (Alpert and Kamins 1995) and grocery reseller buyers (Alpert, Kamins, and Graham

1992). The central research question implicit in this research suggestion is: Why do industrial purchasing managers have a more favorable attitude toward the early follower while other categories of respondents (i.e., consumers and grocery reseller buyers) have a more favorable attitude toward the pioneer?

One of the limitations of this study is its reliance upon the beliefs, perceptions, and attitudes of purchasing management to the exclusion of other functional roles. Other participants within the buying committee representing functions such as product design and engineering as well as manufacturing management may hold very different attitudes toward potential suppliers. Global and multiattribute attitudes toward order of entry and particularly the role of the pioneer may shift when the research sample is composed of industrial designers rather than industrial purchasing managers. The weighting of the attributes which make up the multiattribute attitude model may also change due to the functional orientation of the research sample. For instance, product designers may more heavily weigh product attributes such as technological leadership and the ability to contribute to competitive advantage. On the other hand, manufacturing management may be more interested in attributes such as the relative quality and reliability of the supplied components. Responses to the semantic differential portions of the survey instrument may also shift due to the functional specialty of the respondents. Further research into the attitudes of these other functions within the buying committee may enrich our understanding of the complex forces at play in determining advantage based upon order of entry.

An additional avenue of future research lies in cross-cultural studies of industrial purchasing manager attitudes toward order-of-brand entry. The classic treatment of

cultural differences based upon national origins was developed by Geert Hofstede (1983).

This model identified four dimensions of national culture: power distance, masculinity versus femininity, individualism versus collectivism, and uncertainty avoidance.

Hofstede conceptualized uncertainty avoidance as the extent to which different cultures socialized their members to tolerate ambiguity and uncertainty in the decision-making environment. Implicit in the construct of uncertainty avoidance is the readiness with which different cultures accept risk or resist change. For instance, the prevailing cultures of countries such as Japan, Greece, Guatemala, and Portugal were characterized as high on the uncertainty avoidance index, indicating that decision-making in circumstances of ambiguity was resisted. On the other hand, the defining cultures of countries such as Singapore, Hong Kong, Sweden, and the United States were profiled as low on the uncertainty avoidance dimension, suggesting a greater willingness to act in conditions of environmental uncertainty. Hypothetically, a more favorable attitude toward and a greater willingness to adopt pioneer products would appear to be associated with low uncertainty avoidance cultures while a preference for early followers or late entrants might be characteristic of high uncertainty avoidance cultures. Certainly, cross-cultural attitudinal research represents a potentially productive area for order-of-entry investigation.

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APPENDIX

Figure II: General Model of OBB

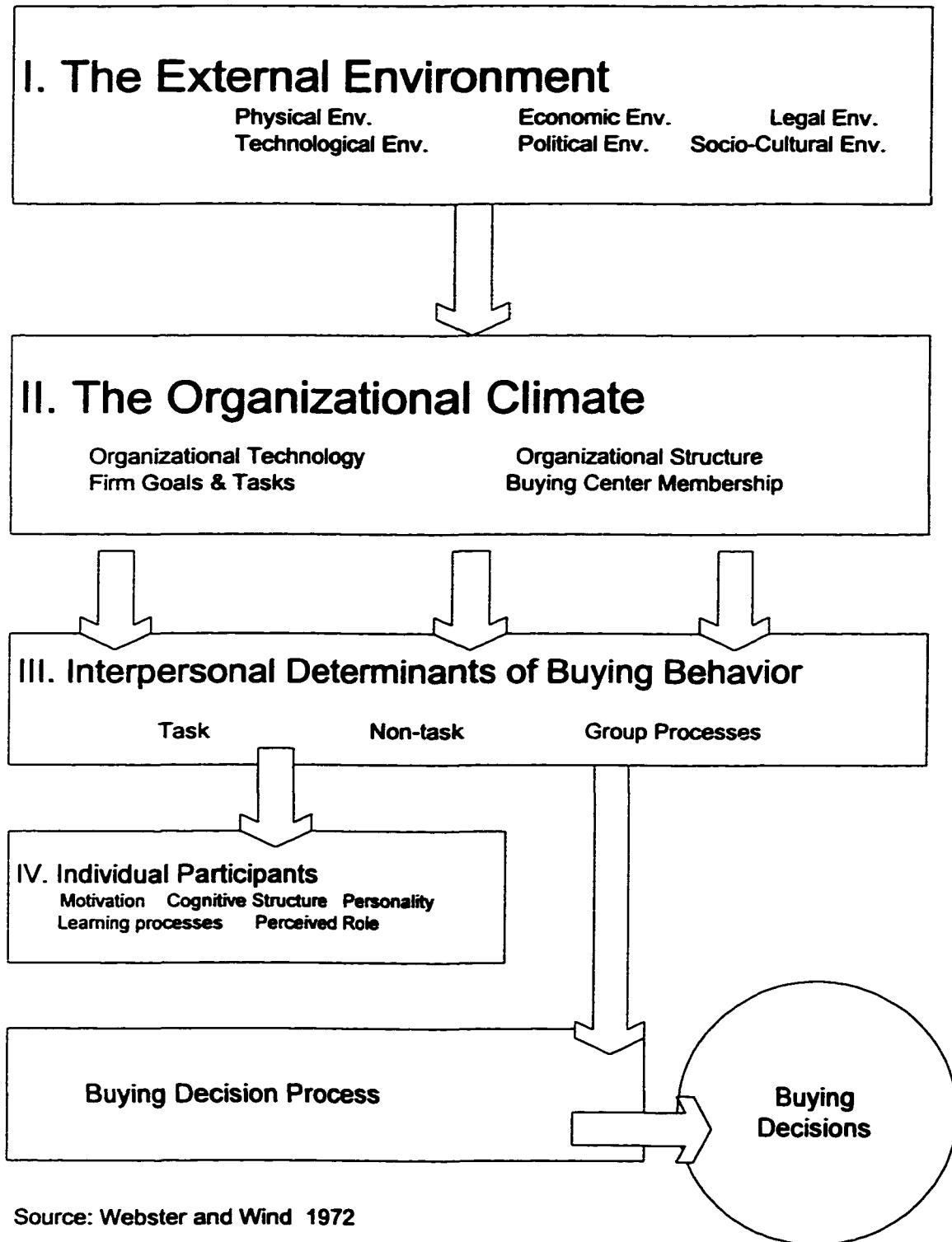
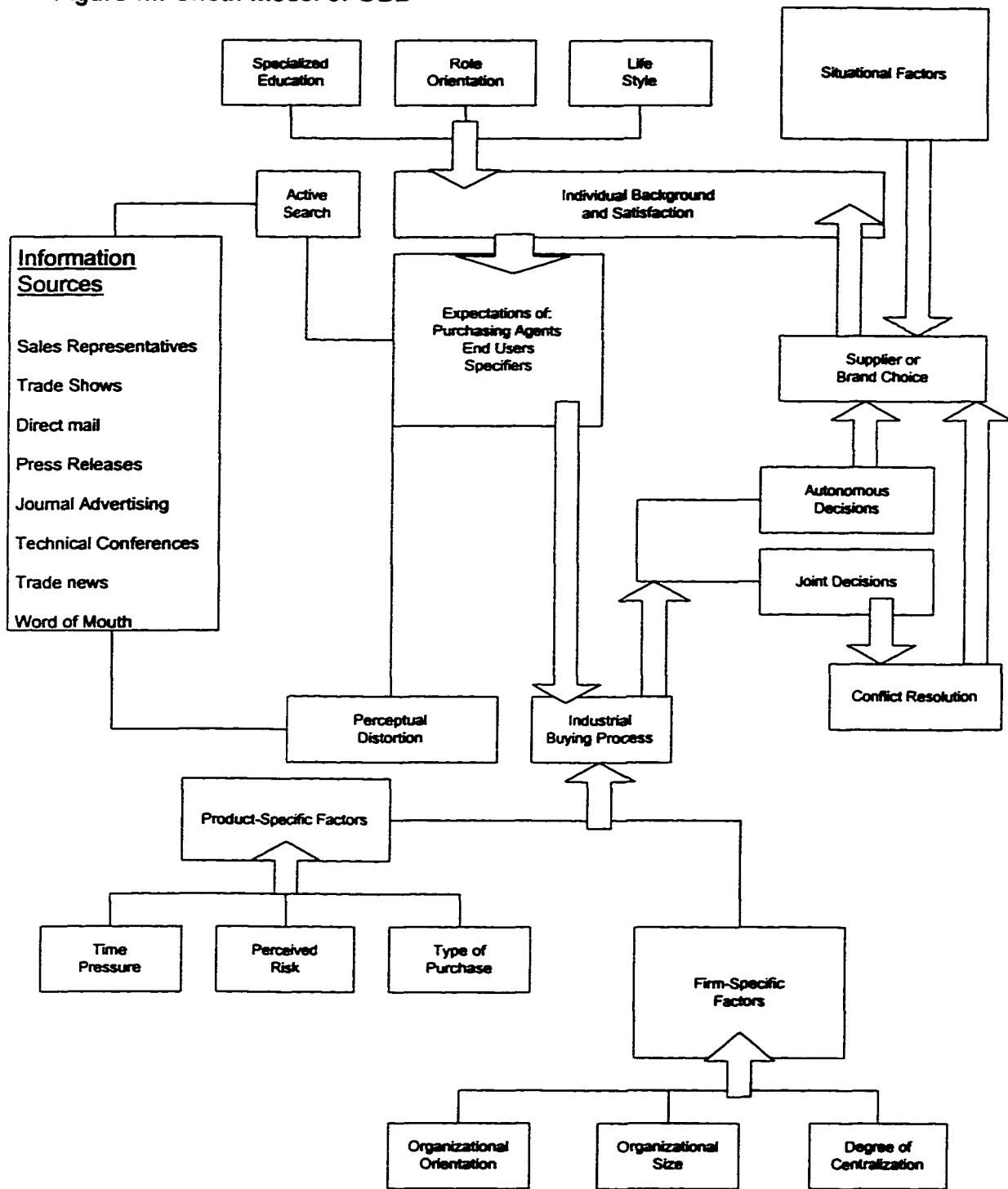
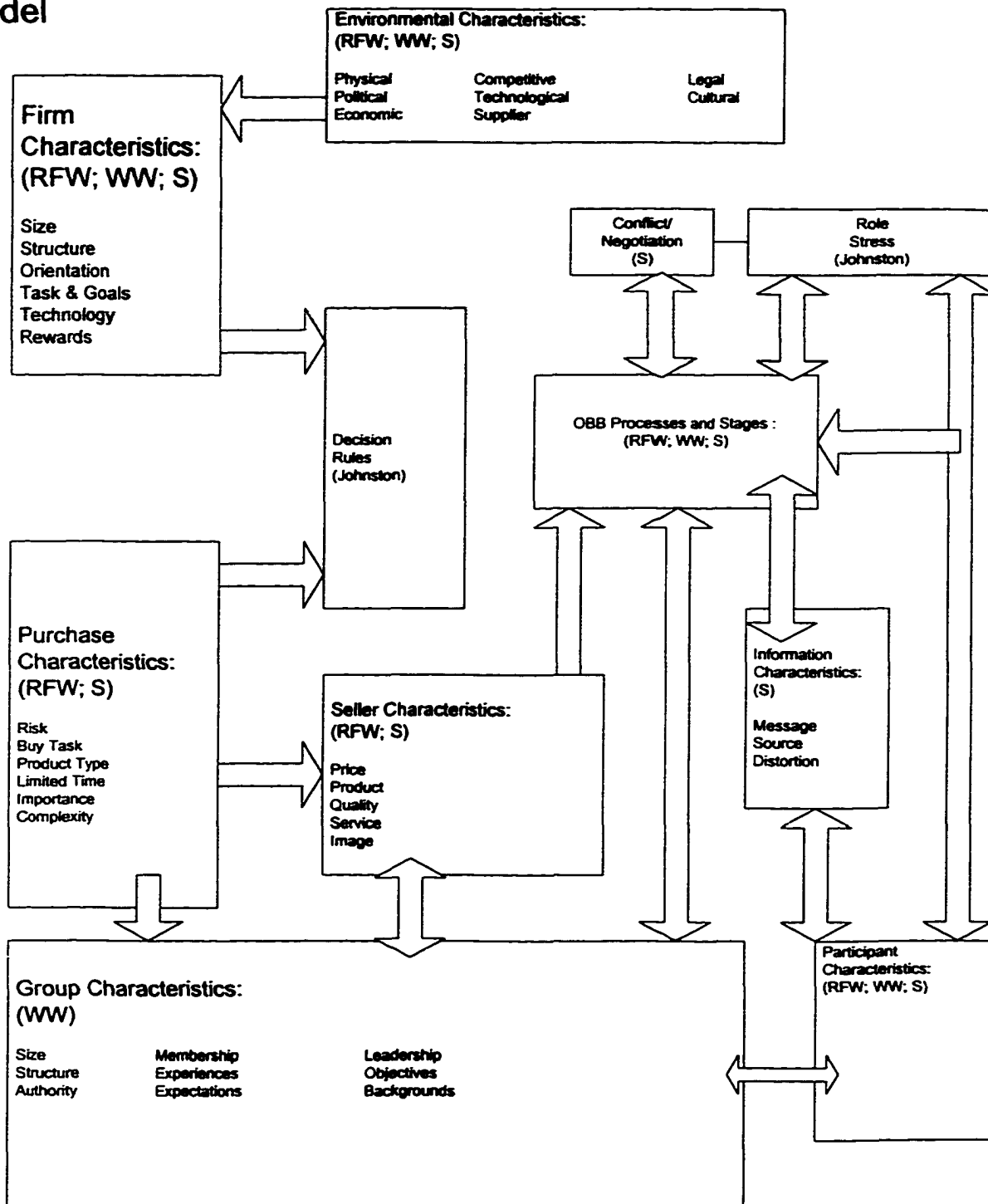


Figure III: Sheth Model of OBB



Source: Sheth 1973

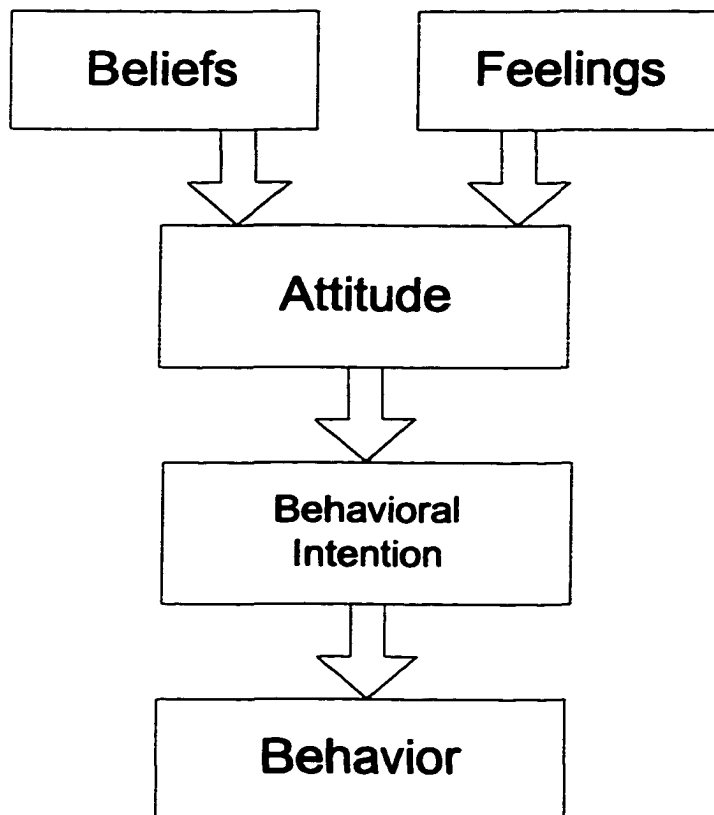
Figure IV: Integrated OBB Model



Key: RFW = Robinson, Faris, and Wind 1967
 WW = Webster and Wind 1972
 S = Sheth 1973

Source: Johnston and Lewin 1996

Figure V: Attitudinal Model



**Source: Engel, Blackwell,
and Miniard 1995**

Exhibit A: Questionnaire

PURCHASING SURVEY

Dear NAPM Member:

This is to assure you once again that all your responses will be held in strict confidence. As you read the survey questions, please provide the first response that comes to mind. Your responses to all of the survey questions are important to the findings of this research project which is investigating purchasing strategy.

➡ Please think of **Materials and Components** commonly purchased by your division when responding to all items in this survey. **Materials and Components** are defined here as only those items that go directly into and become a part of the final product manufactured by your division.

As none of the response alternatives provided are inherently good or bad, please feel free to give us your frank and candid response to each research question.

A. The division's market domain. (Check one by an X)

Global National Regional

Degree of competition faced by the division:

Extremely low Intense

Number of employees in the division _____

Annual sales of the division in 1997 _____

Years in purchasing: _____ Years with the firm: _____

B. The following questions relate to your beliefs and attitudes towards pioneer and non-pioneer products.

Pioneer products: The first product of its kind.

Early followers: The next brand (or brands) to appear within this product category and bear a substantial similarity to the pioneer brand.

Late entrants: All brands bearing a substantial similarity to the pioneer which enter the market after it has been established.

1. Our overall attitude toward purchasing pioneer brands for the use of our firm is:

Extremely negative Extremely positive

2. Our overall attitude toward purchasing early follower brands for the use of our firm is:

Extremely negative Extremely positive

3. Our overall attitude toward purchasing late entrant brands for the use of our firm is:

Extremely negative Extremely positive

C. Please indicate your general perceptions of pioneer brands based on the following characteristics:

Poor quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High quality
Very distinctive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not very distinctive
Useless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Useful
Good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bad
Expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inexpensive
Important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unimportant
Conforming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not conforming
High tech	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low tech
Unreliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reliable
Simple	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complex
Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exciting
Sophisticated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unsophisticated
Superior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inferior

D. 1. How important is it for a supplier to be a technological leader?

Not very important Very important

2. How important is it for a supplier to provide relatively higher quality?

Not very important Very important

3. How important is it for a supplier to provide a relatively broad product line?

Not very important Very important

4. How important is it that a supplier contribute to the competitive advantage of your firm's products?

Not very important Very important

5. How important is it to work with a supplier who has been in business longer than its competitors?

Not very important Very important

6. How important is it to your firm to have more than one supplier for a particular kind of product?

Not very important Very important

E. Please indicate your general perceptions of early follower brands based on the following characteristics:

Poor quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High quality
Very distinctive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not very distinctive
Useless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Useful
Good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bad
Expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inexpensive
Important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unimportant
Conforming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not conforming
High tech	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low tech
Unreliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reliable
Simple	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complex
Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exciting
Sophisticated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unsophisticated
Superior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inferior

F. 1. How likely is it that products supplied by a pioneer will be technologically advanced?

Not very likely Very likely

2. How likely is it that products supplied by an early follower will be technologically advanced?

Not very likely Very likely

3. How likely is it that products supplied by a late entrant will be technologically advanced?

Not very likely Very likely

4. How likely is it that products supplied by a pioneer will be of higher relative quality?

Not very likely Very likely

5. How likely is it that products supplied by an early follower will be of higher relative quality?

Not very likely Very likely

6. How likely is it that products supplied by a late entrant will be of higher relative quality?

Not very likely Very likely

7. How likely is it that a pioneer will supply a relatively broader product line?

Not very likely Very likely

8. How likely is it that an early follower will supply a relatively broader product line?

Not very likely Very likely

9. How likely is it that a late entrant will supply a relatively broader product line?

Not very likely Very likely

10. How likely is it that components sourced from a pioneer will contribute to your firm's competitive advantage?

Not very likely Very likely

11. How likely is it that components from an early follower will contribute to your firm's competitive advantage?

Not very likely Very likely

12. How likely is it that components from a late entrant will contribute to your firm's competitive advantage?

Not very likely Very likely

G. Please indicate your general perceptions of late entrant brands based on the following characteristics:

Poor quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High quality
Very distinctive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not very distinctive
Useless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Useful
Good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bad
Expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inexpensive
Important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unimportant
Conforming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not conforming
High tech	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low tech
Unreliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reliable
Simple	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complex
Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exciting
Sophisticated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unsophisticated
Superior	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inferior

H. 1. How likely is it for your preferred supplier to have been in business longer than all of its competitors?

Not very likely Very likely

2. How likely is it for your preferred supplier to have been in business longer than many of its competitors?

Not very likely Very likely

3. How likely is it for your preferred suppliers to have been in business for a shorter period than most competitors?

Not very likely Very likely

4. How likely is it that an pioneer product will lessen your dependence upon a sole supplier?

Not very likely Very likely

5. How likely is it that a early follower product will lessen your dependence upon a sole supplier?

Not very likely Very likely

6. How likely is it that a late entrant product will lessen your dependence upon a sole supplier?

Not very likely Very likely

I. Other things such as price, quality, and delivery being equal, your firm would prefer to purchase pioneer brands rather than early followers or late entrants:

Agree Disagree

J. How would you like to see your firm's products described in *The Wall Street Journal*?

Very distinctive distinctive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not very distinctive
Important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unimportant
Conforming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not conforming
High tech	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low tech
Simple	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complex
Dull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exciting
Sophisticated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unsophisticated

Exhibits B and C: Cover Letters

September 20, 1998

Dear NAPM Member:

This is a request inviting you to participate in a **research study on purchasing** being conducted under the joint sponsorship of Gettysburg College and Old Dominion University.

The purpose of this research study is to investigate the beliefs and attitudes of industrial purchasing managers toward several aspects of industrial marketing strategy. The major benefits of this research project are two-fold. The study aims to uncover the means to improve the overall effectiveness of purchasing and to build a foundation for further research on the **strategic role of purchasing** in the competitive success of the firm. This research project is being undertaken by a **fellow member of the NAPM**.

The research benefits of this study very much depend on your response to our questionnaire. **We promise to keep all of your responses strictly confidential.** We believe that completing this survey may call for approximately ten minutes of your valuable time. We are confident of your support and look forward to early receipt of the completed survey from you. **A postage-paid return envelope has been enclosed for your convenience.**

Thanking you for your valuable time and support,

Dr. John B. Ford, Ph.D.
Professor
Department of Marketing and Management
Old Dominion University

Howard G. Ling, NAPM
Instructor
Department of Management
Gettysburg College

P.S.: The findings of this research study will be appearing in a forthcoming issue of *The International Journal of Purchasing and Materials Management*.

October 21, 1998

Dear NAPM Member:

A few weeks ago we approached you for help and assistance in connection with our **research study on purchasing** and forwarded a survey for your completion. This study addresses some of the **strategic issues** encountered by executives in manufacturing industries. As indicated earlier, the benefits of the study are **two-fold**. The study aims to uncover the means to improve the overall effectiveness of purchasing and to build a foundation for further research on the **strategic role of purchasing** in the competitive success of the firm.

We eagerly await the completed survey from you. Probably because of your busy schedule and the demands on your time, you may not have had a chance to respond to this research survey. We understand that you will be investing your precious time to help us carry out this research, and we greatly appreciate it. **Your response is extremely crucial to the completion of the study.** We can neither understate this fact nor fail to thank you enough for your help and support. We are confident that you will give us your vital backing by mailing back the completed survey as soon as possible.

For your convenience an additional copy of the **Purchasing Survey** is enclosed. Please mail back the completed survey as soon as possible. We once again appreciate and acknowledge the contribution by you in providing us your valuable help, time, and support. We look forward to sending the summary of our findings to you.

Sincerely,

Dr. John B. Ford, Ph.D.
Professor
Department of Marketing and Management
Old Dominion University

Howard G. Ling, NAPM
Instructor
Department of Management
Gettysburg College

P.S.: The findings of this research study will be appearing in a forthcoming issue of *The International Journal of Purchasing and Materials Management*.

VITA

Howard G. Ling received the B.A. in English Literature from Davidson College, the M.B.A. from The University of North Carolina at Charlotte, and completed the Ph.D. in Marketing from Old Dominion University. His initial professional assignment was as a business journalist at *Furniture Production Magazine*, a trade publication for management, production, and design executives in the furniture industry. As Assistant Editor of this publication, Ling wrote, edited, and published more than 30 articles on various aspects of furniture design, production, and marketing. Ling later founded and managed The Ling/Martin Group, a manufacturers representative agency located in San Francisco and serving the Northern California market. Ling/Martin Group represented the interests of 10 contract furniture manufacturers including firms from the United States, Canada, Yugoslavia, and Italy. During his years as a manufacturers representative, Ling was able to observe at first hand the effect of order of entry on the attitudes, perceptions, and beliefs of industrial purchasing managers. Professor Ling has taught at Old Dominion University and Gettysburg College, and is currently a Visiting Assistant Professor at St. Andrews Presbyterian College.